Evolution of Design Thinking Capabilities

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Design and especially design thinking are becoming a strategic source of competitive advantage. From its business theorization in early 2000s the adoption and awareness in both academics and practitioners’ world is unmeasurable. Today’s the attention of academics is no more only on the process and its phases, inspiration, ideation and implementation but more and more attentions are positioned on the team dynamics and the more hidden aspects of such methodology. As a matter of fact, literature shows that design thinking is not unique but it can be framed in at least four different kinds creative problem solving, sprint execution, creative confidence and innovation of meaning. The investigation aims at discovering which are the different capabilities characterizing the different kinds of design thinking. Through a survey on the Italian market of service providers of design thinking services the paper shows the different skills, competences and attitudes that are more relevant for each of the four kinds of design thinking. This is valuable for both practitioner and academics because it enriches the knowledge on the team composition in terms of capabilities, a still blurred element of the design thinking literature.

Keywords: Design Thinking, Design Capabilities, Design Attitudes, Design Skills

Introduction

Design is increasingly becoming a strategic source of competitive advantage, to the point that scholars and practitioners investigate the managerial practices that firms employ to seize opportunities resulting from the adoption of design principles in companies (Capaldo, 2007; Dell’Era and Verganti, 2010; Verganti, 2017). The emergence of new paradigms such as human-centered design (Buchanan, 2001), participatory design (Sanders and Stappers, 2008) and especially design thinking (Brown, 2008; Martin, 2009), highlight the transforming role that design can play in the field of innovation. The growing number of publications in academic journals (Brown and Wyatt, 2010; Kolko, 2015) and the emergence of new approaches such as Circular Design or Design Sprint (Knapp et al., 2016) shows how the debate around this topic is still evolving and sometimes controversial. On the practitioner side the recent acquisition of Lunar by McKinsey or Fjord by Accenture represent just two examples of a broader phenomenon.

The attention toward the booming of Design Thinking is not only of interest for practitioners but also for scholars. As a matter of fact, since its framing back in 1991 by Rowe it evolved and changed a lot. Researchers pointed out many different processes to perform and realize a Design Thinking process but still an ongoing debate is present in both practitioners and academics word about the ideal structure and framing of such a process (Liedtka, 2015). Both in the literature and in the practitioner field huge resonance is given to the IDEO view on it, to the point that the several researchers recognize in Tim Brown the father of the Design Thinking first embodiment (Brown, 2009). In particular, at that time design thinking has been defined as a formal
method for practical, creative resolution of problems and creation of solutions (Brown, 2009). This definition clearly shows the fact that this paradigm allows to address wicked problems (Camillus, 2008) by adopting a creative problem solving approach. This is not the only aim for adopting a design thinking approach. As a matter of fact, it is evident nowadays in the practitioners’ world how this approach is relevant for several different aims. When the goal is to learn in a fast way if the idea is valuable or not several approaches are relevant such as the Lean Startup approach (Ries, 2011), the Agile Stage Gate (Cooper and Sommer, 2016) or the Design Sprint (Knaap et al., 2016). These are united by the fact that they all look at a fast, sprint execution of the process in order to speed the time to market of the ideas. This in order to reduce the uncertainty and be sure that the idea is valuable. As it is event the sprint execution that join the above paradigms is strongly linked to the design thinking by the fact that nowadays the process is a subsequence of divergent and convergent phases as well as the activities are somehow similar. Moreover, lately Design Thinking has been adopted by companies in order to foster innovation and better aligned the vision of companies. In this strategic usage of Design case such as PepsiCo or 3M are pioneers with the formalization of the figure of Chief Design Officer. This figure is the promoter of the design thinking paradigm not only for solving wicked problems or in sprint executing an idea but to create the confidence inside people that will join the projects. This further evolution of the design thinking is laded by researchers Creative Confidence (Kelley, D. and Kelley, T., 2013). Finally, what is emerging is that another aim for embracing design thinking as a paradigm for innovation is the identification of a new direction (Verganti, 2017). In this later approach the mindset and the practices of design thinking are steered toward a higher goal that is the envisioning of the new strategy for the organization. This envisioning process can leverage the strategy (Verganti, 2008) or the technology (Dell’Era et al., 2017).

