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THINKING AND DESIGN*

**MASTER DISSERTATION**

# **BUSINESS MODEL FOR DESIGN THINKING**

*A CASE STUDY FOR THE EVOLUTION 6<sup>2</sup> MODEL*

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# Abstract

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This study aimed to extend the existing knowledge and practices related to Design Thinking (DT) models exploitation. Analysing the theoretical background of the topic, it was evident that DT models have different ways of commercialisation. This analysis helped to develop a strategy for the commercialisation of the Evolution 6<sup>2</sup> Model, developed by Katja Tschimmel, and to apply this strategy based on different types of innovation. The technology-to-product-to-market framework has been adapted for the research objectives and turned into knowledge-to-product-to-market. The interviews with CEO's of innovative companies helped in the understanding of the motivations, challenges, and attitudes, that are important for the innovative business environment. Therefore, this research has successfully developed the complementary business model for Evolution 6<sup>2</sup>.

## Keywords

*Design Thinking, Business Model, Types of Innovation, Evolution 6<sup>2</sup> Model, Process Model*

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# I. Introduction

Over that last few years Design Thinking (DT) proved to be an effective way of approaching problem-solving and innovation processes in various industries including such fields as education, IT, medical and business environments. Although this approach had been born and further developed in a creative design environment, it had been proved that some of these activities could be valuable for other fields. Design Thinking could be defined as “a human-centered, creative iterative and practical approach to finding innovative ideas and solutions (Brown, 2008). This approach also allow practitioners to think in new perspectives and future possibilities (Tschimmel, 2012).

The Evolution 6<sup>2</sup> Design Thinking Model has been developed by Katja Tschimmel between 2012 and 2015, as result of extensive and grounded research in creative environment. The model has the potential to help to deal with new open and complex problems they are facing in the modern world. Through different stages of the innovation process, covered in the model, a wide range of goals can be reached. The aim of this research is to clearly identify the capabilities of the model and to find the optimal possible way to apply it toward business’s needs.

The purpose of this research is the development of an exploitation model for the Evolution 6<sup>2</sup> Design Thinking model in order to bring a new value to its clients. By using a case study approach, the conducted research will allow to develop a business model to be implemented in the MINDSHAKE company context. This will help to understand better the company values and objectives, follow the inner processes and understand the client’s needs. Combination of these factors allow to apply the all information in the researcher’s work and allow MINDSHAKE to apply the developed model in their future work and business.

## 1.1 Motivation

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The motivation of this work comes from several dimensions. One of the sources of interest toward this topic was the researcher’s background: having a Master Degree in Cognitive Psychology with a deepen knowledge in human-computer interaction combined with two years of work experience in

design studio as a project manager. Combination of these academical and professional experiences sparked the interest towards innovative and design-driven projects environments and brought curiosity towards the Design Thinking topic. Professor Alexandra Xavier proposed to contact Katja Tschimmel, founder of the company MINDSHAKE, in order to explore the Design Thinking concepts and make the result of the research more applied.

On the other hand, Katja Tschimmel has been looking for new ways of commercialisation of the Evolution 6<sup>2</sup> model, that had been used widely during the company practice. Katja Tschimmel has years of creative and Design Thinking linked experience and suggested to team up for the exploitation strategy development. This cooperation resulted into an internship proposal and help researched deeper understand the Evolution 6<sup>2</sup> model through the MINDSHAKE working environment. Summing up the motivational origins towards the exploitation strategy for Evolution 6<sup>2</sup> model came from the mutual interest and curiosity of the researcher and the company, where the researcher had been assigned to accomplish internship. This co-creation approach was born from the aspiration to use all the capabilities of the model and make it more business applied and oriented.

## 1.2 Objectives

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The main goal of this research is the development of a business model for the Design Thinking Evolution 6<sup>2</sup> model, related to the core business challenges inside the organisation in order to bring more value to it, and to clear identify opportunities to be used by MINDSHAKE's consulting purposes, having in mind the vision and mission of the company.

### Specific objectives

1. Explore and understand the concepts of design thinking, knowledge, technology, business model and technology-to-product-to-market framework;
2. Identify different types of innovation;
3. Explore the Evolution 6<sup>2</sup> model and current business model for its exploitation;
4. Adapt the technology-to-product-to-market framework for the Evolution 6<sup>2</sup> model;
5. Develop a new complementary business model for the Evolution 6<sup>2</sup> model aligned with market needs, having in consideration MINDSHAKE's specific context.

## 1.3 Research questions

- I. Is there a difference between technology and knowledge exploitation?
- II. How to use the technology-to-product-to-market framework (TPM) for a process model exploitation?
- III. How to develop an exploitation strategy for the Evolution 6<sup>2</sup> DT process model?

## 1.4 Methodology

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The remainder of this research is organised as follows: first the introduction, research objectives and questions are proposed. In the second chapter are described the literature areas that are relevant to the research questions, namely the terms “knowledge”, “technology”, “technology-to-product-to-market framework” and “business model”. Also different types of innovation will be introduced. For the better understanding of the topic, five Design Thinking concept are introduced and 5 DT models are analysed and compared. In the third part of the thesis the empirical setting for this research is presented. The case study approach was used for collecting and analysing data. The case study method has been defined by Robert K. Yin as an “empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used” (Yin, 1984, p. 23). Then the findings are discussed and the set of propositions is presented. After the case study, the conclusions, study’s limitations and directions for further research will be presented.

The Portuguese based Design Thinking consultancy MINDSHAKE were chosen as the empirical setting for this research. Considering the exploratory aims of this research, an inductive case study approach had been chosen. Inductive studies allow to generate new theory emerging from the collected data according to research goals and objectives. The applied context has been chosen in order to: (1) investigate a particular context the company MINDSHAKE and achieve a specific task (develop a complementary business model); (2) work towards generating a certain, pre-defined outcome and possibly implement it later.

Data were collected through: (1) literature review and analysis; (2) desk research (websites, reports, etc.); (3) in-depth interviews with MINDSHAKE founder Katja Tschimmel; (4) observation (events, behaviours and artefacts); (4) interviews with design-driven companies employees.

## II. Theoretical Concepts

The main goal of literature review is to identify what is known and not known about a certain topic. Keeping this in mind, scientific articles, published from 1996 to 2016 in Scopus (a vast online database of abstracts and citations with peer-reviewed literature), were examined. The search was made based on the selected key words “Design Thinking”, “Types of Innovation” and “Business Model”. Also concepts “knowledge”, “technology” and “technology-to-product-to-market framework” are introduced. As a result, 23 papers had been selected, read and analysed in order to find a literature gap and gain a deeper understanding of the key concepts, related to the research question. All articles and books were further systematised into a table, as shown in Appendix A.

### 2.1 Design Thinking — An Introduction

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Over the last decades design effected contemporary life in four different broad dimensions: (1) symbolic and visual communications; (2) material objects; (3) activities and organised services and (4) complex systems that include various activities such as living, playing, working and learning (Buchanan, 1992). All of these areas contribute, connect and integrate useful knowledge from different areas in a ways it was suitable for purposes of present.

”

*In fact, signs, things, actions and thoughts not only interconnected, they also interpenetrate and merge in contemporary design thinking with surprising consequences for innovation. These areas suggest the lineage of design's past and present, as well as point to where design is headed in a future.*

— Richard Buchanan

Design as a discipline come through transformation and become seen more as “communication, construction, strategic planning and systematic integration” (Buchanan, 1992). Being by its nature a flexible area, the design keeps expanding in its meanings, definitions and connections, creating unexpected dimensions for different fields, integrating business, technological and human factors.

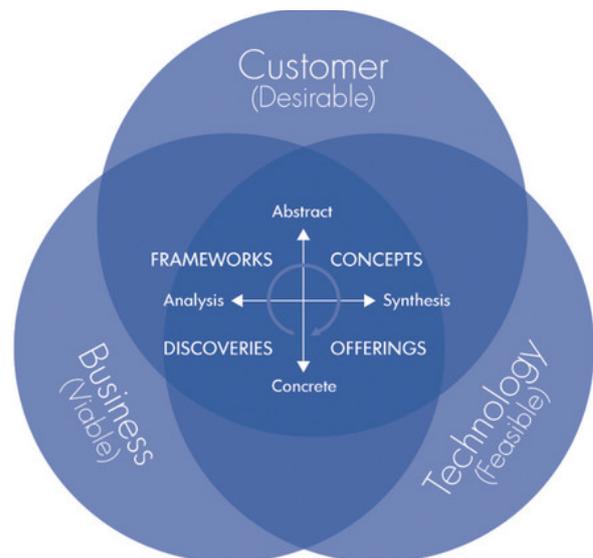
Although the term “Design Thinking” had been introduced by Rowe as the title of his book at 1987, the Design Thinking (DT) approach started to gain popularity quite recently. The overall business landscape changed and Design Thinking methods become a necessity among different industries when the need to innovate for a competitive advantage emerged. At the same time, the more the

concept “innovation” was changing, the more increase the potential, methods and areas of implementation of Design Thinking. Tim Brown, president and CEO of IDEO, one of the first companies that started to practice design-related tools for different fields, defines **Design Thinking** as “human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success.”

This approach is useful for any type of organizations in order to deal with open, complex problems in many different professions and industries, most notably in Information Technology (IT) and Business area (Dorst, 2011).

The iterative nature of Design Thinking processes meets the current requirement towards the business needs. Roger Martin in his book “The Design of Business” (2009) stated that “innovation is about seeing the world not as it is, but as it could be; it’s about exploring the really „wicked problems“ whose solutions can’t be found in past experience or proven by data”. DT allows not only to adjust the actual issues that companies might face, most importantly it also allows to form the desirable scenarios for the future development. Most of the industries already realized that the performance of any organization will depend on the holistic vision of society in which it is functioning, so the human-centered approach is essential. This is how Design Thinking could bring the value to the companies.

Moreover, it is considered that thinking like a designer can transform the way organizations develop products, services, processes, and strategy and could be an effective way for problem solving. As a result, different Design Thinking models appear in order to make the whole innovation process more systematised. Although most of them based on combining divergent and convergent thinking, the models have different origins and include different stages and tools. Divergent thinking is considered to be a way of thinking that are used to generate new ideas by exploring many possible solutions. This type of thinking is the most common for the early stage of creative analysis of any specified task. Following further the creative process, that requires narrowing down to the most suitable and appropriate ideas and pick the best one, helps the convergent thinking. Convergent thinking is oriented toward deriving the single best (or correct) answer to a clearly defined question. The combination of both ways of thinking is helpful in order to address a vast range of possible challenges that organizations might have.



*Figure 1: Iterative nature of DT combining convergent and divergent approaches with analysis and synthesis.*

*Source Keleey (1993), Owen (1993)*

## Business Model for Design Thinking — A Case study for the Evolution 6<sup>2</sup> model

Whereas the phenomenon of Design Thinking is proved to be effective, there is still a lack of awareness about its advantages and contribution to the business. Most commonly, when executive managers think about DT, they still refer to it more as product and service design, and less as a mindset. For a long time, Design Thinking was considered to be a discipline for chosen creative fields, while currently, the situation changes: the application of DT happens not only in design-related fields, but also to all kinds of problems such as healthcare, social security, global warming and so on.

Understanding culture and context, in which businesses operate, allow Design Thinkers to emphasise human needs and, as a result, bring more value to customers. First highlighted by Peter Drucker, “the founder of modern management”, that it is important to look at the customer in a holistic way — not from the perspective what is convenient for producers, but what is necessary for customers. Management is not a completely analytical exercise — and lots of managerial activities involve creating something that is not yet existing. To come up with an innovative solution the analytical, or convergent, skills are required, but in most cases they are not enough. Divergent thinking is the type of thinking that is required for solving a new problem or abstract problem or task that has many possible solutions, or outcomes. For successful business execution required both types of thinking and DT methods are developed keeping this combination in mind.

The next big impact of DT is the principle of “learning by making” or, as Tim Brown described it “instead of thinking about what to build, building in order to think”. In order to speed up the process of innovation, DT proposes to create rapid prototypes and put it out to the customers. Instead of investing internally in a product and service and only after development bringing it to the market, without a clear understanding of user’s needs. Design Thinking proposes an iterative approach towards the whole process. This reconciliation will help companies to understand strengths and weaknesses of their solution. This human-centered shift in approaching customers establishes new relationships between consumers and producers and engage people in more meaningful experiences. Design Thinking brings more forms of value both to companies and to their customers: not only simply cash but also more involvement and appreciation.

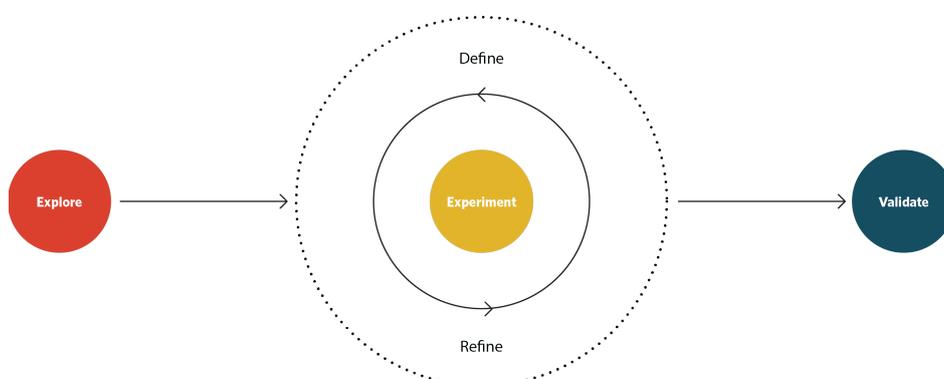


Figure 2: Design Thinking process. Source MU/DAI (2016)

Over the years it was considered that the main source of innovation inside the companies is brilliant minds of CEOs. Recently it became evident, that the innovation process could be guided and stimulated through various techniques in all organisations. That is why Design Thinking could be an effective strategy for any types of businesses in order to bring fresh, innovative approaches toward products, processes and future scenarios development.

## 2.2 Knowledge versus Technology

### 2.2.1 Knowledge

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Most of the companies consider intellectual capital as a significant part of the company's assets. This approach could be referred as a base for a knowledge economy where a significant part of organization's value might consist of intangible assets. Knowledge could be seen as a part of intellectual landscape within the companies and as any assets require a thought-out managerial approach. Sharp argues that it is hard to come up with a unified definition of knowledge because it is "something that is multifaceted, changes over time, varies according to the context in which it is being considered, and once articulated, it can be something that is shared and reflected upon" (Sharp, 2007). On the other hand, Michael H. Zack considers that "knowledge can be viewed both as a thing to be stored and manipulated and as a process of simultaneously knowing and acting" (Zack, 1999). In order to succeed and make knowledge a part of company's intellectual assets, companies should manage knowledge in a combined manner: as objects and as processes.

Most popular knowledge classification refers to knowledge as tacit or explicit and had been introduced by Nonaka and Tacheuchi in 2001. Tacit knowledge is considered to be the one that is subconsciously understood, subjective and intuitive; it is difficult to store and articulate and usually communicated through individual's shared experience, conversations or storytelling. On contrary, explicit knowledge is considered to have more tangible nature which means that it could be shared, transferred, taught or discussed. Even removed from the original company's context explicit knowledge could be used and further developed. Although some authors consider that explicit knowledge plays a significant role in organizations and perceived as one of the most valuable factors for the knowledge economy (Zack, 1999), the tacit knowledge that is conducted in individuals or departments is extremely valuable for companies innovation processes.

Knowledge as a process is a more dynamic system, "a flow of interacting changes that taking place in the people involved in a learning process" (Garavelli, Gorgoglione and Scozzi, 2002). Inside the companies it is important not to perceive knowledge as a static pool, but rather as a source constantly filled with new ideas (Leonard-Barton, 1995). In this case, the knowledge management

process would allow companies to create additional value from these ideas and as a result constantly multiply intellectual assets.

## 2.2.2 Technology

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The terms "technology" and "knowledge" are usually considered to be quite similar and their definitions are often overlapping. Nevertheless, it is important to distinguish these terms in order to understand its differences and how these particularities could affect the exploitation and management of both. Most of the authors look at the technology as a sort of explicit knowledge and consider technology, after all, a particular form of knowledge. The general definition of technology could be seen as "sequence of actions, using certain tools, or a rational process, in order to achieve a predefined goal" (Fernandes, 2012). "Technology" could be encapsulated in various technological form, for instance, written on paper, recorded information, a prototype or final object, a piece of software and so on, including any types of tools, machinery or complex systems. These tangible forms of technology are independent of the human mind and represent static forms. In the case technology is represented in a form of any kind of product, it has a well-defined function and forms adequate to these function. As a result, the technology could be seen as a preeminent form of knowledge and is material, objective and identifiable. From the value creation perspective technology is an important part of the intellectual capital of the company, because the process of value creation runs in parallel with the process of knowledge creation.

## 2.2.3 A comparison between Knowledge and Technology

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Previously conducted research showed that human factor is a crucial constraint for innovation and however technology is an important component of any companies intellectual capital, individual knowledge proved to be even more effective for the company's competitive advantage. However, the most important difference between both of them is that: (1) knowledge is more flexible, dynamic, has lots of different forms and exists in people's minds and on the contrary, (2) technology is more a static and tangible form of knowledge that is entrenched in a material base. Knowledge could also be considered as an object if it could be directly observed, stored and as a result successively used again or relocated. Technology could be perceived as a form of knowledge. Activities related to technology creation have a significant difference with knowledge creation: in technology creation, synthesis of knowledge is more important than analysis, whereas producing a new knowledge requires a considerable, structured and grounded analysis.

Following this, a technology-based approach towards knowledge management and exploitation could be used, because it helps to capture knowledge in more tangible form and support its transfer, use, memorization, sharing and re-creation. Whereas the process of exploration could be different, the overall Technology-To-Product-To-Market (TPM) Framework would be explored for Design Thinking knowledge exploitation.

## 2.3 Technology-To-Product-To-Market (TPM) Framework

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The Technology-To-Product-To-Market (TPM) Framework had been developed and well-studied for enterprise purposes that allow companies transform “unique technical capabilities into product features that match enduring customer needs” (Markham and Kingon, 2004). Fliess and Becker highlight that company's ability to produce technological knowledge, then effectively use them for product development and bringing these products to right markets should be the main focus for any organization (Fliess and Becker, 2006). The core process for successful bringing technology to the market is to identify right linkage between the technological capabilities with long-lasting customer needs. This linkage could be set through matching product features with new technology capabilities and further testing them with potential customers.

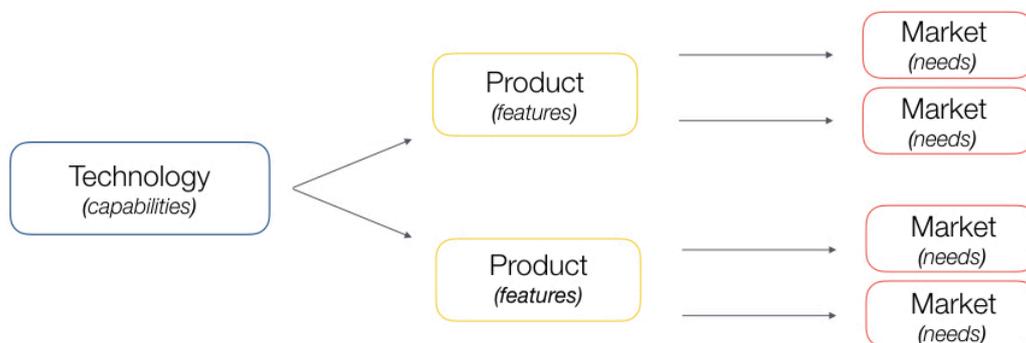


Figure 3: Technology-To-Product-To-Market (TPM) Framework scheme, (Markham and Kingon, 2004).

In order to achieve this goal three steps should be followed: (1) identifying the technical advantage; (2) developing product concepts that use technical capabilities for developing unique product features and then (3) establish the link from product to market. Following this logic, the whole process, starting from finding technologies with unique advantages and along the process elaborate them as product features for further presentation to market seems linear, whereas, in reality, it is more iterative. In this case the term “technology capabilities” means what the technology could do. This identification is also important in order to understand the difference between newly developed technology and already

existing ones: analyze whether two types of technology are fundamentally doing the same thing and in case they are, to identify where the duplication is in technology portfolio and how it could be changed. “Product features” are considered as a set of distinguishing characteristics that will help to boost the product or service to potential buyers. It is usually play an important role in developing the product marketing strategy that eventually highlights this useful and unique features to potentially targeted customers. For effective bringing the product to the market, it is important to understand who are the potential customers and what are their needs. Knowing “customer needs” means knowing what customers want and why — this information could help better understand how to position the product or service on the market to make sure that it will meet the target audience. Knowledge and technology face some different challenges, we conclude that TPM could be used as a methodology for the Evolution 6<sup>2</sup> model exercise.

## 2.4 The Business Model Concept

Business Models became an essential part of any existing or emerging business. It is an effective tool to describe how the company creates, delivers and captures value (Osterwalder & Pigneur, 2010). In other words, it describes how is the company planning to make money. In 1994 Peter Drucker introduced the concept of “business model”, in his article “The Theory of the Business” for Harvard Business Review (1994). Although Peter Drucker did not introduce the term, he was one of the first who rise important questions for business development: who is the customer? What is the customer value? And how company could deliver value to customers at an appropriate cost? (Drucker, 1994) The main goal of a business model is to answer fundamental questions during the process of developing new, or documenting existing businesses, which include value proposition, infrastructure, customers and the financial part. To achieve this goal and make the outcome more tangible, in 2010 Alexander Osterwalder introduced the Business Model Canvas, a management template, that includes nine blocks essential to analyse and structure any kind of business (Osterwalder & Pigneur, 2010). This tool became popular among managers and entrepreneurs faced with a changing business environment and seek new solutions for re-defining strategies (see Appendix B).

*Table 1: 9 blocks of Business Model Canvas proposed by Alexander Osterwalder in 2010*

<b>Infrastructure</b>	<b>Offer</b>	<b>Customer</b>	<b>Finance</b>
<ul style="list-style-type: none"> <li>• partner network;</li> <li>• key activities;</li> <li>• key resources;</li> </ul>	<ul style="list-style-type: none"> <li>• value proposition</li> </ul>	<ul style="list-style-type: none"> <li>• customer relationships;</li> <li>• distribution channel;</li> <li>• customer segment;</li> </ul>	<ul style="list-style-type: none"> <li>• cost structure;</li> <li>• revenue streams;</li> </ul>

Although some authors consider that personal computer changed the nature of business development and planning, business modelling changes the whole approach towards business management. It allows managers to create hypothesis and then test them with different parameters to find the best possible solution, depending on goals that companies set. Moreover it is important to distinguish between business model and business strategy, which are sometimes used as interchangeable terms. In reality, a strategy describes how and what you are going to do better by being different from your competitors. In other words it is more related to firm's differentiation and positioning. Whereas, a business model represent a system that shows how the different pieces of a business fit together: thought-out business models help to establish communication between different parts and, as a result, it helps to broadcast which kind of value the company wants to create not only for their clients, but also for employees. Both, strategy and business models, allow companies to create boundaries around abstract terms and have an enormous practical value. This concepts considered to be fundamental for company performance and align all activities towards the main goals and objectives.

## 2.5 Types of Innovation

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It's been a while since organisations realise that innovation is crucial for successful business development and evolvment. Primarily it is needed as a response to a constantly changing environment and appeared new opportunities offered by emerging technologies, expanded marketplaces and emergent dynamics in different industries.

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*An innovation is a feasible relevant offering such as a product, service, process or experience with a viable business model that is perceived as new and is adopted by customers.*

— Gijs van Wulfen, (2016)

Innovation could be defined as “the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace” (Baregheh & Sambrook, 2009). Baulmol describe innovation as “the recognition of opportunities for profitable change and the persuit of those opportunities all the way through their adoption in practice”. From the other definition made by Boer and During (2001) innovation could be seen as a “creation of a new product-market-technology-organization combination”. All of these definitions highlight the importance for companies being innovative for companies in order to stand out and gave understanding that innovation process could

and should be managed. Companies seeking for innovation facing with different challenges and to overcome them and make the whole process more structured several models related to innovation had been developed.



*The most innovative organizations rely on systems of individuals and teams working across functions in their organizations. Innovation isn't the work of only scientists, engineers, or marketers; it's the work of an entire business and its leadership.*

— Larry Keeley, (2013)

For each company it is important to understand and differentiate in which direction it is better to move according to firm's business and strategic objectives. In order to make the understanding of innovation for companies more applied for the purpose of this research it was decided to look closer at several models of innovation typologies proposed by different authors, compare them and understand which provides the most suitable approach towards changing innovative environment. Distinguishing patterns in managing approach towards innovation and problem-solving could help faster and easier to understand companies which direction could be chosen for further development and which techniques might be useful for implementation.

## 2.5.1 Ten types of innovation by Larry Keeley (Keeley et al., 2013)

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Ten types of innovation is an innovation framework that codifies and structures three decades of work from the consulting firm Doblin in Chicago, currently the innovation practice of Deloitte Consulting LLP, which had been co-founded by Larry Keeley in 1980. Along the company work and research one main question had been arisen: "How to help innovation to succeed instead of fail". The origins of the model combine both business experience and academical approach, as soon as most of the team members are adjust professors in Chicago's Institute of Design. As a result a detailed model for 10 types of innovation had been developed. Looking at innovation as "the creation of a viable new offering" allow Larry Keeley to develop a systematic analysis that allow companies to innovate more effectively. The model organise the different types of innovation in three main dimensions: configuration, offering and experience (Keeley et al., 2013).



Figure 4: Ten types of innovation by Larry Keeley et al. (2013)

### Configuration:

- **profit model** (how you make money: often challenge an industry's tired old assumptions about what to offer, what to charge, or how to collect revenues);
- **network** (how you connect with others to create value: provide a way for firms to take advantage of other companies' processes, technologies, offerings, channels, and brands);
- **structure** (how you organise and align your talent and assets: focused on organising company assets— hard, human, or intangible, in unique ways that create value);
- **process** (how you use signature or superior methods to do your work: involve the activities and operations that produce an enterprise's primary offerings; requires a dramatic change and enables the company to use unique capabilities, function efficiently, adapt quickly, and build market-leading margins).

### Offering:

- **product performance** (how you develop distinguishing features and functionality: address the value, features, and quality of a company's offering; involves both entirely new products as well as updates and line extensions that add substantial value);
- **product system** (how you create complementary products and services: how individual products and services connect or bundle together to create a robust and scalable system).

### Experience:

- **service** (how you support and amplify the value of your offerings: ensure and enhance the utility, performance, and apparent value of an offering);
- **channel** (how you deliver your offerings to customers and users: all the ways that you connect your company's offerings with your customers and users);
- **brand** (how you represent your offerings and business: help to ensure that customers and users recognize, remember, and prefer your offerings to those of competitors or substitutes);
- **customer engagement** (how you foster compelling interactions: all about understanding the deep-seated aspirations of customers and users, and using those insights to develop meaningful connections between them and your company).

The figure below represents the changes in innovation landscape during a ten year period: from 1994 till 2004. Peaks represents spaces where innovators are crowding and valleys signals spaces with minimal investment. It is visible that towards 2004 happens the shift towards innovation in network, structure, process and service, whereas innovation in product performance and product systems shows the minimal investments. This tendency is further could be used as a proof for importance of

innovation in network, structure, process and service and all of these processes could be boosted with the help of Evolution 6<sup>2</sup> model.

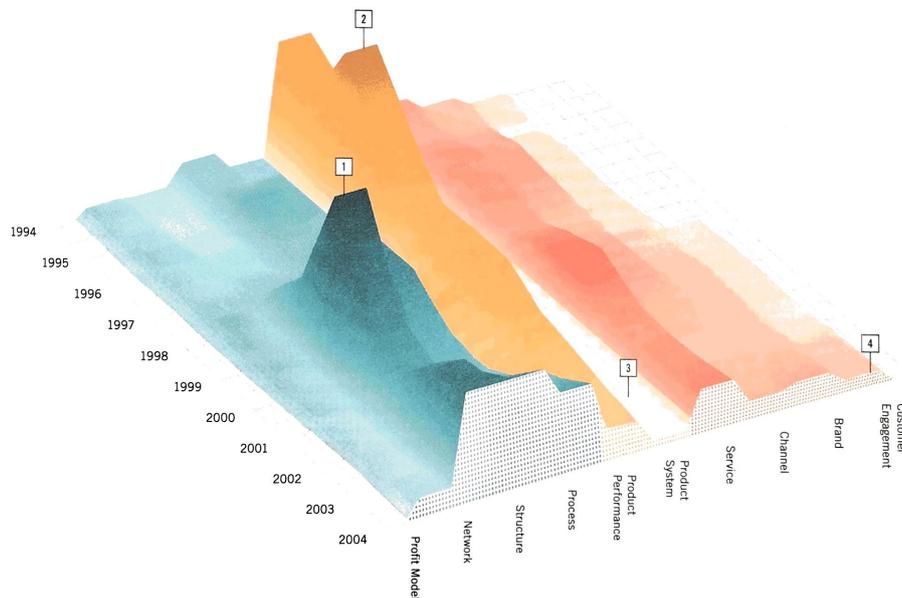


Figure 5: Innovation Landscape: personal communication and media devices (1994-2004)

Using this typology effectively could help companies to successfully innovate in different stages and areas of business development. Author also highlight the importance of understanding the industry where companies are working, recognising the patterns and the ability to shift company's focus while it needed. Understanding customers, products, industry trends and other important factors could significantly boost the innovation process inside any organisation.

## 2.5.2 Oslo Manual Typology: 4 types of innovation developed by Organisation for Economic Co-Operation and Development (OECD) (Organisation for Economic Co-operation and Development, 2005).

The Oslo Manual was prepared by OECD Committee in order to structure data related towards innovation (OECD, 2005). The basis of research was based on data that had been collected during the 1980s and 1990s to develop models and analytical frameworks for the study of innovation. As a result, in 1992 were prepared the manual focused on technological product and process (TPP) innovation in manufacturing. During the next decade, the innovation in different areas significantly evolved and in a 2005 new version of Manual had been produced with additional information including two additional types of innovation: marketing and organisational innovation (OECD, 2005).

- **“Product innovation** — relates the introduction of new or significantly improved service or product considering its original characteristics or presumptive use” (OECD, 2005, p. 48). The

improvements might include new technical specifications, components and materials, software and other functional characteristics (Mortensen & Bloch,2005).

- **“Process innovation** — implies to implementation of a new or significantly improved ways of product or service production or its delivery to the customers. The innovation in process might include changes in techniques of production goods, significantly improved equipment or software” (OECD, 2005, p.49).
- **“Marketing innovation** — include new or improved marketing methods that aims to significantly change the product design, promotion, pricing or product positioning. Innovation in marketing might refer to better understanding customers needs, discovering new markets and re-think the positioning of the company products and/or services in order to increase company’s income” (OECD, 2005, p.49).
- **“Organisational innovation** — relates to application of new organisational techniques and methods inside companys’ business processes, including external and internal relations. This approach can be intended to boost company performance in re-arranging administrative costs, improving labour productivity, structuring and making more accessible the non-tangible assets or decreasing costs of suppliers” (OECD, 2005, p.51).

### 2.5.3 Dave Francis & John Bessant Typology (Francis & Bessant, 2005)

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Dave Francis and John Bessant decided to look at the innovation process from the perspective of capabilities in order to have a more precise targeting for the exploitation of innovation. As a result they created a model which they refer as a 4 ‘P’s of innovation targeting which provides a structured approach for reviewing the opportunity space for innovation. Although this typology was mainly developed in order to structure the ways in which innovation activities are organised and manages, it provides a wide overview of challenges companies might face during the search and implementation or suitable innovation types. According to the authors:

- **“Innovation to introduce or improve products** — include changes in the products or services that company offers. In this case product or service are investigated as an “envelope of possibilities” and innovation related to this area allow companies to find a way of getting competitive advantage in functionality and/or price and let the potential customers know about it” (Francis & Bessant, 2005, p. 172).
- **“Innovation to introduce or improve processes** — means changes in the way products or services are created and delivered. This way of innovating target to improve the operation of company’s existing processes and optimising them in order to increase overall company’s

performance. Process innovation can be facilitated in many different ways, for example by system analysis and/or by comparative benchmarking” (Francis & Bessant, 2005, p. 174).

- **“Innovation to define or re-define the positioning of the firm or products** — aims to change the context in which a company operates and introduces products and services to the market. In other words, position innovation answers the question “what the firm would like typical customers from targeted groups to feel and say about their products”. This type of innovation allows to find new meaning for the product or service that company produce or provide in the eyes of potential customers” (Francis & Bessant, 2005, p. 175).
- **“Innovation to define or re-define the dominant paradigm of the firm** — includes changes in the essential models which frame what the organisation does. Authors divide this category in two sub-categories: a) inner-directed paradigm that target organisational values and people management policies; b) outer-directed paradigm which is related to business models in other words the systems of coherent, comprehensive, explicit and/or implicit constructs used by managers to understand their firm and shape its development” (Francis & Bessant, 2005, p. 176).

The typology developed by Dave Francis and John Bessant helps companies to adjust their innovation agenda according to their specific goals and needs. The 4’P’s approach could be useful for strategic development and change the attitude from “do better” to “do different” (Francis & Bessant, 2005).

## 2.5.4 A comparison between different innovation typologies

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During the literature review it was observed that all three typologies have some types of innovation in common. Product and process innovation came primarily from technological areas, whereas others, like marketing or organisation innovation had been highlighted quite recently due to an overall shift in innovation space: companies understood that innovation could come not only from product, service or process, but from the other fields too and nevertheless could be effective for company’s goals.

Any innovative environment requires a quick decision making process and always align with the main goal strategy. Understanding different types of innovation could help enterprises more comfortably operate in a constantly changing context and better coordinate people and further moves.

Distinguishing between different types of innovation will allow, that companies deeper understand the possibilities for innovation and further directions for evolvement. Considering this typologies it is easier to create a sources linkage in a company for any innovative activities in order too boost companies growth and sales. Understanding types of innovation could be important from the strategic perspective in order to understand which steps could be more relative and coherent for the overall business strategy.

Table 2: Benchmarking the models with different types of innovation: Oslo Manual typology (2005), Dave Francis & John Bessant typology (2005) and Ten types of innovation by Larry Keeley (2013); developed by author

Oslo Manual (2005)	Larry Keeley Model	Dave Francis & John Bessant (2005)
Product Innovation	Offering: <ul style="list-style-type: none"> <li>• <i>product performance</i></li> <li>• <i>product system</i></li> </ul>	Product Innovation
Process Innovation	Configuration: <ul style="list-style-type: none"> <li>• <i>profit model</i></li> <li>• <i>network</i></li> <li>• <i>structure</i></li> <li>• <i>process</i></li> </ul>	Process Innovation
Marketing Innovation	Experience: <ul style="list-style-type: none"> <li>• <i>service</i></li> <li>• <i>channel</i></li> <li>• <i>brand</i></li> <li>• <i>customer engagement</i></li> </ul>	Position Innovation
Organisation Innovation		Paradigm Innovation

From the detailed descriptions of the models and table above it was decided to focus primarily on the Oslo Manual typology. For more comprehensive and extensive categorising, we combined the typology with some categories from Larry Keeley's Model in order to make the approach more specific. The typology showed below could give more precise understanding of possible companies goal toward innovation. Also it could be useful for understanding the linkage between different types of innovations.

Table 3: Combined version of innovation typologies; developed by author

## Innovation Types

Product Innovation	<ul style="list-style-type: none"> <li>• <i>product performance</i></li> <li>• <i>product system</i></li> <li>• <i>service</i></li> </ul>
Process Innovation	<ul style="list-style-type: none"> <li>• <i>process</i></li> </ul>
Marketing Innovation	<ul style="list-style-type: none"> <li>• <i>channel</i></li> <li>• <i>brand</i></li> <li>• <i>customer engagement</i></li> </ul>
Organisational Innovation	<ul style="list-style-type: none"> <li>• <i>profit model</i></li> <li>• <i>network</i></li> <li>• <i>structure</i></li> </ul>

The Oslo Manual has been initially developed in a technological environment and later amended with marketing and organisational innovation types. Larry Keeley's model is the result of research in both, academic and business environment, therefore it emphasises the importance of constantly revising the approach towards innovation strategy inside the company. Our combined version considers different types of innovation and emphasises not only product and service innovation, but also marketing and organisational innovation.

## 2.6 Literature Gap and First Conclusions

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The analysis of the literature related to the process models exploitation and adaptation Design Thinking models towards business needs, shows, that this topic hasn't been broadly covered in literature. Most commonly the question has been addressed from the perspective of knowledge exploitation — some authors propose process models as effective tools for companies, to manage available knowledge not as a static pool, but rather as a source, constantly filled with new ideas (Leonard-Barton, 1995) and as a source of innovation respectively.

During the last years, it has been seen that, due to the evolution of different businesses in various industries, arose the need of bringing design approaches to envision new possibilities.. In this context “Design Thinking” could be seen as a way of thinking which leads to transformation, evolution and innovation in various organisational dimensions. It is also could be perceived as a mindset that leads to new ways of managing the business (Tschimmel, 2012). Consequently, it becomes evident that for sustaining future of any organisation creating value for customers through human-centered approach is a necessity (Khalifa, 2008).

In 2007 the British-based Design Council shared an extensive research, where it stated that “design can directly and significantly improve sales, profits, turnover and growth” (Design Council, 2007). Provided data showed the significant linkage between design and better business performance. This proves the actuality of current research, related to the exploitation of the DT Evolution 6<sup>2</sup> model to bring it closer to the business environment.

Whereas the significant research has been made related to the impact that Design Thinking models could bring to companies, there has not been shown how the DT model could be used as a product in order to reach different markets. For this purpose, it was decided to base the exploitation strategy on the technology-to-product-to-market framework and adopt it for Evolution 6<sup>2</sup> model exploitation strategy.

Through the theoretical background review, it was planned to answer following questions: (1) is there a difference between technology and knowledge exploitation, and (2) if it would be possible to use technology-to-product-to-market framework (TPM) for a process model exploitation such as Evolution 6<sup>2</sup> model. Comparing technology and knowledge it has been discovered that technology is

considered as a tangible and static form of knowledge captured in a material form, whereas knowledge is more dynamic and broad term that exists within people's minds. This comparison helped us to answer the next question related to the transformation of technology-to-product-to-market framework into knowledge-to-product-to-market, as soon as Evolution 6<sup>2</sup> model could be seen as a product of Design Thinking knowledge. The mentioned above shift is possible in case the knowledge capabilities, product features and markets needs are identified properly. Also the concept of business model and Business Model Canvas has been introduced for making the outcome of the research more tangible and applicable. This concept would be useful during the case study analysis to answer the key questions for successful product elaboration.

Another objective of this research is to understand how design thinking models such as Evolution 6<sup>2</sup> could be applied towards business needs and be commercialised. Creative models are usually developed as a supportive tool for a main companies activities and created in order to promote Design Thinking approach with different areas and industries. Whereas creative models are usually not perceived as a business tools and consequently haven't been developed further to commercialisation stage. One of the main goals of this research is to develop a framework for implementing the Evolution 6<sup>2</sup> DT model for effective execution of innovation processes inside any organization. Based on this framework the business model with detailed steps for each process would be elaborated.

In order to more clearly understand needs of potential customers of Evolution 6<sup>2</sup> model, or market needs, various typologies of innovation has been covered. Based on analyses of all of them, has been developed a typology more suitable for goals of this research. Thoughtful approach towards distinguishing between different types of innovation will allow the companies better understand the possibilities for innovative activities and further directions for evolvement. Considering this typologies it is easier to create a sources of linkage in a company for creative activities in order to boost companies growth and sales. Also understanding types of innovation could be important from the strategic perspective in order to understand which steps could be more relative and coherent for the overall business strategy.