What is clear in today’s market is the plethora of these paradigms of design thinking that differ not only for the aims and the underpinning principles but also for the skills, competences and attitudes that are required for adopting them.

So, the main aim of the paper is to address this topic by exploring the different capabilities that are needed in order to offer different design thinking services. As a matter of fact, this avenue of research is interesting for both practitioners and scholars do to the fact that shift the attention from the process to the people and so enriches the knowledge of both in terms of skills, competences and attitudes that connote the different paradigms.

In order to address such a complex topic, we design a survey in order to gather such information and we decided to focus on the Italian market due to is crucial role in the design environment thanks to the mediatic attention toward several global initiatives such as the Milan Design Week and the Compasso d’Oro award. The evidences gathered refer to the different skills, competences and attitudes that are relevant in order to deliver different design thinking services. So, after pointing out the four main paradigms, creative problem solving, sprint execution, creative confidence and innovation of meaning the investigations highlighted which set of capabilities were relevant across the different approach. As a result, the paper summarizes in a comparative perspective the most relevant skill, competence and attitude for each of the four approaches. This enriches the knowledge around the design thinking evolution for both practitioners and scholars due to its focus on the people characteristic more than on the process one.

The Paper is structured as follow. After a brief overview of the four paradigms of design thinking a literature review regarding the main skills, competences and attitudes will be reported. Then a dedicated section details the methodology adopted for both the data gathering and the data collection. Thus, the empirical results will be reported before the comparative discussion. Finally, the conclusion with the main contributions and the future avenues of research will be specified.

**Theoretical Background**

Given the aim of the paper the theoretical background has a twofold objective. First it aims at showing how design thinking has evolved over years from an academic perspective and how four main paradigms can be identified inside the emerging literature. The second is the identification of the relevant set of skills, competences and attitudes that are relevant for better exploring the four paradigms identified.

The origin of design thinking goes back to Rowe, that in his studies in 1987 defined this label. From then on, several researches have been published and the academic attention has grown exponentially to the point that today’s in the academic world can be identified different paradigm of the same approach. In particular in this
study we will refer to four kinds of design thinking called creative problem solving, sprint execution, creative confidence and innovation of meanings. These four paradigms are defined in the academic world as approaches toward innovation that leverages on different principles and practices but that are united by the fact that they leverage on a “designerly” way of thinking at innovation (Cross, 2001).

In particular the first kind defined as creative problem solving takes its origin from the idea of facing wicked problems (Buchanan, 1992; Coyne, 2005) with creativity and naive mind. In particular this approach was framed by Tim Brown that in 2009 framed this approach by pointing out the main underpinning elements. These are: the central role of the human, the iteration and the extensive usage of methods to foster creativity in the ideation phase. Thereafter further researches on design thinking as creative problem solving were performed in order to point out different aspects by adopting different perspectives the processes (Çetinkaya et al, 2013; Johansson-Sköldberg et al., 2013) or the people (Liedtka, 2015).

The second is the one that takes roots from the agile way of manage innovation (Cooper and Sommers, 2016). It is defined as sprint execution and leveraging on the idea that as far as the process is managed internally by the Research and Development team the uncertainty is relay high force the company in looking outside the boundaries by interacting in a fast and sprint way with the market (Knapp et al. 2016). As it is evident by deepening the approach sprint execution is the umbrella under which all the methodologies that focused a lot on Minimum Viable Products and iteration are inserted. This is the reason why this is the second approach of design thinking chronologically speaking. As a matter of fact, even if the lean startup approach (Ries, 2011) is aimed at supporting startups in developing solutions there are profound similarities in the two approaches that allow to generalize this kind of design thinking as sprint execution do to the focus on the fast experimentation and test of ideas in the market (Zeratsky, 2016).