Upper mentioned theoretical background has been made in order to prepare a foundation for a case study research. Applied case study approach allow to combine all collected theory and put it in more practical context. The case study method has been defined by Robert K. Yin as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used" (Yin, 1984, p. 23). The applied context has been chosen in order to: (1) investigate a particular context the company MINDSHAKE and achieve a specific task (develop a complementary business model); (2) work towards generating a certain, pre-defined outcome and possibly implement it later.

## III. Design Thinking Models

Across various industries, Design Thinking proved to be an effective strategy for innovation. In order to translate the DT mindset to the wider audience, several new models of processes and toolkits emerged. The main goal is to improve, accelerate and visualize creative processes, which expanded beyond design-related professions and include also multidisciplinary teams in any kind of organization. The origins of DT emerged from the research of design cognition, which explained and expresses the ways experienced designers usually approach design problems.

Originally all of the Design Thinking models considered to be process models — a sequence of processes of the same nature that gathered into a model, which could be seen as the approximate assumption of what the overall process will look like. Models emerged from Design Methodologies and intention to transform how people work in a traditional way and lead the whole process to a better innovation. Practicing DT in various industries brings responsibility to all members involved in a process and makes innovation and creativity as a part of the organisational culture. The incorporation of the Design Thinking approach could be done through practice, and DT models are a great way to bring this methodology directly to the customers.

### 1. Discovery

Choose an affirmative, strategic topic.  
Gather data. Understand & empathize with unmet needs

### 2. (Re)Frame opportunity

Look for patterns & insights.  
Question assumptions.  
Frame your POV. Define your scope.

### 3. Incubate

Switch gears. Feed your brain with diverse stimuli.  
Meditate. Sleep on it.

### 4. Ideate / Illuminate

Experiment. Explore possibilities. Envision a desired future. Co-create in diverse teams. Make your ideas visible.

### 8. Iterate & Scale

Evaluate. Learn. Create, Innovate.

### 7. Deliver

Final testing, approval and launch

### 6. Rapid Prototype / Test

Think big, act small fail fast; learn from end-users and refine

### 5. Evaluate / Refine Ideas

What is desirable, feasible, viable about your ideas? What are the constraints

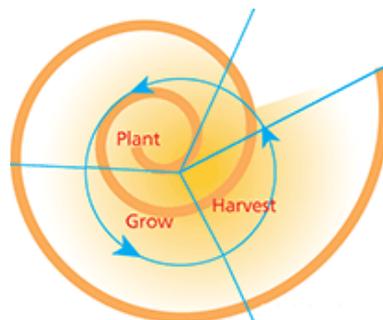


Figure 6: A Framework for Design Thinking Process

Source: Linda Naiman for Creativity At Work (2016)

In general, for a successful execution of DT for innovation, the whole process might be represented as the described below sequence of steps. All models somehow follow this sequence, whereas providing different tools and techniques for DT exploitation.

The visual perception plays an important role in DT process so most of the models and toolkits emphasize the importance of graphical representation of the process. Visualizing thoughts about different aspects of the project helps to expand the space around the problem and, as a result, create additional space for new discoveries and possible solutions. The tools allow managers and other DT users to improve their practice in a tangible way - and help to translate the way of thinking into the way of being.

A conceptual model of Design Thinking represents how the incorporation of DT methods and models plays an important role in this process: they “try to replicate the non – linear and iterative character of the process, and the alternation between divergence and convergence moments, inherent in design problem solving” (Clemente, Vieira & Tschimmel, 2016). The figure above illustrates the overall iterative DT process and its interactive nature, which highlights the complexity of the process.

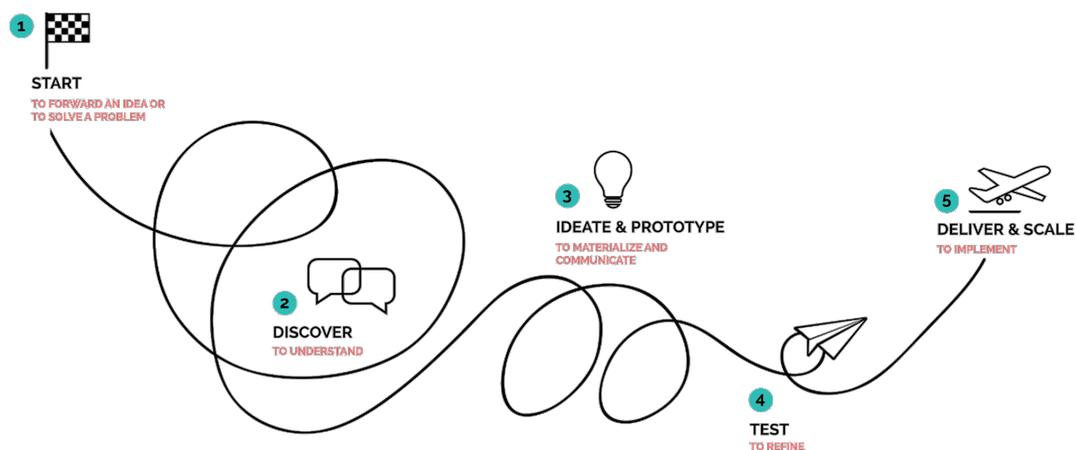


Figure 7: Design Thinking Process, Source: FutureFlex.co (2017)<sup>1</sup>

For this research it was decided to study 5 different DT models: The Double Diamond model proposed by Design Council, IDEO Human-Centered Design of 3 I's, the 5 Step Design Thinking Model developed by Stanford d. School, FORTH Innovation Methodology by Gijs van Wulfen, and the Evolution 6<sup>2</sup> Model had been developed by Katja Tschimmel. These models were picked by their prevalence, origins and fields of implementation. The detailed analysis and further comparison of the models are proposed in order to better understand how and where these models are implemented. This information will be used for analysis of model's exploitation strategies.

<sup>1</sup>FutureFlex.co. 2017. [ONLINE] Available at: <https://futureflex.co> [Accessed 9 July 2017]

### 3.1 Evolution 6<sup>2</sup> Design Thinking Model

The Design Thinking Evolution 6<sup>2</sup> Model has been developed by Katja Tschimmel between 2012 and 2015. The Evolution 6<sup>2</sup> model separates the creative process into six stages: Emergence, Empathy, Experimentation, Elaboration, Exposition and Extension; each of the stages consist from 2 sub-stages that are corresponding to moments of divergence and convergence thinking. Beside this the model provides 36 techniques that could be applied to each of the stages. The Evolution 6<sup>2</sup> is a Design Thinking model created for any types of businesses and organizations in order to boost transformation and innovation processes. It is an effective framework that is flexible and adaptable towards the company's goals and objectives.

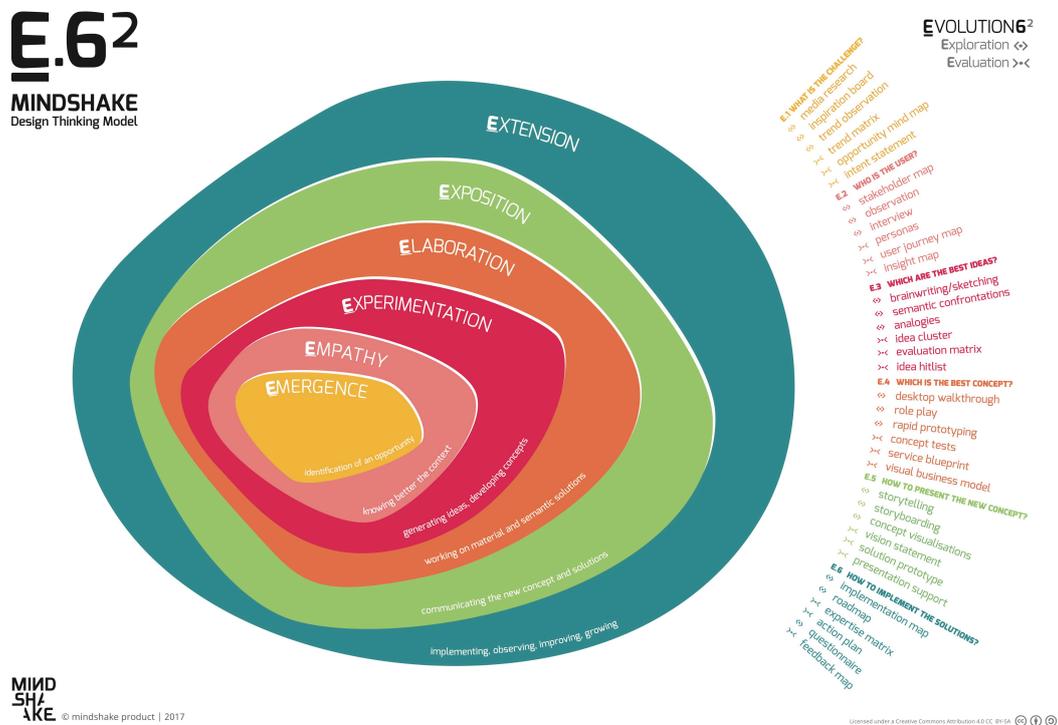


Figure 8: Design Thinking Model Evolution 6<sup>2</sup> by Katja Tschimmel<sup>2</sup>

The title “Evolution 6<sup>2</sup>” was chosen for following reasons:

- Evolution, because the creative process is an evolutionary process, iterative and interactive (people and situations). The graphic design shows that each E-phase of the model is related to the others in iterative cycles.
- E6, because the model E6 is divided into 6 phases all of which begin with E: Emergence, Empathy, Experimentation, Elaboration, Exposition and Extension.

<sup>2</sup> <http://mindshake.pt>. 2017. *mindshake.pt*. [ONLINE] Available at: <http://mindshake.pt>. [Accessed 15 July 2017].

- E6<sup>2</sup> because in each phase of the process, moments of divergence (Exploration) and convergence (Evaluation) occur, making it “six squared”.

At the beginning, it was developed as a creative process model and along the research process has been transformed into a Design Thinking model. Creative thinking directly related to cognitive processes that include “flexibility, originality, and fluency” (Drucker, 1984). So following this characteristics, creative thinking could be trained in order to boost the efficacy of the cognitive system. Design Thinking also has been described as a cognitive activity that using design techniques and approach helps correspond people’s needs with technological feasibilities and business strategies. The main difference between terms “creative thinking” and “design thinkign” is that creative thinking is a more broad concept that aims to achieve “newness”, whereas Design Thinking is more practical and applied term, that could help convert user’s needs into opportunities. Creative thinking could be perceived as a starting point for an innovation process, and Design Thinking could be considered as a more applied approach.

The origin of the Evolution 6<sup>2</sup> Model came from the approach described by Tim Brown. He considered that design thinking is an approach towards innovation and it becomes successful at the intersection of what is desirable for users, what is feasible from a technological point of view and what could be economically viable.

Following this description, the Evolution 6<sup>2</sup> model has been designed keeping these principles in mind but added more grounded research towards the innovation process itself. Therefore it has a background based on (1) creativity research; (2) design methodology; (3) business viability; (4) people’s desirability and (5) technology feasibility. As a result, this approach makes the model more flexible towards different areas of implementation. Knowledge that has been gathered from mentioned above disciplines, resulted the development of Design Thinking model and make the knowledge more explicit. Whereas the model itself could help the companies to explore, effectively use and manage both tacit and explicit knowledge while also define a wide strategic opportunities for a companies. Practicing Design Thinking inside companies processes could be seen as a dynamic social affair that relies on a collaborative network of individuals all pulling together towards a common goal. The model is used in the development of products and services, in

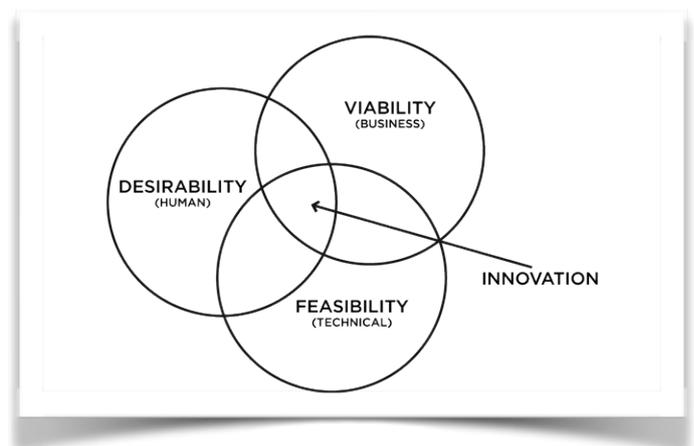


Figure 9: Definition of successful innovation by Tim Brown (2017): intersection of three forces: desirability, feasibility and viability

workshops and coaching sessions, in research projects, and int methodology lessons, among others. As a process model, Evolution 6<sup>2</sup> includes a sequence of 6 stages with propose tools for each stage.

The first stage is **Emergence** which represents the identification of an project opportunity and helps to understand what is the challenge. The proposed tools at this stage include the Inspiration Board, Intent Statement, and Opportunity Mindmap. Then follows the **Empathy** phase that allows understanding who is the user. This stage includes tools as Interview, Persona Map or User Journey Map. Next is **Experimentation** phase that helps to generate ideas, separate the best ones and develop concepts. The key activities at this stage could be Brainwriting or Sketching, Semantic Confrontations or Evaluation Matrix. After this, it's time for the **Elaboration** stage that proposes to work on material and semantic solutions for the selected concepts, developed on a previous stage. Tools that help to elaborate this process include Rapid Prototyping, Service Blueprint or Concept Testing. Following this stage, goes the **Exposition** stage that highlights the importance of proper communication of the new concepts and solutions. Here could be used a Solution Prototypes, Vision Statement or Storytelling Technique. And the **Extension** stage that helps to implement, observing, improving and further developing the selected on previous stages solutions. Here could be used Implementation Map, Action Plan or Roadmap.

Also, working with model, could be done with a supporting tools, like Mindshake Design Thinking Cards or printable templates. The Mindshake Design Thinking Cards, which look similar to playing cards, consist of 78 cards which form a toolkit and which direct a creative process based on the Evolution 6<sup>2</sup> model. 36 cards represent the 36 techniques which make up the Evolution 6<sup>2</sup> model, 36 are photos which are examples of each of the techniques, and the rest explain the use of the card set.

Figure 10: The  
Mindshake  
Design Thinking Cards  
(Source: [mindshake.pt](http://mindshake.pt))



The cards can be used in various ways: (1) carefully arranged, or randomly shuffled, as a source of information, and learning technique of Design Thinking methods; (2) scattered about, and used to inspire the team to devise their own creative process; (3) fixed to the wall to help the creative process and the execution of innovation tasks, indicated by the Evolution 6<sup>2</sup> phases; (4) could be used for search for pairs, composed by one technique and one photograph which represent the technique in action; (5) in teams looking for pairs suitable for each phase of the model (Source: [mindshake.pt](http://mindshake.pt))

### 3.2 Design Council: The Double Diamond Model

The Double Diamond model has been developed by the charity organization Design Council that focus mostly on using design as a strategic tool to deal with major social challenges. The Double Diamond represents a visual map, which is helping to follow the design process and is divided into four phases: Discover, Define, Develop and Deliver. The model emphasize the combination of divergent and convergent thinking for different stages of the creative process. The graphical representation of this two processes shaped a diamond where the name of the model came from. The Double Diamond model shows that during the creative process convergent thinking is necessary for two purposes: first, to confirm the problem definition and secondly to define the solution. Also, as any creative process, is iterative the proposed model allow to develop, test and refine the ideas a number of times and during this process, the weak ideas are just propped.

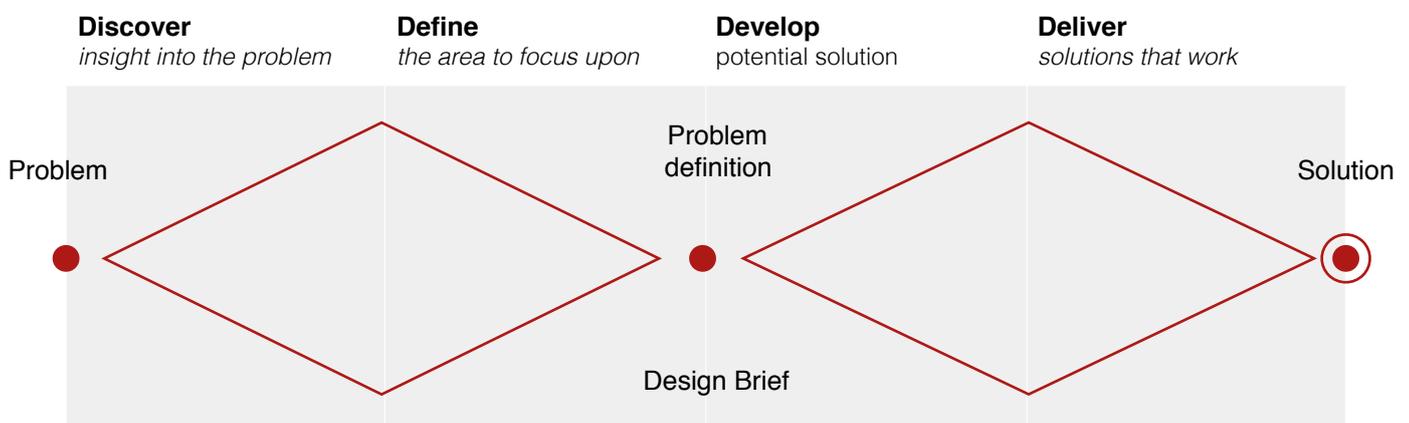


Figure 11: The Double Diamond Design Thinking framework, Source: [www.designcouncil.org.uk](http://www.designcouncil.org.uk)

The Double Diamond model propose 4 phases that help to manage and stimulate the creative process in order to come up with innovative solutions. The first phase of the model is **Discover** and it covers the start of the project. Users are proposed to try to look at the world in a new way, pay more attention to new things and collect insights. In the **Define** stage, users are proposed to look more critically on all the possibilities and insights that were gathered in the “Discover” stage. At this phase is important to analyze the collected information and understand which matters most, what is more, feasible and prioritize the ideas. The goal here is to develop a clear creative brief that frames the fundamental design challenge. The **Develop** stage covers the period of further elaboration of the selected ideas: concepts are created, prototyped, tested and iterated. At this stage users facing with errors and experiment with implementation of the concepts in order to improve and clarify their ideas. The final stage **Delivery** summing up the whole process before and users supposed to come up with a resulting project. This stage presumes that the final concept (service or product, for example) would be finalized, produced and launched.

### 3.3 IDEO Human-Centered Design of 3 I's (*Inspiration, Ideation, Implementation*)

IDEO is an international design and consulting firm founded in Palo Alto, California, in 1991. IDEO was one of the first design companies that started to use the Design Thinking methodology towards the design process of new products, services, and even environments and digital experience. The company has been using human-centered design as a creative approach to problem-solving. According to IDEO “the process is designed to get you to learn directly from people, open yourself up to a breadth of creative possibilities, and then zero in on what’s most desirable, feasible, and viable for the people you’re designing for”.

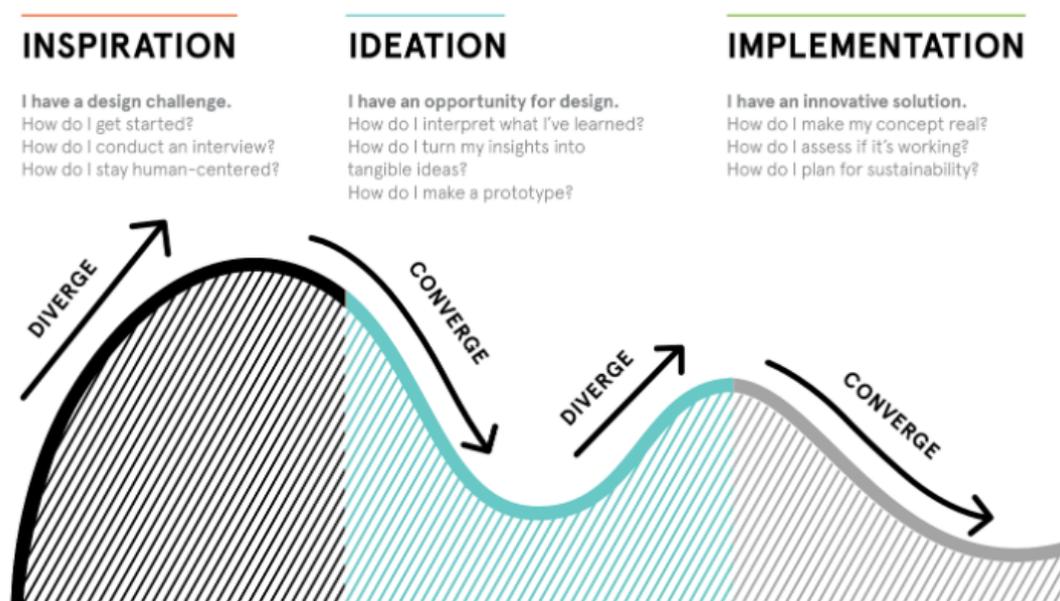


Figure 12: Systematic Innovation through IDEO's 3I Model: Inspiration, Ideation and Implementation<sup>3</sup>

In 2001 IDEO came up with a Design Thinking model that allows to shape the creative process in 3 phases: Inspiration, Ideation and Implementation.

The **Inspiration phase** dedicated to framing the design challenge itself, creating a project plan, building a team, recruiting necessary for project implementation tools and collecting the data through different techniques. The techniques might vary depending on the objectives of the project: interviews, immersion, observation and others.

The **Ideation phase** started after Inspiration one and dedicated to analyzing collected data, identify opportunities for possible solutions and building rough prototypes for selected ideas. This phase requires more narrow down approach towards the all information that been collected and the loop of

<sup>3</sup> <https://www.ideo.com/>. 2017. IDEO. [ONLINE] Available at: <https://www.ideo.com/>. [Accessed 15 July 2017].

iteration, refining and building supposed to be repeated until the final solution will be ready to be delivered to market. There are lots of different tools that might be useful at this stage: brainstorming and filling the insight statements, creating frameworks for strategy development, selecting most promising ideas, rapid prototyping, business model canvas, collecting feedback and iteration according to it.

After all of these preparation follows the **Implementation phase** that allows teams to bring their solutions to the market. This phase dedicated to all types of practical testing and implementation of final idea: live prototyping which is running final solution for a couple of weeks out in the real world, road mapping the business strategy what my help to keep up with timing, build partnerships, pitching the idea to possible investors or customers and finally monitoring and evaluating the feedback.

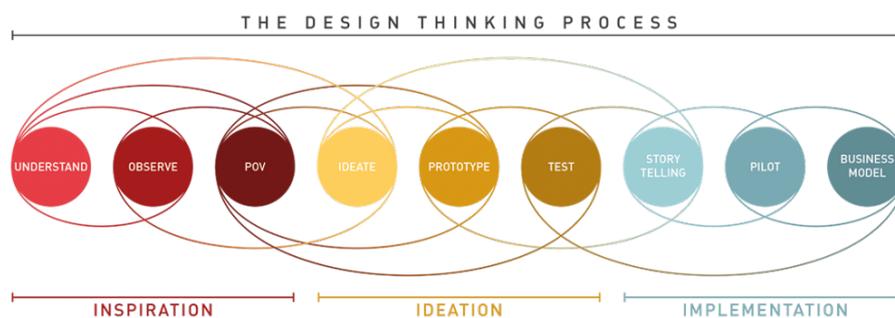


Figure 13: Example of implementation the lean startup methodology with IDEO 3 I's Model  
Source: ReadyTalk (2016)<sup>4</sup>

### 3.4 Stanford d. School 5 Steps Design Thinking Model

Stanford University Design Department developed a five-step Design Thinking model that allow applying design-related methodologies towards any problem in any field.

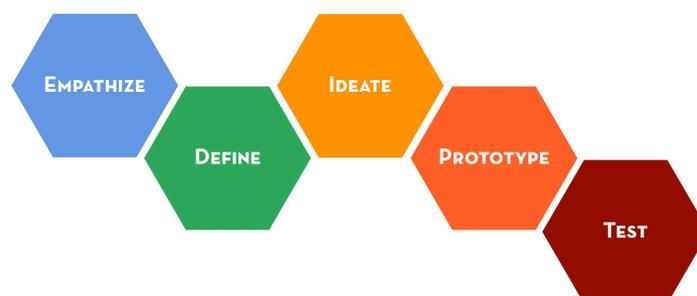


Figure 14: Stanford d. School 5 Steps Design Thinking Model; Source: Stanford d.School (2017)

They also developed a set of tools that are helping to deconstruct any problem and helps to come up with a creative, innovative solution.

<sup>4</sup> ReadyTalk. 2016. [ONLINE] Available at: <http://readytalk.com/>. [Accessed 20 June 2017]

**Empathize Mode:** empathy is a key quality in a human-centered design approach. It is important to empathize towards people's needs and problems in order to come up with the best possible solution. By observing what people do and why their physical and emotional needs and what is meaningful to them it is a great way to identify the problem correctly and therefore solve it.

**Define mode:** after gathering all the information by observing and listening to the users the next step is to define the challenge or problem that needed to be solved. The main goal of the define mode is to craft a meaningful and actionable problem statement. The core of good problem statement could be defined as understanding who are the users, what specific needs they might have and which insight had been gathered on a previous stage.

**Ideate Mode:** after defining a clear problem statement next step is an ideation process. The objective of this mode is to make a shift from identifying problems to creating solutions for your users. Also it is important to come up with a wide range of ideas: from the most obvious one to the wildest one. Generating lots of ideas allows to select only few good, but find the best available solution available.

**Prototype Mode:** the ideation process could be very massive and it is important to select several best ideas to move them to the further mode - prototype mode. Prototyping the possible ideas could be extremely useful: building them could also bring lots of insights and testing them help to learn more about their implementation. Stanford d.School highlighted that prototype can be anything that a user can interact with and ideally that should be something a user can experience. Also, it is important to identify what had been tested with each prototype because it should answer a particular question.

**Test mode:** test mode requires putting the prepared on a previous stage prototypes into user's hands. Ideally, it could be tested within a real context of the user's life. It is also recommended to "prototype as if you know you're right, but test as if you know you're wrong" because testing is initially a great chance to refine defined solutions and make them better.

### 3.5 FORTH Innovation Methodology by Gijs van Wulfen

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FORTH Innovation Methodology had been developed by Gijs van Wulfen in order to improve and structure the innovation process in organizations. Although it is not formerly considered a DT model, it is using Design Thinking tools for the innovation process. FORTH is a five steps method that covers five different stages of the innovation development: Full Steam Ahead, Observe & Learn, Raise Ideas, Test Ideas and Homecoming.

The author compares the process of innovation with a 20 weeks expeditions and believe that with a proper facilitation the outcome would be 3-5 mini new business cases.



Figure 15: FORTH Innovation Methodology by Gijs van Wulfen (Van Wulfen, G., 2012)

**Full Steam Ahead:** the first step towards creating new concepts is good preparation. In order to clearly understand the final goal, it is crucial to formulate an innovation assignment, that will allow to formulate appropriate team and pick the right tools to achieve the final goal. This process took about five weeks.

**Observe & Learn:** for this stage author highlights the importance of “starting viewing things differently and detach yourself from your own existing thought patterns and habits”. The main goal of this stage is to collect new insights and discover new innovation opportunities. This stage requires about six weeks.

**Raise Ideas:** next stage consists from a two-day new product brainstorming session and a concept improvement workshop. All the information gathered on previous stages are shaped into concepts during the two-day new product brainstorming session. After that, during concept development workshop all new products, services or business models concepts are moving further in development. This stage took around 2 weeks and considered to be a creative peak of the expedition.

**Test Ideas:** testing ideas allow segmenting all pool of new concepts in order to select the most promising and suitable ones. This is where important to communicate with customers and collect the feedback and at the end of this phase 3-5 new concepts would be selected by innovative team and developed as mini new business. This stage took around 3 weeks.

**Homecoming:** The final stage of the FORTH methodology is presenting three to five attractive new product or service concepts to top management. All business cases supported with a rough business plan and enough support to fill the innovation pipeline.

### 3.6 Design Thinking models benchmarking

The Double Diamond Model and Stanford d. School 5 Steps Creative Thinking Model had been developed based on academical research. The Double Diamond Model is used by non-profit organization Design Council and Stanford d. School Model had been developed as a supportive tool for Stanford University's staff and students in their academic activities. IDEO has been one of the first product design company that introduced the human-centered design approach. Their 3 I's model that include inspiration, ideation and implementation had been initially developed in order to support the company's main activities: designing products and services. Later they develop it into a thought-out model that might be used in different areas and industries. The FORTH Innovation Methodology had been developed by Gijs van Wulfen as a tool to support his coaching and training work. Currently it is used by FORTH facilitators in order to promote the model in their organization or as a consultant for their clients and requires certification. The Design Thinking Model Evolution 6<sup>2</sup> has been developed based on solid academic research and could be implemented in all types of business and organisations. It is effortless in visual perception and as soon as it has been licensed since 2015 under Creative Commons Attribution 4.0 International License in the version 'by-sa' it could be used freely by everyone.

*Table 4: Benchmarking of origins of different Design Thinking models; developed by author*

<b>Model</b>	<b>Academic Origin</b>	<b>Business Origins</b>
Design Council: The Double Diamond Model	X	
IDEO Human-Centered Design of 3 I's		X
Stanford d. School 5 Steps Design Thinking Model	X	
FORTH Innovation Methodology by Gijs van Wulfen		X
Design Thinking Model Evolution 6 <sup>2</sup>	X	

The Double Diamond model as a part of non-government organisation program has a broad application in different areas from public sector to tech start-ups. The IDEO model at the beginning had been widely applied mostly for product and service development and later grow bigger for other areas of appliance. d. School came from academic environment and therefore propose lots of tools for educators and researches; nevertheless it also promote Design Thinking education through their online platform. On the other hand, the FORTH model came from business so it proved itself for

different industries. Whereas Evolution 6<sup>2</sup> combine the academic and business spheres of application: it had been successfully used for academics for effective research execution and had been used for different businesses and industries. The table also shows that adapted insights and methodologies from Design Thinking could be applied in any areas and could contribute to different types of projects. During the last decade design techniques had entered management practice as a strategic and effective tool for developing successful future businesses. This broad use of process models illustrate that design become an integral part of organisations and bring the value both to the customers and sequently contribute the company, combining the knowledge base with cross-functional team-work. This approach eventually fundamentally changes existing business practices.

Table 5: Benchmarking of different services and channels of application for different DT models;  
developed by author

<b>The Double Diamond Model</b>	<b>IDEO HCD Model</b>	<b>d. School 5 Steps Model</b>	<b>FORTH Innovation Model</b>	<b>Evolution 6<sup>2</sup> Model</b>
<i>Organisational Context</i>				
<ul style="list-style-type: none"> <li>• Business Growth;</li> <li>• Service Transformation Independent and Expert Design consultation;</li> <li>• Design review and training;</li> <li>• Team work with cross-sector network;</li> </ul>	<ul style="list-style-type: none"> <li>• Design of products, services, environments, digital experiences;</li> <li>• Management consulting;</li> <li>• Organizational design;</li> </ul>	<ul style="list-style-type: none"> <li>• Practicing Designers and Career Professionals;</li> </ul>	<ul style="list-style-type: none"> <li>• Training for Facilitators (+ certification);</li> <li>• Coaching;</li> </ul>	<ul style="list-style-type: none"> <li>• Coaching of project development;</li> <li>• Training for creative thinking;</li> <li>• Courses for Facilitators;</li> <li>• Ideation sessions;</li> </ul>
<i>Public Context</i>				
<ul style="list-style-type: none"> <li>• Public sector training &amp; coaching for community groups, charities and funders;</li> <li>• Pre-revenue ventures;</li> </ul>	<ul style="list-style-type: none"> <li>• IDEO Future;</li> <li>• OI Engine;</li> <li>• IDEO Collab;</li> </ul>	<ul style="list-style-type: none"> <li>• Executive and Business Leaders Collaboration;</li> </ul>	<ul style="list-style-type: none"> <li>• Speeches;</li> <li>• NGO Workshops;</li> </ul>	<ul style="list-style-type: none"> <li>• Workshops;</li> <li>• Speeches;</li> <li>• Social Innovation;</li> </ul>
<i>Academic Context</i>				
<ul style="list-style-type: none"> <li>• Universities, particularly science and technology;</li> <li>• Commercialising research;</li> </ul>	<ul style="list-style-type: none"> <li>• Design Thinking for Educators;</li> <li>• IDEO U: A School for Unlocking Creative Potential;</li> </ul>	<ul style="list-style-type: none"> <li>• Faculty Workshop;</li> <li>• Teaching Fellowship;</li> <li>• Project Fellowship;</li> <li>• d.School Program</li> <li>• K12 Program (for educators)</li> <li>• Academics at Stanford</li> </ul>	<ul style="list-style-type: none"> <li>• Lecturers;</li> <li>• Master Classes;</li> </ul>	<ul style="list-style-type: none"> <li>• Research Projects with European Universities;</li> <li>• Master Classes;</li> <li>• Guest Lectures;</li> </ul>

The table below describe various industries of application for Design Thinking models. The broad variety of models implementation proves that the areas if implementation DT methodologies is wide and could be used for any types of business.

Table 6: Benchmarking of different fields of implementing DT models; developed by author

<b>The Double Diamond Model</b>	<b>IDEO HCD Model</b>	<b>d. School 5 Steps Model</b>	<b>FORTH Innovation Model</b>	<b>Evolution 6<sup>2</sup> Model</b>
<i>Organisational Context</i>				
<ul style="list-style-type: none"> <li>• Small and Medium-Sized Businesses;</li> <li>• Planners, Developers, Architects;</li> <li>• Designers and Creative Industry Bodies;</li> </ul>	<ul style="list-style-type: none"> <li>• Financial Services;</li> <li>• Food &amp; Beverage;</li> <li>• Media;</li> <li>• Medical Products &amp; Services;</li> <li>• Organisation Design;</li> <li>• Retail and Hospitality;</li> <li>• Toys &amp; Games;</li> <li>• Technology;</li> <li>• Service Design;</li> <li>• Venturing;</li> <li>• Brand;</li> <li>• B2B;</li> <li>• Consumer Goods &amp; Services;</li> <li>• Energy;</li> <li>• Environment;</li> <li>• Experience Design;</li> </ul>	<ul style="list-style-type: none"> <li>• Executive and Business Leaders;</li> <li>• Practicing Designers and Career Professionals;</li> </ul>	<ul style="list-style-type: none"> <li>• Service Companies;</li> <li>• Industrial Organisation;</li> </ul> <p><b>Facilitators from sectors:</b></p> <ul style="list-style-type: none"> <li>• Financial;</li> <li>• Building;</li> <li>• Paper;</li> <li>• Logistic;</li> <li>• Pharmacy;</li> <li>• Social;</li> </ul>	<ul style="list-style-type: none"> <li>• Pharmacy Industry;</li> <li>• Banks &amp; Insurance;</li> <li>• Supermarkets;</li> <li>• Telecommunication;</li> <li>• Textile Industry;</li> <li>• Advocate;</li> <li>• Real Estate Sector;</li> <li>• Glass and Packaging Industries;</li> <li>• Cork Industry;</li> <li>• Alimentation Industry;</li> <li>• Consultancies;</li> <li>• Webdesign;</li> </ul>
<i>Public Context</i>				
<ul style="list-style-type: none"> <li>• Government Departments and Public sector Organizations;</li> <li>• Community Groups;</li> </ul>	<ul style="list-style-type: none"> <li>• Government;</li> <li>• Non-Profit;</li> </ul>	<ul style="list-style-type: none"> <li>• Career Professionals from public services;</li> </ul>	<ul style="list-style-type: none"> <li>• Government institutions and NGO;</li> </ul>	<ul style="list-style-type: none"> <li>• Incubation Centres;</li> <li>• Museums;</li> </ul>
<i>Academic Context</i>				
<ul style="list-style-type: none"> <li>• Universities, Research Organizations and Tech Start-ups;</li> </ul>	<ul style="list-style-type: none"> <li>• Education;</li> </ul>	<ul style="list-style-type: none"> <li>• Academics at Stanford;</li> </ul>	<ul style="list-style-type: none"> <li>• Universities;</li> </ul>	<ul style="list-style-type: none"> <li>• Universities, Research Organizations and Tech Start-ups;</li> </ul>

The table below describe tools that support different Design Thinking models. The most developed tool-set proposed by IDEO and Stanford d. school that suggest a range of techniques depending from the client type and objectives. The Double Diamond model was proposed by Design Consul as a supportive tool for their main non-government organisation activities. FORTH innovation model introduced an Innovation Expedition map that were developed in order to assist facilitator during the Design Thinking workshops. Evolution 6<sup>2</sup> represent a visual model whereas it could be used with Mindshake card game in order to make the process more apprehensible.

Table 7: Benchmarking of different communication support for DT models; developed by author

<b>The Double Diamond Model</b>	<b>IDEO HCD Model</b>	<b>d. School 5 Steps Model</b>	<b>FORTH Innovation Model</b>	<b>Evolution 6<sup>2</sup> Model</b>
<ul style="list-style-type: none"> <li>• Design Council Spark Program;</li> <li>• Case Studies;</li> <li>• Reports;</li> <li>• Guides;</li> </ul>	<ul style="list-style-type: none"> <li>• Software to scale Design Thinking;</li> <li>• The teachers guide;</li> <li>• Design Thinking for educators;</li> <li>• HCD toolkit;</li> <li>• Books;</li> <li>• Method Cards;</li> <li>• DT for Libraries;</li> <li>• Designing for public services;</li> </ul>	<ul style="list-style-type: none"> <li>• K12 Lab Network Resource Guide;</li> <li>• Put Design Thinking to Work;</li> <li>• Creative Confidence Map;</li> <li>• How to Kick Off a Crash Course;</li> <li>• d.school Reading List;</li> <li>• Make Space;</li> <li>• Liberatory Design Cards;</li> <li>• Playbook from Design;</li> <li>• Tech High School;</li> <li>• Empathy Techniques for Educational Equity;</li> <li>• Prototyping Dashboard;</li> <li>• "How Might We" Questions;</li> </ul>	<ul style="list-style-type: none"> <li>• The Innovation Expedition Map;</li> <li>• Free Printable Templates;</li> <li>• The Innovation Expedition Book;</li> </ul>	<ul style="list-style-type: none"> <li>• E6<sup>2</sup> booklet;</li> <li>• E6<sup>2</sup> templates;</li> <li>• E6<sup>2</sup> principles;</li> <li>• E6<sup>2</sup>card game;</li> <li>• E6<sup>2</sup> Evolution chair;</li> <li>• E6<sup>2</sup> D-Think Research Report;</li> <li>• D-Think Toolkit;</li> <li>• D-Think e-learning course;</li> </ul>

### 3.7 Models Analysis

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The benchmarking and analysis of different Design Thinking models show that although all models following the DT framework, steps, tools and techniques are still different and show different approaches. All models represent the combination of divergent and convergent thinking in certain stages of Design Thinking process and show structured approach towards effective combining creative and critical thinking (Onarheim and Friis-Olivarius, 2013). Both convergent and divergent thinking is equally important for the creative process, although divergent thinking allows people to think broad that eventually leads to novelty, and convergent thinking is more related to the usefulness of ideas.

Besides the deeper understanding of models, the conducted analysis and benchmarking are useful to understand how the different models are exploited and commercialised, in order to develop an effective commercialisation strategy for Evolution 6<sup>2</sup> model.

The Double Diamond Model origin comes from the charity so it is applied mostly in governmentally funded projects. The 3 I's model, proposed by IDEO, come from the company original specialisation — product design. Over the years the areas of IDEO's expertise significantly expanded, and the company expanded in sizes with offices in major cities in the USA and Europe. Although the model had been used widely beyond the company's walls, the facilitation of the process with a professional could be afforded mostly by big companies. Stanford's d. School Model was born in the academic environment and still follows mostly educational directions.