Design Thinking can aim not only at solve wicked problems or execute in a fast way solution it could also support people in feeling more confident in proposing innovation. This usage of design thinking is the one that goes under the umbrella of creative confidence (Kelley, D. and Kelley, T., 2013) and it aims at fostering the individual creativity of the components of the team. So, the design thinking paradigm in this case it is not used to propose new ideas or test them in a fast way but in this case the idea is to use this methodology to incentivise people to be more confident in proposing ideas (Kelly, T and Kelly, D., 2012).

Finally, what comes out from the analysis of both the literature and the market is that the design thinking paradigm can be used also for identifying the new direction for companies (Verganti, 2017). In this case the principles and the aim of the approach is completely different from the previous one even if the “designerly” approach is still present. In particular this last paradigm of design thinking is the one that allow companies to identify new more meaningful direction for their business and so steer their strategy toward a more valuable vision (Verganti, 2009; Dell’Era and Magistretti, 2018).

What emerges from the brief overview previously reported is that in the literature and in the market, there are four kinds of design thinking that despite different aims they all leverages on the central role of the human, the idea of challenge the ideas and to have a defined process to reach the final solution. In particular the four paradigms refer to four different questions. Indeed, the creative problem solving aims at answer to the what question, sprint execution at the how, creative confidence at who and the innovation of meaning at why. These because the first is more oriented on the generation of wild ideas the second to the understanding of the functions of the idea challenged, the third is oriented at empowering the people and the last one at identifying the reason why people should love the new solution.

After having identified and defined the four kinds of design thinking that were the entry point of our investigation we now focus our attention on the capabilities that each of it will require. In order to do that we will review the literature related to three categories of capabilities labeled as skills, competences and attitudes. The reason of this classification is related to the fact that the first are more related to the background of the person and so are more tangible elements while the latter are more close to the soft skills and are inherent to people.

In particular when talking about design thinking the most important set of skills are user analysis, cultural insights, visualization, prototyping, testing and business modeling. These are the one that are recognized as relevant by scholars and practitioners. In more detail, the first, user analysis, is the capacity to gather and cluster insights obtained from users or clients (Veryzer et al., 2005). The second, cultural insights, is the capacity to spot and sense emerging cultural trends (Kolko, 2010). The third, visualization, is the capacity of communicating ideas and thoughts through sketches, images and drawings (Goldschmidt, 1994). The fourth,
prototyping, is defined as the capacity to transform ideas, even not fully developed ones, in tangible and working artefacts (Seidel and Fixson, 2013). The fifth, testing is the skills that allows one to organize the learning extracted from market tests (Ward et al., 2009). The last one, business modeling is the capacity to identify customers, partners and suppliers so that value creation and appropriation are both maximized (Chesbrough, 2010).

The second sets of capabilities considered are the competences. As a matter of fact, in order to properly manage the different kinds of design thinking in the literature it is reported how the competences of the people involved are fundamental in order to reach a valuable result (Danneels, 2002). In particular in this case the set of capabilities considered are framing/reframing, collective leadership, creativity, criticism, brokering and storytelling. The first one refers to the competence in iteratively define and redefine the problem in order to deeply understand the faced challenge and identify new solutions (Schön, 1984). The second is collective leadership defined as the competence in mobilizing human, cultural, and technological resources in order to pursue a shared vision (Denis, et al., 2001). The third competence regards creativity and it is the capability to thinking outside of the box and proposing original ideas (Dorst and Cross, 2001). The literature than shows how criticism is also a crucial competence in design thinking as far as asking questions and providing effective feedback in order to dig deeper in the reasoning is relevant to address different problems (Verganti, 2016). In addition to these considering that design thinking is primarily a designer methodology the competence of brokering: defined as the capability to bridging solutions adopted in different settings and in gaining inspiration from different fields is relevant (Hargadon, and Sutton, 1997). Finally, the competence of sharing ideas through storytelling is considered by scholars as a relevant competence to be considered in creating the team for delivering design thinking services (Liedtka, 2015).