The main advantage of FORTH innovation methodology is that it provides organizations with a clear outcome and timeframe. All mini-business cases would be prepared according to the company's goals and objectives, and could sufficiently boost the innovative process within the organisation. The model's developer and facilitator, Gijs van Wulfen has an extensive working experience in different areas and have a trustworthy reputation in a business environment. Nevertheless, he provides lots of supportive tools for the model, it is still bulky for facilitation without professional supervision.

The Evolution 6<sup>2</sup> model origin rooted in extensive research and over the years it has been tested and proved in various industries. It is easily perceived visually and provides the wide range of supportive tools to make the whole process manageable even without the facilitator; it is created with user's visual perception in mind so could be easily understood and therefore used in practice. So whereas it seems to re-create the same Design Thinking framework as other models, the Evolution 6<sup>2</sup> making it in a unique way and that differentiate it. This would be helpful for further development of exploitation strategy and bring the strong points of the model to customers.

## IV. Case Study

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According to the research objectives, an applied research methodology had been chosen as soon as the research topic originated from practical context. Applied research is useful for solving certain problems by applying acknowledges theories and principles. The outcome of this type of research has immediate application.

The main difference between applied and basic research is the type of outcome. Basic research is aiming to find an information that has a wide base of application and eventually could add new value to the already existing scientific knowledge. Whereas applied research is directed towards finding the solution for a specific, practical problem and as a result tries to guide how things could be changed (Rajasekar, Philominathan & Chinnathambi, 2006). In this chapter is described the empirical setting for this research. Further the findings will be discussed and presented the set of propositions. This chapter would be concluded with study's limitations and directions for further research.

### 4.1 Objectives

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The principle goal of this research is the development of a complementary business model for the Design Thinking Evolution 6<sup>2</sup> model, related to the core business challenges inside the organisation in order to bring more value to it, and to use it for MINDSHAKE's consulting purposes, having in mind the vision and mission of the company.

#### Specific objectives of this chapter

- Explore The Evolution 6<sup>2</sup> model current business model exploitation;
- Adapt the technology-to-product-to-market framework for the Evolution 6<sup>2</sup> model;
- Develop a new complimentary business model for the Evolution 6<sup>2</sup> model aligned with market needs, having in consideration MINDSHAKE's specific context.

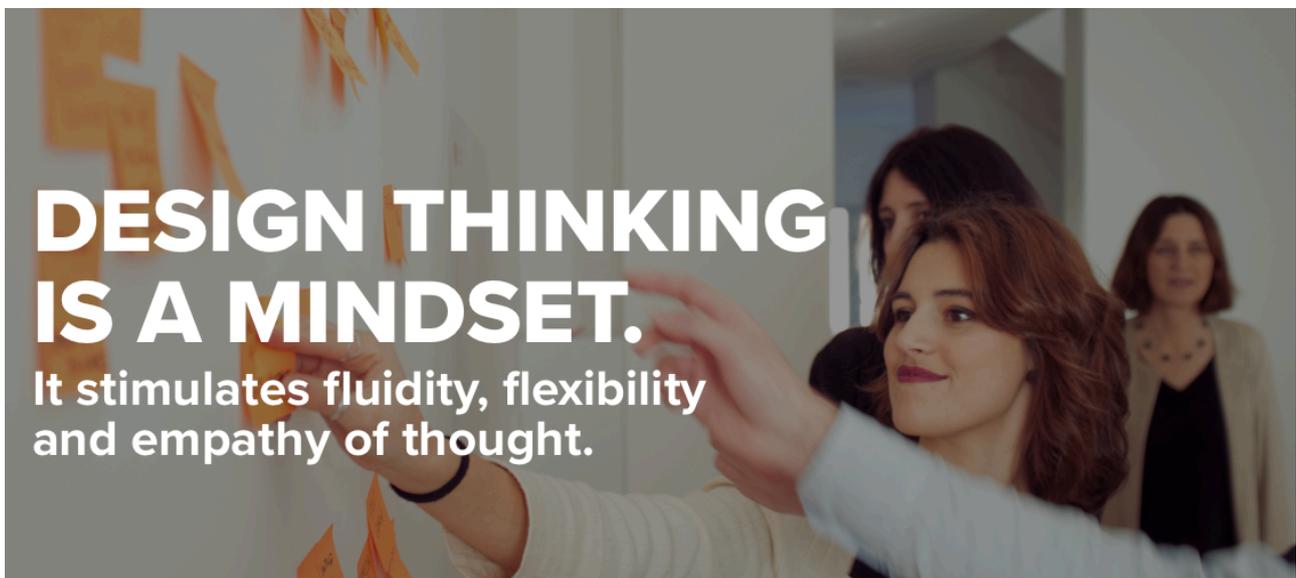
The Portuguese based Design Thinking consultancy MINDSHAKE were chosen as the empirical setting for this research. Considering the exploratory aims of research, an inductive case study approach had been chosen. Inductive studies allow the generation of new theories, emerging from the collected data according to research goals and objectives. Data were collected through: (1) literature review and analysis; (2) desk research (websites, reports, etc.); (3) interviews with MINDSHAKE founder Katja Tschimmel; (4) observation (events, behaviours and artefacts); (4) interviews with design-driven companies employees.

## 4.2 The Organisational Context of the Case Study

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### 4.2.1 MINDSHAKE

The research questions raised in this work emerged in the context of the company. The Portuguese company Na'Mente, Consultancy and Training in Creative Thinking and Design, was founded in April 2010 by Katja Tschimmel, and was launched in the market in 2015, with other name, MINDSHAKE to introduce a broader team of collaborators and with the aim of internationalisation. The team includes Katja Tschimmel as Design Thinking trainer and consultant, and Marianna Mattos, the in-house designer and Design Thinking facilitator. Since 2015, the company has been growing bigger in terms of professional partnerships and including people from different areas in the team.



”

*At Mindshake we see Design Thinking as a mindset which helps different ways of thinking, fluidly, flexibly and with empathy. Creative Thinking is thinking in variety, and in future possibilities; thinking against the norm and stereotypes; thinking differently, focused on objectives. Through products, services and events, MINDSHAKE seeks to promote and develop precisely these ways of thinking, and thus challenge the daily mental routine in organisations.*

— Source: Mindshake, 2017 <sup>5</sup>

Main services provided by the company is consultancy, training and event hosting.

**Consultancy** include management of creativity, ideation and coaching. Management of creativity as a service offers consultancy specialising in the promotion and management of creativity and creative thinking in organisations. This include focus on following areas: (1) raising awareness of the

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<sup>5</sup> MINDSHAKE. 2017.[ONLINE] Available at: <http://mindshake.pt/>. [Accessed 20 June 2017]

advantages and benefits of creativity in organisations; (2) promoting of a business culture which encourages collaborative and creative attitudes, and the generation of original ideas, relevant to innovation; (3) introducing conception of “made to measure” programmes and activities for the development of creativity in organisations; (4) analysis of the existent creative processes in work groups, with proposals for improvement, and (5) ideation service implies professional support for the creation of new concepts for products and services. Due to extensive partnership and network of contributors, ideation support include professionals from different creative areas: designers, artists, physicists, engineers, sociologists etc. Depending on the project and business area the composition of a team vary. With a view to improving the creative processes in organisations, MINDSHAKE provides coaching which facilitates group creativity. This includes the teaching of specific techniques, which ensure the development of the ability to apply the technique in a flexible, autonomous way.

**Training** activities include lectures, workshops, masterclasses and have under development a course for facilitators. Lectures happens due to constant invitations to speak at conferences on themes related to creativity, innovation, design, design thinking and entrepreneurship. Workshops had been developed for a particular situations and needs, whether institutional or business. MINDSHAKE has produced different models of workshop which vary in length (between 1 day and 3 months), in intensity (from 3 to 8 hours per day), and according to the particular subject in the creative world under consideration. Masterclasses had been presented in different academical institutions in various countries.

## 4.2.2 Implementing the Design Thinking approach in the companies

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Recent research conducted by McKinsey shows that 84% of global top managers agreed that innovation is important for business growth and development, and at the same time 94% were disappointed with their organisations' innovation performance (McKinsey Global Survey results, 2015). Even considering the enormous amount of data that companies could get about their clients, the innovation process is still struggle for some of them. Correlations or any patterns in numbers are great, but they doesn't prove the causal relationship between different factors. Knowing more about customers could be a misleading way of building an innovative strategies. What really helps in this process is to understand “what the customer hopes to accomplish” or in other words “job need to be done” (Christensen, Hall, Dillon and Duncan, 2016). Sometimes a traditional personas-based approach to segmentation isn't working and require to look at the last from several different angles. Good companies think about their customers. Great companies think about customers' needs and problems that need to be solved. And innovative companies think about needs and problems of the customers and those who haven't been using their product or service yet.



*Consulting is a long surviving discipline that has evolved through the years. It works best for the known problems of today that has potentially similar solutions applied earlier. When it comes to identifying problems of the future and solving it – a collaborative, prototype based, user centered and iterative approach of design thinking is more appropriate. I believe consulting itself will embrace design thinking for specific types of problems*

— Sunil Mishra<sup>6</sup>, 2015

One of the main objectives of Mindshake is to shift from training and to do more professional Design Thinking consulting work. During the last decade many people in business environment become aware about the Design Thinking consultancy advantages and possible application:

- Design Thinking professionals usually come from different backgrounds and therefore have different approaches towards problem-solving;
- traditional consultancies are known for solving the known problems considering past experience and knowledge, whereas the design thinking approach could be dealing also with future problems when problem solving processes require more an exploratory process; in this case past knowledge could be considered, but in general should be dropped in order to come up with innovative ideas;
- as soon as Design Thinking is an iterative process, the possible solution for the identified problem get changed during the prototyping/validation phase; so in this case the problem considered to be solved when the end user has adopted the solution in practice, which bring more reliable results for the companies;
- most of the companies are emphasising strategy whereas sometimes the whole strategic process should be more self-adjusting and evolutionary. In this case Design Thinking approach could help to adjust the processes inside the organisation making it more flexible but still bearing in mind the overall strategic goals of the company;

Design Thinking consultancy is helpful not only for solving, but also for identifying problems, considering its collaborative, iterative and user-centered approach. It is still important to keep in mind that for business culture accept the looping circularity of Design Thinking process is challenging and demand dedication from the managerial part of the company. Tim Brown recently noticed that only in few companies CEOs and managers accepted the mess that comes along with the DT process and this is where real innovation come from. And consequently the success rate for this process was low if the companies was trying to turn iterative nature of design processes into linear methodology.

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<sup>6</sup> Is Management Consulting contrarian to Design Thinking? 2015 [ONLINE] Available at: <https://goo.gl/GYZnQ7>. [Accessed 20 June 2017].

Considering all the advantages and drawbacks of implementing the Design Thinking practices, and Evolution 6<sup>2</sup> model in particular into the business environment, it is important to understand the business context and how it could be effectively merged into it. Design thinking could help companies to boost their vision and strategy, brand and company's identity, products and services produced by the company, improve user experience and innovate the inner culture. The goal is to explain and prove why investing in design and innovate strategically could significantly enhance the positioning on the market and also how to use it effectively. Lots of companies still don't make it a priority to invest in design mainly because of the complexity of measurement of its impact. The design-driven approach is extremely useful for long-term perspective, in comparison, for example, with data-driven approach that allows companies to identify the target audience for existing products and services. Creating new product or services and exploring new markets for it, require more innovative and design-oriented strategy for exploration.

Evolution 6<sup>2</sup> model as a product solve not an isolated problem, but problems that come with different contexts, actions, and circumstances. When clients come with a request to MINDSHAKE they tend to think that they re-delivered the problem to the company, whereas in reality, the main impact of Design Thinking coaching is the improved creative-confident mindset and the overall design-driven process.

### **4.3 Adaptation of TPM Framework for Evolution 6<sup>2</sup> Model**

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The TPM framework had been created in order to reduce the gap between technology sources and technology users. As a result there is a great amount of technologies that are developed without any commercial application (Markham and Kingon, 2004). The same tendency had been noticed in knowledge commercialisation (Boehm and Hogan, 2013). Over the decades knowledge that had been produced in any types of academic institutions stayed within the walls of universities and research centers without being practically applied. But during the last 20 years, the situation changed and knowledge producing companies take a role as agents of economic development for countries. This observation led to the assumption that the TPM framework could be used for knowledge-based product and services too. It is considered as an iterative decision tool so this was one of the main reasons why it has been picked for development of Evolution 6<sup>2</sup> model to market needs.

In order to make this shift, the possible technology capabilities should be substituted by knowledge capabilities. Knowledge capabilities could be identified as a "specific knowledge and resources possessed by an organisation, a group or an individual; it is these specific knowledge and resources that make the above capabilities hard to be replicated by competitors and so make the organisation, group or individual competitive" (Ning et al, 2006). According to some authors (Petroni, 1998; Quinn et al, 1996.), knowledge capability could be viewed in 2 dimensions: as a collective knowledge

capability that is owned by a company or a group and individual knowledge capability that is owned by an individual. For this research knowledge capabilities will be discussed from both perspectives.

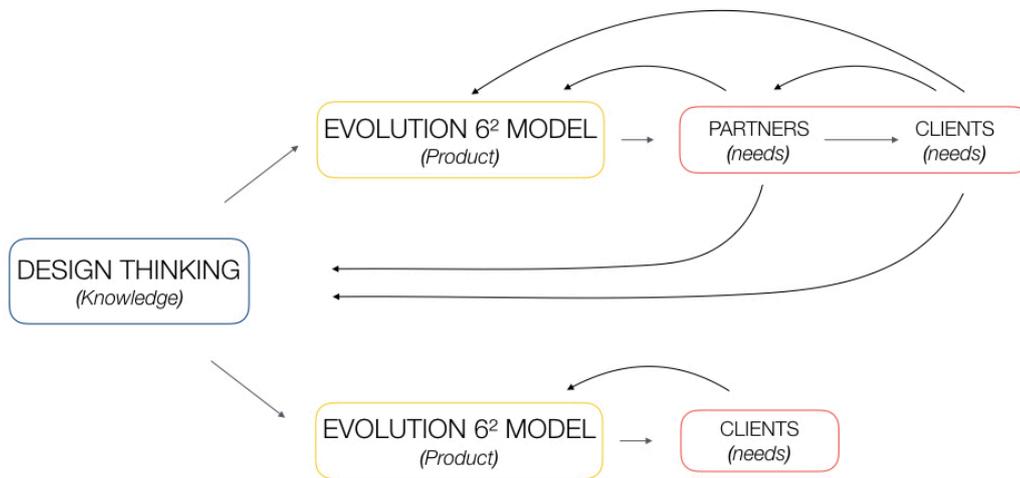


Figure 16: Using TPM framework for knowledge-based Evolution 6<sup>2</sup> Design Thinking model exploitation; developed by author

The Evolution 6<sup>2</sup> is a creative process model that could be applied to any type of the business and organisation in order to boost transformation and innovation. The future business model exploitation model had been decided to base on technology-to-product-to-market framework. To make this transformation, the comparison between technology and knowledge had been made. Also, to achieve this goal it would be needed to identify DT knowledge capabilities, Evolution 6<sup>2</sup> model features and explore the need of potential customers and users of the model.

Analysing the case study context it becomes evident that currently, due to established trust and networking, clients are usually contact in MINDSHAKE. According to their requests — either from clients, or from partners, the model could be adjusted with additional tools and techniques. Moreover, it could be complemented with knowledge and methodologies from other areas, for example, LEAN Startup methodology or from business coaching. This circulative nature also is reflected in the adapted model. The resulted knowledge-to-product-to-market (KPM) framework would be a theoretical and practical base for the complementary business model for Evolution 6<sup>2</sup> exploitation strategy.

## 4.4 Current Business Model Canvas for Evolution 6<sup>2</sup> Design Thinking model

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The Evolution 6<sup>2</sup> model is widely used in MINDSHAKE's consultancy and training activities. The business Model Canvas is an effective, visual tool for understanding current service structure and its key constituents. Breaking through these considerations, impacting the business would be helpful in order to understand which key activities could be modified.

**Value Proposition** Evolution 6<sup>2</sup> is a Design Thinking model, created for any types of businesses and organizations in order to boost transformation and innovation by a systematic process.

---

### Infrastructure

#### *Key Partners:*

- freelance facilitators;
- academic and governmental institutions;
- associations;

#### *Key Activities:*

- consultancy;
- training;

#### *Key Resources:*

- physical (Mindshake House, Card Game, templates etc.);
  - intellectual (Design Thinking expertise);
  - human resources (employees knowledge and experience);
- 

### Customers

#### *Customers Relationships*

- online promotion: website / social networks;
- networking;
- Creative Commons International License in the version 'by-sa';

#### *Customer Segments*

- academic environment;
- business environment:
  - human resources;
  - innovation department;
  - executive managers;
  - design/marketing/development department employees;

#### *Distribution Channel*

- website / social networking;
  - partnering organizations;
  - networking: (workshops, academic background, event hosting);
-

## Finance

### *Cost Structure*

operating expenses;

### *Revenue streams*

- teaching and training;
  - coaching;
  - selling the Evolution 6<sup>2</sup> card game;
- 

Currently due to established trust and networking clients are usually contacted the MINDSHAKE and this workload is suitable for the company's resources with only two people. In case if the company would like to grow, promote more services and assist more organisations it would be needed to widen the sources.

#### 4.4.1 SWOT Analysis Evolution 6<sup>2</sup> Design Thinking Model

SWOT attends for acronym Strength, Weaknesses, Opportunities and Threats. Originally developed for business industries, it is equally useful for other industries, such as health, education, public services and others. The main goal of SWOT analysis is to help reveal strong sides that work together and identify potential problems that possibly needed to be addressed or re-considered. It is also useful for developing a potential strategy by: (1) using the strengths and overcoming weaknesses by taking advantage of opportunities; (2) using strengths and minimize weaknesses to avoid threats.

Table 8: SWOT analysis for Evolution 6<sup>2</sup> Design Thinking Model; developed by author

Strength	Weaknesses
<ul style="list-style-type: none"> <li>• strong academical research background</li> <li>• “everybody is a client” approach: model could be applied in a wide variety of areas;</li> <li>• visually appealing and easy to use;</li> <li>• flexible for changes and adjustable for various industries according to requested objectives;</li> <li>• provide 6 tools for each stage;</li> <li>• developed and implemented in single Design Thinking consultancy company in Portugal;</li> </ul>	<ul style="list-style-type: none"> <li>• recently emerged trend — lack of awareness about the topic and how it could be used for business;</li> <li>• tough to measure outcome: not always companies might have ground-breaking ideas;</li> <li>• changes in mindset took time and regular practical use of the model;</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• trustworthy due to academical background of Katja Tschimmel;</li> <li>• importance of experiencing of DT process</li> <li>• during the process people getting more involved and motivated;</li> <li>• companies get more and more aware about the importance of DT for successful innovation</li> </ul>	<ul style="list-style-type: none"> <li>• more recognisable competitors (like IDEO or Stanford d.School model);</li> <li>• common misconception that “Design Thinking” is solely for creative industries;</li> </ul>

The analysis of weaknesses and threats is useful for turning them into opportunities. From analysis it is evident that a wide audience has a broad perception of Design Thinking in general, and about Evolution 6<sup>2</sup> in particular. That is why it would be useful to make the DT knowledge closer to potential customers and explain how companies might benefit from using Evolution 6<sup>2</sup> in practice. Also whereas the model compete with such giants, like IDEO and Stanford d. School, it provides more structured, systemised and visually appealing approach.

## 4.4.2 Questions for successful business model innovation | Current state

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The thought-out value proposition is the key factor for successful connection of products with markets. The whole value architecture including the product itself, the revenue model and the team & values — all have to deliver the value. Studying in details all of these factors allows to understand which of these components could be improved or replaced, and which make the key role in value creation.

From the moment of its creation until the current state, the Evolution 6<sup>2</sup> model evolved and expanded areas of its implementation. The latest version include few techniques that are universal for other fields, and this helps Evolution 6<sup>2</sup> be more flexible and adjustable towards the tasks and problems it is applied.

### **Team and Values** • **Team:** *who is in the team? what competencies the team has?*

— There are two constant members of the team: Katja Tschimmel and Marianna Mattos. Whereas MINDSHAKE has five other partners as a Design Thinking facilitators.

### • **Values:**

— *What values the company pursue?*

Through products, services and events, Mindshake seeks to promote and develop precisely creative and design ways of thinking, and thus challenge the daily mental routine in organisations.

— *How do the the interact with each other and the customers?*

For creative and Design Thinking services it is really important the personal communication with clients, so usually after the companies contact the MINDSHAKE, they are proposed to meet in the office in order to better understand the cooperation process. Also educational workshops provided through partnering organisations connect MINDSHAKE with clients. In addition, company hosting various events, where people from different industries could meet and experience different DT-related practices.

Internally, Katja Tschimmel and Marianna Mattos keep working on the Evolution 6<sup>2</sup>, making it more suitable for partners and clients needs.

## Value Architecture

- **Offer:** *what is the company's offer?*
  - Evolution 6<sup>2</sup> is a design thinking model used in the development of projects, workshops, coaching sessions, investigative projects, methodology lessons, among others.
- **Core Capabilities:** *what are the core capabilities company need?*
  - The Evolution 6<sup>2</sup> model grounded research base;
  - Individual: Katja Tschimmel academic experience in research and teaching additionally to professional networking; Marianna Mattos experience in communication design;
  - Collective: Professional experience gained as a team during the work
- **Distribution and Communication Channels:** *how do company reach customers? how do company communicate with customers?*
  - through established partnerships with organisations;
  - through professional and academic networks;
  - through online presence: website and social networks
- **Partners:** *which partners the company might need?*
  - Facilitators from different areas of expertise;
  - Institutions (like APGEI, INESC Tec and UPTEC);

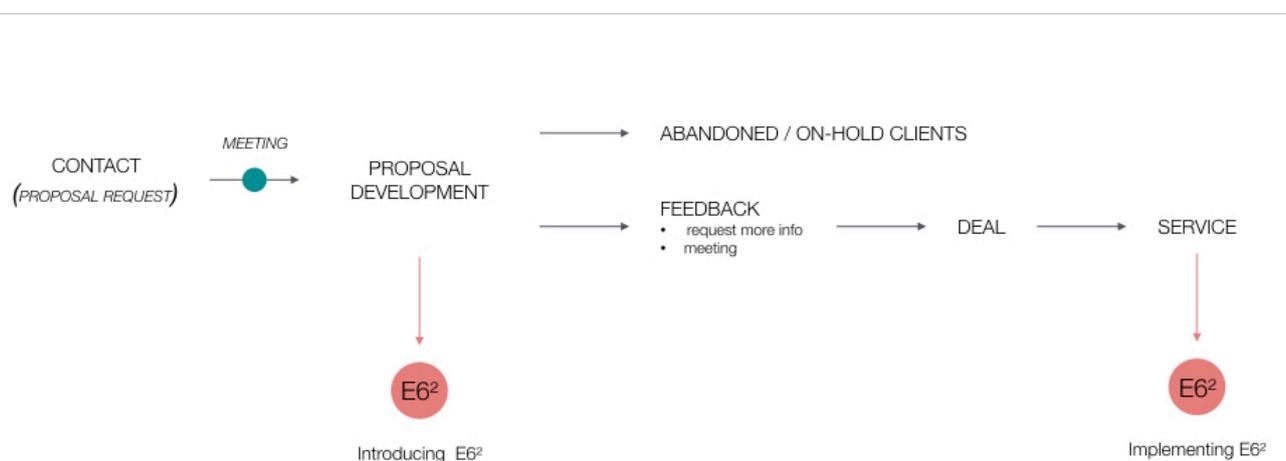


Figure 17: Value Chain for The Evolution 6<sup>2</sup> in MINDSHAKE context, developed by author

## Value Proposition

- **Customers: who are the customer?**

— At this point main source of customers is a wide professional and academic network established by Katja in different areas. Currently organisations contacting Mindshake and either request proposals in general or regarding specific problem inside the companies. Usually contact is made by human resource manager, innovation department manager or CEO of the company.

- **what job the company solve for customers?**

— Depends on the type of service that were requested by the clients: nevertheless Evolution 6 model used to make the creative and design thinking approach more systematic. In case if clients requested a design thinking coaching usually it is related to a specific issue that the company has. Then the primary outcome would be the possible solution of the issue and secondary, additionally changed mindset of the employees, that experienced the design thinking process itself. In case if clients requested a training — usually it has a form of a workshop with timeframe from 4 hours to 3 days — then the primary outcome would be a more creative confident mindset and secondary the ideas for innovation.

- **Customer Benefit: what benefit do company create for customers? what benefit do company create for partners?**

— The benefit for our customers also depends on the provided service. Firstly, it is a changed mindset which helps different ways of thinking, fluidly, flexibly and with empathy and thinking in variety. Secondly, its a possible solution for the task that was requested to solve with a design thinking approach.

Table 9: Different types of outcomes for clients depending on Mindshake provided service; developed by author

Type of Service	Main outcome	Secondary Outcome
Training Workshop (from 4 hours till 3 days)	<ul style="list-style-type: none"> <li>• Learning of design thinking;</li> <li>• More creative mindset;</li> </ul>	Innovative Ideas;
Coaching (depends on the project)	Innovative ideas in a company's context;	<ul style="list-style-type: none"> <li>• Learning of design thinking;</li> <li>• More creative Mindset;</li> </ul>

To make the outcome of the work with Design Thinking methods and Evolution 6<sup>2</sup> model more practical, it was proposed to analyse what clients are looking for when they are contacting the MINDSHAKE. For that reason, it was decided to contact the companies and through interviews understand, what their most common challenges are and how this challenges usually overcome by the company. Interviews were chosen as a technique in order to collect accurate data from respondents, such as people's motives, attitudes and behaviours. The preference was given to semi-structured interviews — the questions were prepared in a way to allow respondents to express themselves at length (see Appendix C).

”

*The first big challenge was to get mentors to help us building a business — how to monetise product and how to build a business model. The second challenge was to build a team and to scale it. Fundraising always was a challenge. And last big challenge was the technology: how to address different technology stacks and make them work together.*

*The evolution of the business happen pretty much from everywhere. First of all market and partners feedback. Internally it is more about the answer to these feedback — from developers, from me, from my co-founder Miguel. We have discussions trying to understand how we could transfer this feedback into a product or into a feature of a product.*

*Design Thinking is our basic approach, we are problem-solving company so we start with user stories and user problems. We try to understand how we could fix these problems for the users or how to make them at least easier to accomplish. We involve everyone in the team and brainstorm a lot.*

— Nelson Pereira, Co-founder & CEO of Topdox

”

*Sometimes the team members suggest some alternatives, and my role there is to make a decision regarding its development and implementation. Human resources are usually involved in process of making people more pro-active and making sure that they would be comfortable to share their thoughts related to product we are working on.*

— Valter Henriques, CEO at Shortcut

## 4.5 Complementary Design Thinking Tools for Different Innovation Types

Based on a previous research, it was decided to study the challenges that companies might face and that could be approached with a Design Thinking methodology and Evolution 6<sup>2</sup> in particular. The main outcome of the DT consultancy is innovative ideas in a company's context, and both CEO's highlighted the importance of product/service, marketing and organisational innovation for their business. Following MINDSHAKE goal to shift from training to consultancy, it would be logical to target the business-to-business (B2B) sector and help these clients to reach their customers (B2C). In order to understand business needs besides interviews, media research was conducted. Following this, various activities for business were selected and organised according to the types of innovation.

Table 10: Possible solution according to types of innovation; developed by author

Innovation Types		Possible Solutions
Product Innovation	<ul style="list-style-type: none"> <li>• <i>product performance</i></li> <li>• <i>product system</i></li> <li>• <i>service</i></li> </ul>	<ul style="list-style-type: none"> <li>• get customers feedback;</li> <li>• understand customer behaviour;</li> <li>• customer development;</li> <li>• product/service concept validation;</li> <li>• product/service assumption validation;</li> <li>• product/service functionality development;</li> <li>• developing visual perception of product;</li> <li>• concepts testing;</li> <li>• developing an additional/complemental service for already existing one;</li> </ul>
Process Innovation	<ul style="list-style-type: none"> <li>• <i>process</i></li> </ul>	<ul style="list-style-type: none"> <li>• value chain improvement/development</li> </ul>
Marketing Innovation	<ul style="list-style-type: none"> <li>• <i>channel</i></li> <li>• <i>brand</i></li> <li>• <i>customer engagement</i></li> </ul>	<ul style="list-style-type: none"> <li>• “going to the market” strategy</li> <li>• brand vision/positioning/differentiation;</li> <li>• media research (combined with competitors analysis);</li> <li>• global scale scenario planning (with multiple visions how it might change);</li> <li>• content creation (for bringing company's vision to customers);</li> <li>• commercialisation strategy;</li> <li>• service community creation;</li> </ul>
Organisation Innovation	<ul style="list-style-type: none"> <li>• <i>profit model</i></li> <li>• <i>network</i></li> <li>• <i>structure</i></li> </ul>	<ul style="list-style-type: none"> <li>• new market development/understanding/exploitation/acquisition;</li> <li>• client approaching strategy;</li> <li>• grown-oriented (for SME in order to expand);</li> <li>• departments collaboration improvement;</li> <li>• partners collaboration development;</li> </ul>

Following this, the researcher proposed for each innovation type, complementary tools from DT methodologies. All of the new tools, are different from those tools, that are already part of the Evolution 6<sup>2</sup> model. The tools were chosen in order to make approach toward innovation process more measured, systematic and scientific. Design Thinking methods allow companies to shift from incremental or sometimes random improvements, towards real breakthroughs. This changes eventually bring value both for customers and for organizations.

*Table 11: Evolution 6<sup>2</sup> Model Complemental Additional Tools according to types of innovation; developed by author*

<b>Product Innovation</b>	<b>E6<sup>2</sup> Complemental Additional Tools</b>
<ul style="list-style-type: none"> <li>• <i>product performance</i></li> <li>• <i>product system</i></li> <li>• <i>service</i></li> </ul>	
1 get customers feedback;	<ul style="list-style-type: none"> <li>• <i>creating future outcome feedback framework (Kumar, 2012, p. 205)</i></li> <li>• <i>mapping the experience of the issue (Kumar, 2012, p. 231)</i></li> <li>• <i>contextual interviews (Stickdorn et al., 2011, p. 162-163)</i></li> </ul>
2 understand customer behaviour;	<ul style="list-style-type: none"> <li>• <i>five human factors (Kumar, 2012, p. 103)</i></li> <li>• <i>POEMS (Kumar, 2012, p. 105)</i></li> <li>• <i>Ethnographic interview (Kumar, 2012, p. 111)</i></li> </ul>
3 customer development;	<ul style="list-style-type: none"> <li>• <i>ERAF systems diagrams (Kumar, 2012, p. 147)</i></li> <li>• <i>descriptive value web (Kumar, 2012, p. 151)</i></li> <li>• <i>activity network (Kumar, 2012, p. 167)</i></li> <li>• <i>user group definitions (Kumar, 2012, p. 177)</i></li> </ul>
4 product/service concept validation;	<ul style="list-style-type: none"> <li>• <i>solution roadmap (Kumar, 2012, p. 277)</i></li> <li>• <i>user journey map (Kumar, 2012, p. 183)</i></li> <li>• <i>principles to opportunities (Kumar, 2012, p. 205)</i></li> </ul>
5 product/service assumption validation;	<ul style="list-style-type: none"> <li>• <i>solution diagramming (Kumar, 2012, p. 267)</i></li> <li>• <i>solution enactment (Kumar, 2012, p. 271)</i></li> <li>• <i>solution evaluation (Kumar, 2012, p. 275)</i></li> </ul>
6 product/service functionality development;	<ul style="list-style-type: none"> <li>• <i>problem/proposition definition (Kimbell, 2014, p. 125)</i></li> <li>• <i>opportunity mapping (Kumar, 2012, p. 119)</i></li> <li>• <i>mapping the user experience (Kumar, 2012, p. 89)</i></li> </ul>
7 developing visual perception of product;	<ul style="list-style-type: none"> <li>• <i>image sorting (Kumar, 2012, p. 117)</i></li> <li>• <i>popular media search (Kumar, 2012, p. 63)</i></li> <li>• <i>convergence map (Kumar, 2012, p. 41)</i></li> </ul>
8 concepts testing;	<ul style="list-style-type: none"> <li>• <i>sketching touchpoint (Kimbell, 2014,</i></li> <li>• <i>desktop walkthrough (Stickdorn et al., 2011, p. 190-191)</i></li> <li>• <i>co-creation (Stickdorn et al., 2011, p. 198-199)</i></li> </ul>

- |   |  |  |
|---|--|--|
| 9 | developing an additional/<br>complemental service for already<br>existing one; | <ul style="list-style-type: none"> <li>• <i>prescriptive value web</i> (Kumar, 2012, p.261)</li> <li>• <i>concept linking map</i> (Kumar, 2012, p. 263)</li> <li>• <i>visualising drivers for change</i> (Kimbell, 2014, p. 57)</li> </ul> |
|---|--|--|

## Process Innovation

- |   |   |   |
|---|---|---|
| 1 | value chain improvement/<br>development | <ul style="list-style-type: none"> <li>• <i>Agile development</i> (Stickdorn et al., 2011, p. 196-197)</li> <li>• <i>desktop walkthrough</i> (Stickdorn et al., 2011, p. 190-191)</li> <li>• <i>co-creation</i> (Stickdorn et al., 2011, p. 198 - 199)</li> </ul> |
|---|---|---|

## Marketing Innovation

- *channel*
- *brand*
- *customer engagement*

- |   |   |   |
|---|---|---|
| 1 | “going to the market” strategy  | <ul style="list-style-type: none"> <li>• <i>platform plan</i> (Kumar, 2012, p. 297)</li> <li>• <i>implementation plan</i> (Kumar, 2012, p. 307)</li> <li>• <i>trend expert interview</i> (Kumar, 2012, p. 31)</li> </ul>                          |
| 2 | brand vision/positioning/<br>differentiation;                                     | <ul style="list-style-type: none"> <li>• <i>vision statement</i> (Kumar, 2012, p. 315)</li> <li>• <i>innovation brief</i> (Kumar, 2012, p. 319)</li> <li>• <i>value hypothesis</i> (Kumar, 2012, p. 209)</li> </ul>                               |
| 3 | media research (combined with<br>competitors analysis);                           | <ul style="list-style-type: none"> <li>• <i>key facts</i> (Kumar, 2012, p. 27)</li> <li>• <i>innovation sourcebook</i> (Kumar, 2012, p. 29)</li> <li>• <i>competitors/complimentors map</i> (Kumar, 2012, p. 75)</li> </ul>                       |
| 4 | global scale scenario planning<br>(with multiple visions how it<br>might change); | <ul style="list-style-type: none"> <li>• <i>foresight scenario</i> (Kumar, 2012, p. 265)</li> <li>• <i>strategy roadmap</i> (Kumar, 2012, p. 295)</li> <li>• <i>customer lifecycle</i> (Stickdorn et al., 2011, p. 210-211)</li> </ul>            |
| 5 | content creation (for bringing<br>company’s vision to customers);                 | <ul style="list-style-type: none"> <li>• <i>POEMS</i> (Kumar, 2012, p. 105)</li> <li>• <i>ethnographic interview</i> (Kumar, 2012, p. 111)</li> <li>• <i>user journey map</i> (Kumar, 2012, p. 183)</li> </ul>                                    |
| 6 | commercialisation strategy;   | <ul style="list-style-type: none"> <li>• <i>financial profile</i> (Kumar, 2012, p. 71)</li> <li>• <i>analogous models</i> (Kumar, 2012, p. 73)</li> <li>• <i>roadmap</i> (Phaal et al., 2001)</li> </ul>  |
| 7 | service community creation;   | <ul style="list-style-type: none"> <li>• <i>offering, activity, culture map</i> (Kumar, 2012, p. 47)</li> <li>• <i>user groups definitions</i> (Kumar, 2012, p. 177)</li> <li>• <i>compelling experience map</i> (Kumar, 2012, p. 179)</li> </ul> |

## Organisation Innovation

- *profit model*
- *network*
- *structure*

1	new market development/ understanding/exploitation/ acquisition;	<ul style="list-style-type: none"> <li>• <i>competitors/complimentors map (Kumar, 2012, p. 75)</i></li> <li>• <i>industry diagnostics (Kumar, 2012, p. 79)</i></li> <li>• <i>SWOT analysis (Kumar, 2012, p. 81)</i></li> <li>• <i>initial opportunity map (Kumar, 2012, p. 45)</i></li> </ul>
2	client approaching strategy;	<ul style="list-style-type: none"> <li>• <i>five human factors (Kumar, 2012, p. 103)</i></li> <li>• <i>user journey map (Kumar, 2012, p. 183)</i></li> <li>• <i>Compelling experience map (Kumar, 2012, p. 179)</i></li> </ul>
3	grown-oriented (for SME in order to expand);	<ul style="list-style-type: none"> <li>• <i>research participant map (Kumar, 2012, p. 97)</i></li> <li>• <i>SWOT analysis (Kumar, 2012, p. 81)</i></li> <li>• <i>value hypothesis (Kumar, 2012, p. 209)</i></li> <li>• <i>innovation evolution map (Kumar, 2012, p. 69)</i></li> </ul>
4	departments collaboration improvement;	<ul style="list-style-type: none"> <li>• <i>competencies plan (Kumar, 2012, p. 311)</i></li> <li>• <i>team formulation plan (Kumar, 2012, p. 79)</i></li> <li>• <i>descriptive value web (Kumar, 2012, p. 151)</i></li> </ul>
5	partners collaboration development;	<ul style="list-style-type: none"> <li>• <i>ERAF systems diagram (Kumar, 2012, p. 147)</i></li> <li>• <i>five human factors (Kumar, 2012, p. 103)</i></li> <li>• <i>research participant map (Kumar, 2012, p. 97)</i></li> </ul>

Most of the tools were picked from Vijay Kumar book "101 design methods: A structured approach for driving innovation in your organisation" (2012). This tools could be assigned to various stages of Evolution 6<sup>2</sup> model. This more specific approach towards the company's innovation needs and goals could make the outcome of the coaching or training more tangible and bring more value to MINDSHAKE.

Moreover, during the case study research in MINDSHAKE, the author of this work was working on an adapted comparison of Lean Startup and Design Thinking methodologies based on the analysis conducted by Mueller and Thoring in 2012. This comparison also showed that Design Thinking techniques, and Evolution 6<sup>2</sup> model, could be effectively used as a complementary tool for various types of approaches towards innovation and business process. As a result in a final Complementary Business Model Canvas reflected possible useful partnerships, that could bring new potential customer segments, key activities and distribution channels, and, as a result, revenue streams.

### 3.6 Complementary Business Model Canvas for Evolution 6<sup>2</sup> DT model

Table 12: Complementary Business Model Canvas for Evolution 6<sup>2</sup> DT model; developed by author

**Value Proposition** Evolution 6<sup>2</sup> is a Design Thinking model, created for any types of businesses and organizations in order to boost transformation and innovation by a systematic process.