In addition to the two previous set of capabilities by reviewing the literature and interacting with real companies become evident how the attitudes are also relevant in delivering design thinking projects (Rowe, 1991). So the attitudes that emerged as relevant are optimistic mindset, tolerating failure, embracing ambiguity, troublemaking, pragmatism, empathy. By optimistic mindset scholars refers to the attitude to think optimistically toward innovation results (Carlsgren, et al., 2016). The second attitude considered is tolerating failure which stands for the acceptance of failures and willingness to learn from them (Holloway, 2009). In addition to those also embracing ambiguity as the attitude to accept to work on solutions that are not completely defined up to the end of the process is considered relevant by academics in design thinking projects (Sgourev, 2013). Moreover, troublemaking is an attitude that is believed as relevant as the embracing of ambiguity. As a matter of fact, the attitude to challenge continuously the solutions proposed by others is crucial to deepen in the reasoning (Knapp, et al., 2016). The fifth relevant attitude is pragmatism defined as the capability to concretely face problems through the quick identification of feasible, even if simplified, solutions (Romme, 2003). Finally, the empathy (Gruber et al., 2015) so the attitude to look at problems from the standpoint of other people (usually the end user) is the last but most important attitudes of all the four kinds of design thinking due to its centrality in the paradigm of human centered design.

The above overview of skills, competences and attitudes shows the fact that in the literature the capabilities that are recognized as relevant in order to offer design thinking services are present. What is missing is the link between these sets of capabilities and the different four kinds of design thinking previously highlighted. So, the aim of the paper is to enrich the knowledge of both practitioner and academics on which are the different capabilities characterizing the different kinds of design thinking?

**Research Methodology**

In order to answer to the previous mentioned research question, the paper adopted a survey methodology (Forza, 2002). This seemed, to be the best way to manage the investigation due to the fact that the skills, competences and attitudes emerged from the literature on design thinking and also the 4 kinds of design thinking are present in the academic literature. In particular the survey was framed by the authors leveraging the insights coming from the literature and 47 in depth cases studies analysed in the Italian market. Even if the cases were aimed at a different scope and the evidences are going to be insert in a different paper it is worth to mention that the fruitful discussion between the authors and the companies that offer design thinking services in the Italian market facilitated us in defining the structure of the survey. In particular the first draft of the survey was defined by the authors and then submitted to an international panel of academic experts in order to validate the construct. As a matter of fact, the initial numerosity of the sets was bigger than the 6 constructs that at the end were inserted in the survey. So, after the trial and the validation the survey the final
The structure was as follows. The first part was more related to gathering information about the respondents than the focus was shifted to the different sets of capabilities that the service providers of design thinking believe are relevant to properly offer the different kinds of design thinking. In particular, the structure adopted to perform this second half of the investigation is the most articulated one. As a matter of fact, in order to answer to the above-mentioned research question, we asked informants to allocate 100 points over a set of 6 skills, 6 capabilities, and 6 attitudes when the four different kinds of design thinking were faced. In order to be more robust in the data gathering we decided, accordingly to the suggestion received during the trial, to ask indirectly this aspect. So, we submitted to the managers 4 different briefs that were differently for the actions required and we asked to the informants to point out first the most important skill for that brief than the competences and finally the attitudes. So, at the end each informant allocated 100 points for 4 briefs three times (skills, competences, and attitudes). The next section details both the data collection and the data analysis.

Data collection and data analysis

Due to the aim of the investigation and the focus on understanding the relevance of the different design thinking capabilities, the survey was performed on the Italian market. In particular, only service providers of design thinking services were addressed. This is justified by the fact that the aim of the investigation is to understand the skills, competences, and attitudes that are relevant in the four different kinds of design thinking previously reported, creative problem solving, sprint execution, creative confidence, and innovation of meanings. Accordingly, the survey was submitted February 2018 to more than 500 managers of strategic consultants, design studios, technology developers, and digital agencies operating in the Italian market. After a first round of 80 replies were gathered and so two rounds of reminder in the period March and April were performed. This brought 100 more replies that after the cleaning of the database from incomplete or incorrect replies caused a reduction to the final number of 130 useful data points that means that 26% percent of the population addressed was reached.

After the collection of the data, the process of data analysis started and in particular, we divided the analysis into two subsequent phases. First, we considered the three sets of capabilities respectively skills, competences, and attitudes individually. Second, we compared and contrasted the different capabilities among the four kinds of design thinking in order to better compare the capabilities more relevant for each approach. In order to do that, the average points allocated by each respondent to the particular brief was considered. So, the mean was used to enrich the knowledge of both practitioners and researchers on the most relevant capabilities to offer different design thinking capabilities.

The next sections will report this evidence first by detailing skills by skills than by comparing and contrasting them.

Empirical Results

The empirical results report the evidences coming from the analysis of the 130 answers gathered from the survey. In particular, we will follow the structure of the survey itself in reporting the results. So, starting from the skills, we will advance with the competences and finally, we report the attitudes. In particular, in each section, we report the insights for each kind of design thinking pointing out the most relevant one.

Skills

Starting from the skills, the set considered in the analysis are the one reported above in the literature and in particular are user analysis, cultural insights, visualization, prototyping, testing, and business modeling. These were selected among the large number available because they are crucial and relevant when design thinking is offered. Figure 1 reports the average number of points allocated by the respondents on the four kinds of design thinking in particular. In red is reported the allocation on the creative problem solving, in blue the sprint execution in yellow the creative confidence allocation, and finally in green the innovation of meanings.

What emerges from the analysis is that in the creative problems solving managers that offers design thinking services believe that user analysis is fundamental to manage such approach. This is coherent with the theory reported above that stress the fact that this kind of paradigm focuses entirely on the central role of human and his needs. For what concern the sprint execution on the contrary, the most important skill is the prototyping. Managers averagely allocated 23 points on this stressing how this skill is fundamental to fast comprehend if the idea is valuable in the market. Also, in this case, the answers gathered are aligned with the
theory previously exposed. Managers offering design thinking services suggest that when the aim is to support innovators in creating ideas the skill of cultural insights is crucial. This is relevant because people in this approach should be motivated in looking at external trends and gather them in order to better understand the motivation of the people. Finally, when the focus is in offering design thinking services with an innovation of meaning approach the business modelling is the most important skill. This because the reason why people should love the new direction and consequently the solutions proposed should be deeply explored in terms of pain, gains and value proposition.

Figure 1: Skills relevant in each of the four kinds of design thinking

Competences

When the attention is moved from skills to competences and so to capabilities that are more personal and less related to personal background the set explored are framing/reframing, collective leadership, creativity, criticism, brokering and storytelling.

In particular, in the creative problem solving approach the informants pointed out as the most important competence the creativity. This is aligned with the idea that in this kind of design thinking the number of idea generated is quintessential. In the sprint execution the capabilities of framing and reframing and brokering existing solution in the ideation phase is something crucial for sprint execution this because otherwise there is not time to properly develop the prototype and testing it. In addition to that Figure 2 highlighted how collective leadership is the crucial competence for creative confidence and how this competence is the most important for service providers that want to offer this kind of design thinking services. As a matter of fact, creative confidence aims at facilitate the creation of innovation by working on the people so the competence of inspiring a collective leadership is crucial. Finally, in innovation of meanings the managers reached by the survey shows how the creativity is important also in this paradigm of design thinking. This is aligned with the idea that this approach is inside out and so without creativity is difficult to generate a new direction that people would love.
Attitudes

The last section of the empirical results reports the attitudes that were indicated on average as relevant by the service providers that replied to the survey. In particular the item considered in this analysis were the optimistic mindset, tolerating failure, embracing ambiguity, troublemaking, pragmatism, empathy.