#### Infrastructure

##### **Key Partners:**

- freelance facilitators;
- academic and governmental institutions;
- associations;
- experts from different areas of expertise;
- lean/agile specialists partnerships;
- professional business consultants;
- business consultant agencies for projects collaborations;
- governmental organizations;

##### **Key Activities:**

- consultancy
- training

##### **Key Resources:**

- physical:
  - Mindshake House;
  - Card Game;
  - templates;
  - case study updates;
  - proposals for various innovation types, according to business needs and goals;
- intellectual (Design Thinking expertise);
- human resources (employees knowledge and experience);
- complementary partnerships;

##### **For expanded resources (more than 2 constant employees):**

- human resources
  - communication design expert;
  - more trained DT facilitators;
  - business consultant;
- intellectual (Communication Design expertise, Business Administration expertise);

## Customers

### *Customers Relationships*

- online promotion: website / social networks;
- networking;
- partnerships;
- creative Commons International License in the version 'by-sa';

### *Customer Segments*

- academic environment;
- business environment:
  - human resources;
  - innovation department;
  - executive managers;
  - design/marketing/development department employees;
- partnership cooperation;
- governmental services;

### *Distribution Channel*

- website / social networking;
  - partnering organizations;
  - networking: (workshops, academic background, event hosting);
  - direct reach for potential clients: proposal presenting
- 

## Finance

### *Cost Structure*

operating expenses;

### *Revenue streams*

- teaching and training;
  - coaching and consultancy;
  - partnerships
- 

The proposed Business Model Canvas was developed keeping in mind the iterative nature of knowledge-to-product-to-market framework. In MINDSHAKE's case, the Design Thinking knowledge resulted the invention of Evolution 6<sup>2</sup> model. This model had been successfully applied in academic and business environment. This approach is relevant to MINDSHAKE's current resources and work load that could be sufficiently managed. Whereas, in order to grow, MINDSHAKE were proposed to identify and address the various business needs and challenges that companies might be facing. Design Thinking Mindset is hard to measure whereas it could bring significant contribution to the company intellectual assets and could stimulate innovation development within the company. For this reason, it was suggested to complement basic Evolution 6<sup>2</sup> model tools with additional ones, that could bring more tangible outcome for the companies in each particular business case.

## V. Conclusions

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This research aimed to answer 3 main questions: (1) is there a difference between technology and knowledge exploitation; (2) how to use the technology-to-product-to-market framework (TPM) for process model exploitation; and, (3) how to develop an exploitation strategy for the Evolution 6<sup>2</sup> DT process model.

Based on an analysis of the literature, it becomes evident that the main difference between terms “technology” and “knowledge” is that technology is a more static and tangible form of knowledge. Knowledge is broader and more flexible, has lots of different forms and exists in people’s minds. This comparison was made in order to show that the technology-to-product-to-market framework could be successfully adapted for a process model, such as The Evolution 6<sup>2</sup> Design Thinking model, exploitation. The Evolution 6<sup>2</sup> model emerged from extensive academical research and is grounded on Design Thinking knowledge. The TPM adaptation was made in order to prepare an exploitation strategy for this model. As a result, a knowledge-to-product-to-market framework was developed.

From the analysis of innovation types, it was concluded that it is not only knowledge captured in products that affects the market landscape. Understanding customers challenges, behaviours, and motivations could affect and broaden already existing knowledge and affect the products. This iterative process was also reflected in a developed knowledge-to-product-to-market framework, and helped to guide further research.

The literature review shows that Design Thinking is an effective approach towards innovation and problem-solving. It could be implemented by different types of industries, and for various tasks. However, these advantages are still not that evident for some business managers or industries. Therefore, the objective of this research was to develop a complementary business model for the Evolution 6<sup>2</sup> model using the knowledge-to-product-to-market approach. The model is widely used in various contexts, although the potential scope of its implementation is much wider than that currently in use. This research was conducted in order to bring increased value to the model and to develop a more commercialised approach towards its exploitation.

The Business Model Canvas was chosen as a theoretical base for further inductive case study research. Based on interviews and observations, researchers proposed a list of various business challenges related to different types of innovation, and which would be effective for companies. For each challenge, a supportive toolkit with Design Thinking techniques was proposed. As a result, a complementary business model with additional DT tools, each related to the types of innovation a company would be dealing with, were developed. This model also aimed to achieve another practical goal: by employing a more commercial approach towards the Evolution 6<sup>2</sup> model exploitation, to bring more coaching activities to MINDSHAKE, to replace training.

The business model proposes to focus more on market needs and to develop new partnerships. To achieve this, MINDSHAKE will need to develop new supporting materials and to complement existing knowledge and expertise with professional partnerships from other areas. Also, it is proposed to extend the area of expertise and invite other professionals, such as communication designer or business consultant, as a part of the team. This will also allow the range of the company's services to increase.

## 5.1 Limitations of the work

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The limited time available could be considered as a limitation on this research. An appropriate and valid measurement of the Design Thinking impact on company's performance requires a long-time perspective, because the breaking innovation ideas do not always appear during the DT training or coaching sessions. The main outcome of these activities is changing the mindset of people who experience the Design Thinking process. During the interviews, it also became evident that respondents are aware of Design Thinking techniques and practice them for a specific company's goals, whereas, the interviewees are the founders of innovative technology companies, who are constantly dealing with turbulent market environment. This observation leads to conclusion that there is a need to educate and promote DT approach across various areas and industries. So, as a result, the target audience shouldn't be limited by innovation-driven companies, but all types of businesses. Another limitation could be considered the amount of the interviews and the interviewed respondents. Both of them are working in innovative, start-up environment and are aware about the possible effectiveness of DT methods for their businesses.

## 5.2 Future work

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The objectives for further work would be primarily testing the proposed business model in an MINDSHAKE organisational context. The goal of the developed business model is to help MINDSHAKE to shift from training into consultancy. In order to attain this goal, a wider time frame is required.

Also, additional tools for specific types of innovation could be adjustable, and it would be valuable to test various Design Thinking techniques depending on required innovation type. Further, it would be useful to develop a set of practically tested and evaluated tools for business needs.

# Bibliography

1. Argote, L. and Ingram, P., 2000. Knowledge transfer: A basis for competitive advantage in firms. *Organizational behavior and human decision processes*, 82(1), pp.150-169.
2. Baregheh, A., Rowley, J. and Sambrook, S., 2009. Towards a multidisciplinary definition of innovation. *Management decision*, 47(8), pp.1323-1339.
3. Boehm, D.N. and Hogan, T., 2013. Science-to-Business collaborations: A science-to-business marketing perspective on scientific knowledge commercialisation. *Industrial Marketing Management*, 42(4), pp.564-579.
4. Boguslauskas, V. and Kvedaraviciene, G., 2015. Difficulties in identifying Company's Core Competencies and Core Processes. *Engineering Economics*, 62(2).
5. Bontis, N., 2001. Assessing knowledge assets: a review of the models used to measure intellectual capital. *International journal of management reviews*, 3(1), pp.41-60.
6. De Mozota, B.B., 2003. Design management: using design to build brand value and corporate innovation. Skyhorse Publishing Inc..
7. Buchanan, R., 1992. Wicked problems in design thinking. *Design issues*, 8(2), pp.5-21.
8. Calabretta, G., Gemser, G., Wijnberg, N. and Hekkert, P.P.M., 2012. Improving innovation strategic decision-making through the collaboration with design consultancies. In *Leading innovation through design: Proceedings of the 2012 DMI international research conference, Boston (USA), 8-9 Aug. 2012*. DMI.
9. Christensen, C.M., Hall, T., Dillon, K. and Duncan, D.S., 2016. Know your customers' "Jobs to Be Done". *Harvard Business Review*, 9, pp.54-62.
10. Clemente, V., Vieira, R. and Tschimmel, K., 2016, October. A learning toolkit to promote creative and critical thinking in product design and development through Design Thinking. In *Engineering Education (CISPEE), 2016 2nd International Conference of the Portuguese Society for* (pp. 1-6). IEEE.
11. Collins, H., 2010. Creative research: the theory and practice of research for the creative industries. Bloomsbury Publishing.
12. Council, U.D., 2007. The value of design fact-finder report.
13. Cropley, A., 2006. In praise of convergent thinking. *Creativity research journal*, 18(3), pp.391-404.
14. Daft, R.L. and Weick, K.E., 1984. Toward a model of organizations as interpretation systems. *Academy of management review*, 9(2), pp.284-295.

15. Dijksterhuis, E. and Silviu, G., 2017. The Design Thinking Approach to Projects. *The Journal of Modern Project Management*, 4(3).
16. Dorst, K., 2011. The core of 'Design Thinking' and its application. *Design studies*, 32(6), pp. 521-532.
17. Drucker, P. F. (1984). Our entrepreneurial Economy, *Harvard Business Review*, HBS Number: 84105.
18. Drucker, P.F., 1994. The theory of the business. *Harvard business review*, 72(5), pp.95-104.
19. Drucker, P.F., 1995. The new productivity challenge. *Quality in Higher Education*, 37, pp.45-53.
20. Francis, D. and Bessant, J., 2005. Targeting innovation and implications for capability development. *Technovation*, 25(3), pp.171-183.
21. Garavelli, A.C., Gorgoglione, M. and Scozzi, B., 2002. Managing knowledge transfer by knowledge technologies. *Technovation*, 22(5), pp.269-279.
22. Gurusamy, K., Srinivasaraghavan, N. and Adikari, S., 2016, July. An integrated framework for design thinking and agile methods for digital transformation. In *International Conference of Design, User Experience, and Usability* (pp. 34-42). Springer International Publishing.
23. Hammer Michael. Reengineering work: Don't Automate, Obliterate. *Harvard Business Review* 1990.
24. Keeley, L., Walters, H., Pikkell, R. and Quinn, B., 2013. *Ten types of innovation: The discipline of building breakthroughs*. John Wiley & Sons.
25. Kimbell, L., 2014. *The service innovation handbook: action-oriented creative thinking toolkit for service organizations*. BIS publishers.
26. Kumar, V., 2012. *101 design methods: A structured approach for driving innovation in your organization*. John Wiley & Sons.
27. Leonard-Barton, D., 1995. Wellsprings of Knowledge. *Harvard Business School Press*, Boston.
28. Markham, S.K. and Kingon, A.I., 2004. Turning technical advantage into product advantage. *The PDMA ToolBook*, 2, pp.71-91.
29. Martin, R.L., 2009. The design of business: Why design thinking is the next competitive advantage. *Harvard Business Press*.
30. McOmber, J.B., 1999. Technological autonomy and three definitions of technology. *Journal of communication*, 49(3), pp.137-153.
31. Mortensen, P.S. and Bloch, C.W., 2005. Oslo Manual-Guidelines for collecting and interpreting innovation data. *Organisation for Economic Cooperation and Development*, OECD.

32. Ning, Y., Fan, Z.P. and Feng, B., 2006. Knowledge capability: A definition and research model. *Knowledge Science, Engineering and Management*, pp.330-340.
33. Nonaka, Ikujiro and Nishiguchi, Toshihiro (Ed.), Knowledge Emergence. *Oxford University Press*, 2001, (part I,2), ISBN 0-19-513063-4.
34. Onarheim, B. and Friis-Olivarius, M., 2013. Applying the neuroscience of creativity to creativity training. *Frontiers in human neuroscience*, 7, p.656.
35. Organisation for Economic Co-operation and Development, 2005. *The measurement of scientific and technological activities: proposed guidelines for collecting and interpreting technological innovation data: Oslo manual. OECD*.
36. Osterwalder, A. and Pigneur, Y., 2010. Business model generation: a handbook for visionaries, game changers, and challengers. John Wiley & Sons.
37. Plattner, H., 2010. An introduction to design thinking process guide. *The Institute of Design at Stanford: Stanford*.
38. Petroni, A., 1998. The analysis of dynamic capabilities in a competence-oriented organization. *Technovation*, 18(3), pp.179-189.
39. Phaal, R., Farrukh, C. and Probert, D., 2001. Technology Roadmapping: linking technology resources to business objectives. *Centre for Technology Management*, University of Cambridge.
40. Quinn, J.B., Anderson, P. and Finkelstein, S., 1996. Leveraging intellect. *The Academy of Management Executive*, 10(3), pp.7-27.
41. Rajasekar, S., Philominathan, P. and Chinnathambi, V., 2006. Research methodology. *arXiv preprint physics/0601009*.
42. Revilla, E., Rodríguez-Prado, B. and Prieto, I., 2009. Information technology as knowledge management enabler in product development: Empirical evidence. *European journal of innovation management*, 12(3), pp.346-363.
43. Sharp, P., 2007. MaKE first steps—how a definition of knowledge can help your organisation. *The Electronic Journal of Knowledge Management*, 5(4), pp.487-496.
44. Stickdorn, M., Schneider, J., Andrews, K. and Lawrence, A., 2011. *This is service design thinking: Basics, tools, cases*. Hoboken, NJ: Wiley.
45. Tschimmel, K., 2004. A new discipline in design education: cognitive processes in design. In *DS 33: Proceedings of E&PDE 2004, the 7th International Conference on Engineering and Product Design Education, Delft, the Netherlands, 02.-03.09. 2004*.

46. Tschimmel, K., 2012, January. Design Thinking as an effective Toolkit for Innovation. In ISPIIM Conference Proceedings (p. 1). *The International Society for Professional Innovation Management (ISPIM)*.
47. Van Wulfen, G., 2012. Creating innovative products and services: The FORTH innovation method. Gower Publishing, Ltd..
48. Utterback, J.M. and Abernathy, W.J., 1975. A dynamic model of process and product innovation. *Omega*, 3(6), pp.639-656
49. Yin, R. K. (1984). Case study research: Design and methods. Newbury Park, CA: Sage.
50. Zack, M.H., 1999. Managing codified knowledge. *Sloan management review*, 40(4), p.45.
51. Zampetakis, L.A. and Moustakis, V., 2006. Linking creativity with entrepreneurial intentions: A structural approach. *The International Entrepreneurship and Management Journal*, 2(3), pp. 413-428.
52. Zheng, X.D., Hu, H.H. and Gu, H.R., 2009, October. Research on Core Business Process-Based Knowledge Process Model. In *Semantics, Knowledge and Grid, 2009. SKG 2009. Fifth International Conference on* (pp. 342-345). IEEE.

# Appendix | Appendix A: Literature review

	<b>Title &amp; Author Name</b>	<b>Abstract</b>	<b>Cited</b>
1	<i>Design Thinking as an effective Toolkit for Innovation.</i>  Tschimmel, K. (2012)	The author based her research on exploring Design Thinking (DT) from academical and practical respective. She refers to the general concept of DT, it's main characteristics and different models of DT process. Also paper gives an extensive classification of Design Thinking Tools for different creative activities.	15
2	<i>A new discipline in design education: cognitive processes in design.</i>  Tschimmel, K. (2004)	Author explore different cognitive processes involved in different in design activities. She also describes the approach towards Design Thinking from a perspective of Constructivist Theory. Also, she describes different cognitive mechanisms involved in a creative thing: the importance of perception, communication, teamwork and others.	11
3	<i>Linking creativity with entrepreneurial intentions: A structural approach.</i>  Zampetakis, L.A. and Moustakis, V. (2006)	In a paper, authors describe a link between entrepreneurial creativity and entrepreneurial intention. They emphasize the “intention model” where the attitudes allow to predict the intentions and, following this, intentions could predict the behavior. Authors conclude that creativity is a crucial part of the entrepreneurial intention.	93
4	<i>The design thinking approach to projects.</i>  Dijksterhuis, E. and Silvius, G. (2017)	The author of the paper aim to answer the question: what is the difference between the Design Thinking approach towards managing projects and the Rational Analytic approach? Paper also cover the main advantages of Design Thinking, how it could bring value to the project managements and impact the whole managing process.	X
5	<i>Creative research: the theory and practice of research for the creative industries.</i>  Collins, H. (2010)	Book describe a possible ways of conducting research in a creative context and what methodologies and guidelines could be used in order to make it. Authors also covers the academic research methodologies that could be adapter for creative industries.	164
6	<i>In praise of convergent thinking.</i>  Cropley, A. (2006)	Author describes the importance of divergent and convergent thinking in a creative process generation. Also in a paper mentioned the importance of luck and chance, intuition, effortful creativity and the connection between knowledge and creativity. He also highlighted how effectively convert existing knowledge into new ideas.	405

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| 7  | <p><i>Applying the neuroscience of creativity to creativity training.</i></p> <p>Onarheim, B. and Friis-Olivarius, M. (2013)</p>   | <p>The article describes how the neuroscience of creativity can be used in teaching “applied creativity” for creative thinking. Authors base their research on Applied NeuroCreativity (ANC) program, that had been taught at several business schools in Denmark and Canada. The results of the research prove that “inclusion of neuroscience principles in a creativity course can in 8 weeks increase divergent thinking skills with an individual relative average of 28.5%” (Onarheim and Friis-Olivarius, 2013)</p>   | 20 |
| 8  | <p><i>Science-to-Business collaborations: A science-to-business marketing perspective on scientific knowledge commercialization</i></p> <p>Boehm, D.N. and Hogan, T., (2013)</p> | <p>In a paper, authors discuss the importance of creating an interaction academic knowledge and different industries and markets. Authors also highlight the importance of collaborative work between both parties in order to benefit from knowledge commercialization. Also in the paper in details described the knowledge commercialization process in Ireland and Germany.</p>  | 37 |
| 9  | <p><i>Turning technical advantage into product advantage. The PDMA ToolBook, 2, pp.71-91.</i></p> <p>Markham, S.K. and Kingon, A.I. (2004)</p>                                   | <p>The authors discuss the technology-to-product-to-market (TPM) framework for transferring technological capabilities into products and then bringing it to markets for the users. It is described how to look and develop technical advantages and further explore its commercial application, how to turn technical specifications into technical capabilities and elaborate technology into product. Further authors describe the process of delivering products to carefully segmented markets. It is highlighted that “clear understanding of the products and markets should guide technical development”. (Markham and Kingon, 2004)</p> | 18 |
| 10 | <p><i>Information technology as knowledge management enabler in product development: Empirical evidence.</i></p> <p>Revilla, E., Rodríguez-Prado, B. and Prieto, I. (2009)</p>   | <p>The authors explore the influence of information technologies on knowledge exploitation and exploration in a process of product development. Also it is highlighted the importance of product development for an any organization in order to have a competitive advantage and bring right products to the right customers.</p>   | 31 |

<p>11 <i>Assessing knowledge assets: a review of the models used to measure intellectual capital.</i></p>	<p>The author summarize the data available about knowledge assets measurement through intellectual property models. He provides the detailed descriptions of currently developed models for knowledge estimation within the companies and describes the strength and weaknesses of each of the models. He highlights the importance of understanding the intangibility of the knowledge and importance of considering knowledge as a part of organization's assets.</p>	<p>1714</p>
<p>Bontis, N. (2001)</p>		
<p>12 <i>Technological autonomy and three definitions of technology.</i></p>	<p>In the essay author explore the term of technology from the perspective of contrasting technological discourse with scientific discourse. Author also describe a thought out approach towards the defining science and technology and comparing both terms. Also it it described the three dimensions of technology: technology as instrumentality; as novelty; and as as industrialization. As a result he came up with conclusion that technology is a very complex term as soon as "technology is a repository of overlapping, inconsistent meanings" (McOmber, 1999)</p>	<p>41</p>
<p>McOmber, J.B. (1999)</p>		
<p>13 <i>MaKE first steps—how a definition of knowledge can help your organisation.</i></p>	<p>Author formulate the importance for definition of what is knowledge for organizations context in order to succeed in knowledge management. Paper also explains the importance of this definition and author provide a "MaKE First Steps" framework that could provide organizations with insights regarding time, energy and resources investments.</p>	<p>6</p>
<p>Sharp, P. (2007)</p>		
<p>14 <i>Managing codified knowledge.</i></p>	<p>Author describe in a paper a framework for align together the company's organizational and technical resources as a leverage for knowledge exploitation and management. He provide an extensive overview of different types of knowledge within the organizations and perceive knowledge as one of the most important intellectual assets that require a thought-out approach for its effective management in order to bring organizations a significant competitive advantage.</p>	<p>2359</p>
<p>Zack, M.H., 1999.</p>		

15	<i>Knowledge transfer: A basis for competitive advantage in firms. Organizational behavior and human decision processes</i>	The authors argues that to create a durable basis for competitive advantage for a company it is important to create and transfer knowledge. Knowledge transfer and knowledge reservoir had been defined. Also the McGrath and Argote knowledge framework had been introduced as a methodological base: they consider that knowledge is are ingrained in the 3 basic elements of companies: members, tools, and tasks.	3920
16	<i>Managing knowledge transfer by knowledge technologies.</i>	The authors introduce the concept of knowledge management, describe its origins and contribution towards company's value. The importance of knowledge codification is covered and how ot could be done with a help of information technology. Also the authors describe how process of knowledge transfer could be achieved through deeper understanding of cognitive processes of transfer actors.	227
17	<i>Revisiting Technology and Knowledge: Their Contributions to Gross Value Added</i>	The author compare three different terms: technology, knowledge and capital and how these terms are intersected and interconnected. First, the paper cover the origins and concepts' epistemologies with further analyze the difference between them. As a result author come up with an algorithm that allow to quantify the value for the company that could be brought by knowledge, technology or capital and allow to estimate their contribution toward company's assets.	X
18	<i>Towards an innovation-type mapping tool. Management Decision, 49(1), pp.73-86.</i>	The paper aims to review and analyse different definitions, frameworks and classification related to types of innovations. Authors divide all pool of innovation typologies in two sections: foundation and integrative models and frameworks. Analysing and comparing different typologies authors propose an "innovation-type mapping tool" (Rowley, Baregheh & Sambrook, 2011) and describe the possible usage of the tool for academics and practitioners.	159

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| 19 | <i>Improving innovation strategic decision-making through the collaboration with design consultancies. DMI.</i>                             | The authors covered an importance of business collaboration with design consultancies companies in order to boost innovative decision-making. The case study approach had been used and results show design consultancies' capabilities of contributing the clients' business management.  | 4    |
|    | Calabretta, G., Gemser, G., Wijnberg, N. and Hekkert, P. (2012)   |  |      |
| 20 | <i>Enabling continuous and discontinuous innovation: Learning from the private sector. Public Money and Management, 25(1), pp. 35-42.</i>   | The article looks at innovation process and the possible ways it is organised and managed. Author describes sources of discontinuing triggers in the innovation environment and possible routines for managing this situations and effectively adapt to changing conditions.   | 130  |
|    | Bessant, J. (2005)  |  |      |
| 21 | <i>Targeting innovation and implications for capability development. Technovation, 25(3), pp. 171-183.</i>                                  | Authors developed and described a model for innovation organisation and management. They propose four main dimensions for innovation (4'Ps' approach): innovation in product, process, position and paradigm. Also in paper described the possible application of the proposed approach for strategic development. They highlighted the importance of strategic commitment during the implementation period. | 490  |
|    | Francis, D. and Bessant, J. (2005)  |  |      |
| 22 | <i>Ten types of innovation: The discipline of building breakthroughs.</i>   | The book dedicated to the introduction, description and implementation of ten types of innovation developed by L. Keeley and his colleagues. Authors provide an overview of each types and give managerial suggestions for each of the types. Also they provide readers with a set of tools that allows to identify most suitable type of innovation for each company.                                       | 119  |
|    | Keeley, L., Walters, H., Pikkell, R. and Quinn, B. (2013)   |  |      |
| 23 | <i>Oslo Manual-Guidelines for collecting and interpreting innovation data. Organisation for Economic Cooperation and Development, OECD.</i> | Oslo Manual had been prepared by Organisation for economic co-operation and development in order to develop policies that support innovation appropriately among 30 different countries. Document covers extensive range of topics including typology of innovations, linkages between innovation processes and ways of measuring innovation activities.   | 1361 |
|    | Mortensen, P.S. and Bloch, C.W. (2005)  |  |      |

## Appendix C: Questionnaire for interviews

### 1. General Questions:

- Tell a bit about your company? What is your position?
- What is your academical and professional background?
- Tell a bit about your responsibilities inside the company.

### 2. Innovation Process Related:

- Who has ideas for innovation and where these ideas are usually come from?
- How the evaluation of ideas happen?
- Do you have any organisational structure for innovation within the company?
- How's company usually dealing with problems? Or with innovation process?
- What are the most challenging during the innovation process?
- Do you have systematic approach towards innovation?

### 3. Design Thinking Related

- Have you ever heard about Design Thinking Methodology?

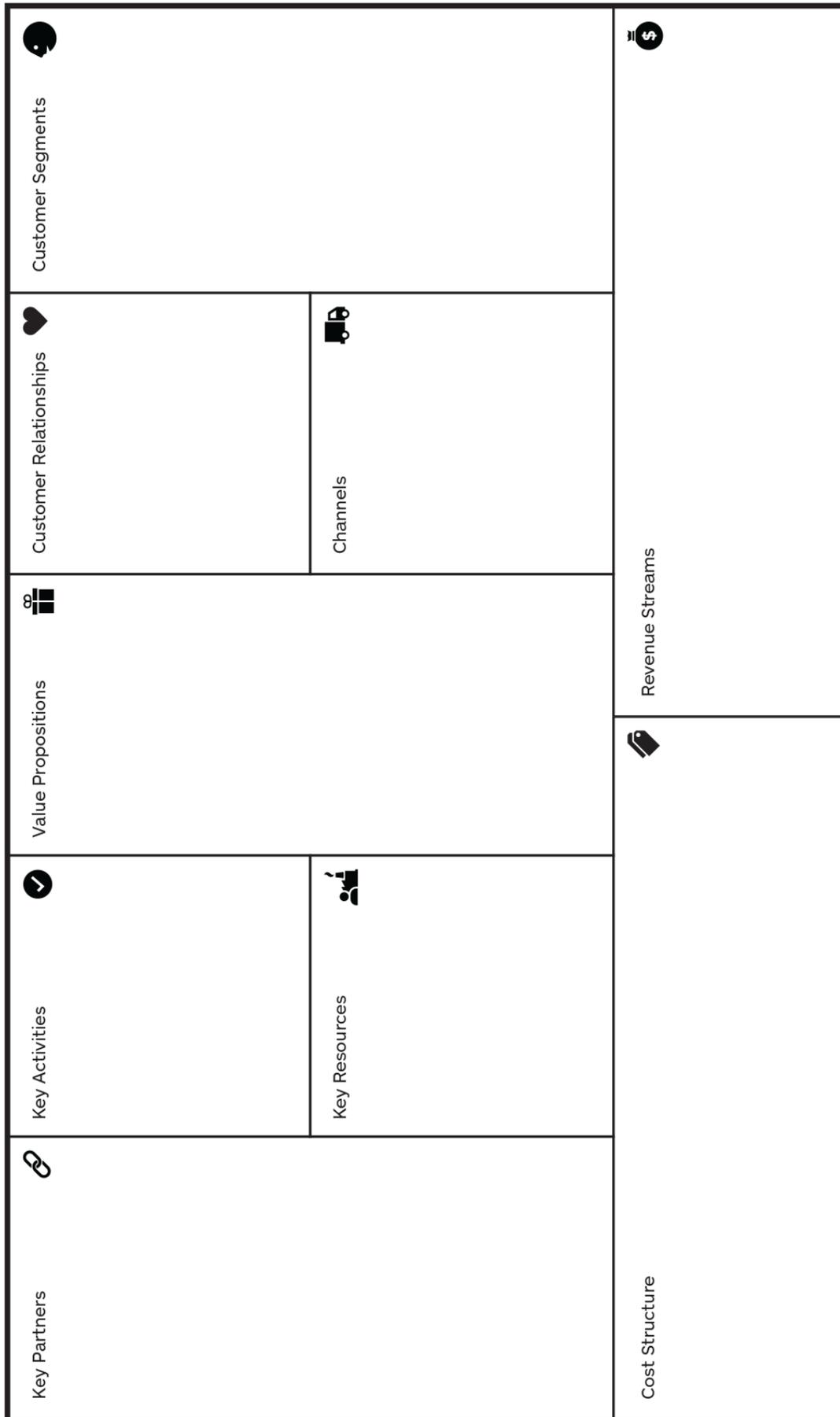
In case of "YES" answer:

- What do you know about it? How do you imagine it?
- Do you usually practice is in your For what purposes do you use it in your company?
- Do you use external resources or you practice it with internal resources?
- Who responsible for DT process facilitation in your company?

In case of "NO" answer:

- How would you imagine DT process?
- For which goals you are assume it could be useful for your company?
- Would you be interested to experience it?

## Appendix B: Business Model Canvas



## Appendix C: Interview transcriptions

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**Interview with NELSON PEREIRA, Co-founder & CEO at [www.topdox.co](http://www.topdox.co)**

Interviewer (I); Nelson (N)



*I - Tell a bit about your company? What is your position? What is your academical and professional background?*

N - I was writing a PhD in Data Layer and this is where everything started.

*I - What makes Topdox different from other cloud-based services?*

N - Actually we are not a cloud service. What we are is platform with people from different cloud services to collaborate with each other. So Our vision is to remove barriers for collaboration between different services.

*I - You consider your service as innovative?*

N - Yes.

*I - What makes it innovative?*

N - All other companies related to cloud storages, clouds and document collaboration start with an idea that everybody in the world should be on their service. We start from the point, and our vision is — that it doesn't matter what technology platform do you use, what type of documents do you use, you should be able to collaborate. So this is the key difference between our approach and approach of the other companies. Because for us it is like in the old times: do you remember when you want to collaborate with someone on a file or a document, you just grabbed a piece of paper and start writing together. And you weren't checking if you are using the right pen or if my paper was comfortable with your paper so inter-operability was not an issue. So nowadays with a technology you have way more options and technology empowers the way we work together. but at the same time create a lot of barriers and add complexity to the work loads. So our mission was to remove those complexities and make it as easy as grabbing a piece of paper and collaborate in a digital world.

*I - Okay, so during the whole process — from developing an idea till launching the product, what was the most challenging for you?*

N- We faces a lot of challenges. Its a hard question. The first big challenge was to get mentors to help us with building a business: how Internet work as a business, how to monetise product and os on, how to build a business model. This was the first challenge. the second challenge was to build a team and to scale it. the third challenge was to get funding — upraising money was always a challenge.

And the last big challenge was technology - how to address different technology stacks and make them work together. So these were the main challenges that we faced.

*I - Usually you are dealing with all of these challenges with inner resources or you sometimes have to invite someone from the outside to help you to deal with it?*

N - When we started, we did outsourcing, but now its all internally. We prefer to work with internal team on a daily basis, because that is where innovation happens: through conversations and discussions and pushing forward. When you have an outsources team, the innovation process is harder. Because you need to think about everything on your own and then just send the spec's sheet and they ( - the team) will get things done. There is no really live interaction about the product, about the technology and about how things can evolve.

*I - So at this point, for your business the most important is to innovate within the product and service that you are providing?*

N - Yes, actually if we look back to first app that we released, the first idea evolve a lot. The vision is still the same, but technology changed and the app changed. We are now focusing more on a desktop, that mobile. We are focusing on integrating a collaborative platform, like Jira, so there are lots of things changed and evolve, but I think its normal for pretty much every startup. The original idea needs to evolve, and if you are not evolving - then something is wrong.

*I - And this evolution usually comes from developers, or from other team members, or from you? How is it usually happening?*

N - Its happen pretty much from everywhere. First - customer and market feedback. Also partners feedback is very important. And them internally is important to find the right answer to these feedback - that comes from developers, from me, from my co-founder Miguel, we have discussions. We talk about user feedback and how we could transform this feedback into a product feature.

*I - Okay, my last few questions is related to the internship that I'm doing in a design consultancy company Mindshake and they are specialising on Design Thinking. And I wanted to ask, have you ever heard about Design Thinking approach?*

N -Yes, actually I'm a designer myself - so yes, I know about Design Thinking.

*I - Great, and do you practice it inside the company?*

N - Well, Design Thinking is kind of a basic approach for problem-solving companies. So we start from the user stories and user problems. and we start with those problems and was trying to understand, how we could fix them for the users. We also involve everybody in a team during brainstorming.

**Interview with VALTER HENRIQUES, Co-founder & CEO** [www.shortcut.pt](http://www.shortcut.pt)

Interviewer (I); Valter (V)



*I - Tell a bit about your company? What is your position? What is your academical and professional background?*

V - Shortcut is a specialised Software development and implementation company, particularly in human resources and Telco's areas.

V - We listen to our clients and try to figure out the solution that best fits their needs. At this time we have some products, regarding the human capital management, that we are trying to sell. We are able to

*I - And this evolution usually comes from developers, or from other team members, or from you? How is it usually happening?*

V - Typically it comes from the challenges of our clients. Afterwards we do some brainstorming with our team to figure out what are the best solutions.

*I - Okay, which are the most challenging tasks for Shortcut during this innovation process?*

V - It depends a lot on the project. For example, we have a typical IT project with EFASEC, using links and data technologies. and it was a it difficult because all ways you have to plan the solution, were totally different from the standard ways. So we have to study and manage with our client, and to understand together with a client how to solve the issues in another paradigm.

*I - What challenges do you usually face inside the company? For example, more challenges come from product or processes, or from service that you are providing or maybe you are dealing with organisational challenges?*

V - It depends a lot on a team members that we have. There are team members that are more not so open to change their habits, and we are also have team members who are always trying to come up with a new solutions. And this is a problem: we have someone, who are always gathering new trends and it is important to capitalise the effort, that is standing behind that.

*I - And usually who is facilitating this innovation processes and issues? You or any other team members?*

V - It depends. Sometimes team members suggest some alternatives, and my job is to decide, is it is a right time to try new technology for example, or it is better to keep up with what we have. The rest of the team could be more stuck to the technology, that they are used to work with. On our human resource department side, there are more activities for people to be more pro-active, not to be afraid

of telling their opinions and other things like that — in other words. create an environment so everyone could say whatever they feel like saying.

*I - Okay, my last few questions is related to the internship that I'm doing in a design consultancy company Mindshake and they are specialising on Design Thinking. And I wanted to ask, have you ever heard about Design Thinking approach?*

V - I have read different text, with different mentions of Design Thinking. But I don't know about if in more details.

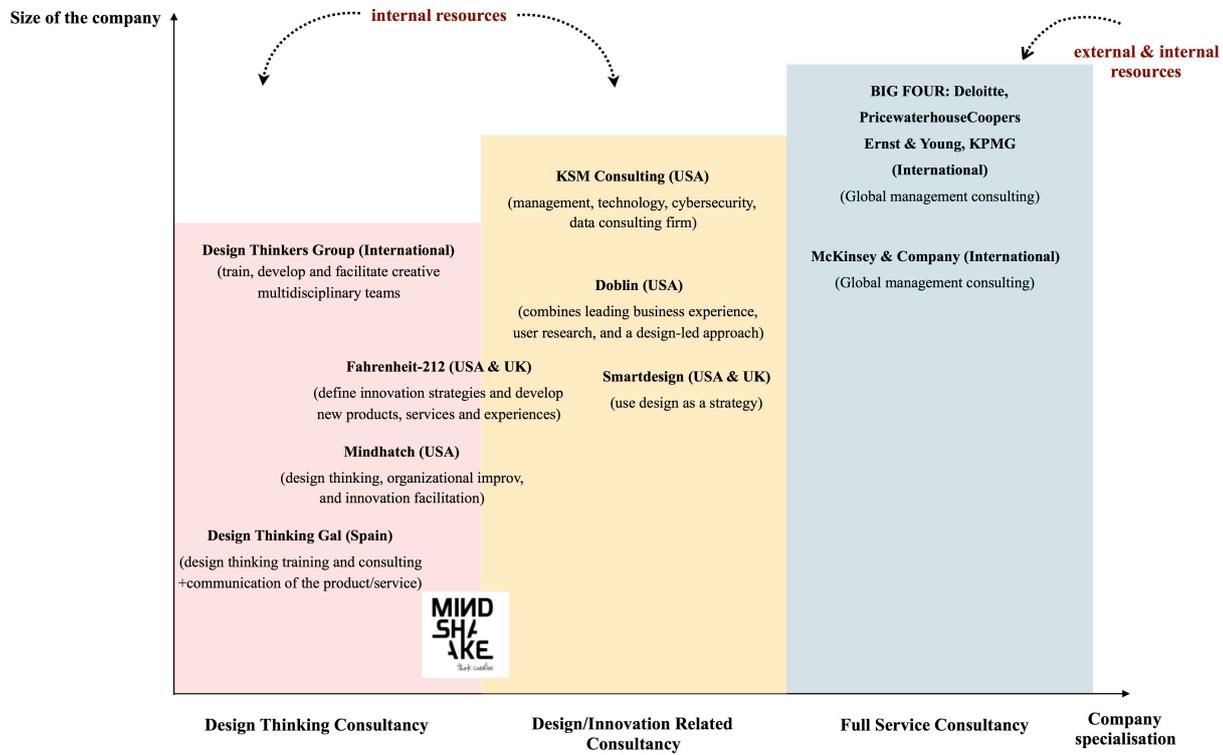
*I - From what you've read and from your experience, what do you think it is? You could just tell what you are imagine about it?*

V - Design Thinking approach, in my view, it would be to try to make a solution, that end users would be using to solve their problem and try to build a solution depending on this users needs.

*I - Great, you give quite precise definition of design Thinking. Would you be interested to experience the Design Thinking process for your team and to use it for the company's inner processes and team?*

V - Yes, I think it would be interesting to try.

# MINDSHAKE's Competitors Analysis



**Lean Startup vs. Design Thinking Comparison based on the analysis of Mueller & Thoring, 2012, adapted by Mindshake, 2017**

	Lean Startup	Design Thinking
	<b>Similarities</b>	
<b>Innovation Focus</b>	Same goal — foster innovation.	
<b>User-centered Approach</b>	Take the perspective of users and other stakeholders and focus on extensive user testing.	
<b>Test Prototypes</b>	Gather user feedback in early stages of the process.	
<b>Rapid Iteration</b>	The solution and the problem are quite unclear in the beginning. Developed prototypes undergo extensive iteration within the process.	
	<b>Differences</b>	
<b>Scope</b>	Mainly targeting startups.	Seeking for innovation in general.
<b>Project Initiation</b>	Starting from the initial business idea.	The project starts with the identification of an opportunity or a challenge.
<b>User Research</b>	The project starts with a product vision of the founders.	Extensive user research in the beginning of the project in the empathy phase.
<b>Syntesis</b>	—	Methods for synthesising insights from user research, which helps to align the researched information in a qualitative way.
<b>Customers, Users &amp; Stakeholders</b>	<ul style="list-style-type: none"> <li>— Find out who might be the early adopters or lead users and what kind of problems they might have that could be solved by the suggested product.</li> <li>— Different types of customers and markets.</li> </ul>	<ul style="list-style-type: none"> <li>— The process starts with extensive ethnographic user research before any ideas are generated.</li> <li>— Only refers to “end users” (sometimes stakeholders) and does not use any market typology.</li> </ul>
<b>Ideation</b>	—	Extensive use of classical ideation techniques.
<b>Pivoting/Iteration</b>	Pivoting happens above all in the Experimentation (build step) or Customer Validation phase.	The whole design thinking process is iterative.
<b>Quantitative Evaluation</b>	Using metric-based evaluation techniques; “innovation accounting” to measure the progress in validated learning.	Split-test experiments (A/B testing) for the measurement of the effectiveness of design solution; cohort-based analysis for understanding longitudinal effect of design decision; no metric-based evaluation techniques
<b>Business Model</b>	Business Model Canvas (Lean Canvas).	Only some design thinking models will include the Business model.
<b>Qualitative Evaluation</b>	No focus on qualitative data.	Testing and user feedback gathered through qualitative interviews and ethnographic methods.
	<b>Potential to improve Lean startup</b>	<b>Potential to improve Design Thinking</b>
	<ul style="list-style-type: none"> <li>— Qualitative research methods: to improve definition of targeted customers;</li> <li>— Structured frameworks or the generation of qualitative persona;</li> <li>— Ideation techniques: for concept variations;</li> <li>— Qualitative feedback evaluation;</li> <li>— Pivoting should be applied earlier.</li> </ul>	<ul style="list-style-type: none"> <li>— Early pivoting: implement feedback testing and iteration loops earlier in the process, even before there is prototype;</li> <li>— Metric-based evaluation techniques: for quantitative measuring of user feedback;</li> <li>— Business model in addition to prototypes and concepts;</li> <li>— Roadmaps in the implementation phase.</li> </ul>

# Design Thinking Model Evolution 6

with the identification of lean startup techniques