In particular for what concern the creative problem solving approach the respondents pointed out as the most important attitudes the optimistic mindset and the empathy. These two are due to the fact that this approach more than anyone else requires a deep ability in entering into empathy with the final users and moreover requires an optimistic mindset in order to design the set of possible solutions to the wicked problem identified. Figure 3 then reports how in sprint execution the most important one is pragmatism and this attitude is linked to this kind of approach by the fact that consultants involved in such approach must be oriented on delivering tangible solutions and practically test the hypothesis. Finally, in innovation of meanings the respondents to the survey spotlight as the most important attitude the optimistic mindset. This is in line with the idea that people could not love a product that you do not love which is one of the pillars of such kind of design thinking.
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and test skills are crucial nowadays. When it comes to creative confidence is evident how the user analysis and creation and testing of hypothesis the success of such approach is a hard to follow. This evidence enriches the how this skill are crucial for a sprint execution. If the team is not trained stressing the role of the prototyping and test skills. As a matter of fact, the evidences reported in figure 4 shows diverging. This is aligned with the idea of the double diamond of the Design Council that implicitly says that the traditional creative problem solving is equally distributed on convergence and divergent phases (Brown, 2008), on the other side shed lights on the support the convergent phase (prototyping, testing and visualization) the sum is almost 80 points and are 40 for diverging and 40 for converging. This is extremely interesting because on one side support the idea of T and Kelly, D., 2012). Finally, the innovation of meaning is the optimistically Tolerating Failure Empowering Troublemaking Pragmatism Empathy

After having reported briefly the results gathered from the analysis of the 130 responses next section will better compare and contrast the different responses and points out the main contribution both on practices and theories.

Discussion

The following section aims at comparing and contrasting the different skills, competences and attitudes among the different paradigms. This will enrich the knowledge of both academics and practitioners on the relevant capabilities in offering design thinking services.

Starting from the skills the comparative analysis in the creative problem solving is interesting how the skills supporting the divergent phase (user analysis and cultural insights) are almost equal in relevance to the one supporting the convergent phase (prototyping, testing and visualization) the sum is almost 80 points and are 40 for diverging and 40 for converging. This is extremely interesting because on one side support the idea of the double diamond of the Design Council that implicitly says that the traditional creative problem solving is equally distributed on convergence and divergent phases (Brown, 2008), on the other side shed lights on the skills that companies should cultivate in order to effectively promote such paradigms. On the contrary in sprint execution the most relevant are the one related to the converging phase 53 points compared to the 28 of diverging. This is aligned with the idea of the agile approaches (Ries, 2011; Cooper Sommers, 2016) but it stresses the role of the prototyping and test skills. As a matter of fact, the evidences reported in figure 4 shows how this skill are crucial for a sprint execution. If the team is not trained and does not manage properly the creation and testing of hypothesis the success of such approach is a hard to follow. This evidence enriches the literature on experimentation (Thomke, 2003) by stressing is relevance also in the design and innovation field.

As a matter of fact, 130 managers of companies offering design thinking services believe that the prototyping and test skills are crucial nowadays. When it comes to creative confidence is evident how the user analysis and cultural insights are more relevant than the remaining ones that are more oriented toward the solution. This insight corroborates the growing attention of design thinking in leadership and organizational behaviour (Martin, 2010; Liedtka, 2015). Indeed, not only researchers are trying to better comprehend how this kind of approach can create a better engagement of people in innovation but also practitioners are really interested in it. What is really interesting is the centrality of the cultural insights. This shows how managers perceive the skill of grasping trends and understanding where people want to go in order to facilitate the creative confidence, this is important because enriches the consideration of the Kelly brothers of just considering the primary role of tools and motivation (Kelly, T and Kelly, D., 2012). Finally, the innovation of meaning is the paradigm that shows, despite for the testing which is undoubtedly irrelevant, a more balanced relevance for

Figure 3: Attitudes relevant in each of the four kinds of design thinking

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the skills. This insight is for sure relevant because it enlarged the evidence of such a kind of design thinking shifting the focus from the process (Verganti, 2016; Verganti, 2017) to the people participating in it.

Figure 4: Comparative analysis of the key skills

Advancing the analysis from skills to competences and so from the background of the people to a less sizable capability the competences and the contributions of the investigation evolved.

The most relevant insight emerging from figure 5 is the fact that when it comes to competences, differently from skills, the distribution is more equal among the different 4 kinds of design thinking. As a matter of fact, the only paradigm that requires a different distribution is the creative confidence that differently from the other three shows a peak in the collective leadership. Another interesting evidence is the fact that both creative problem solving and innovation of meanings are requiring a higher creative competence compared to the other approaches. This is due to the fact that creativity is both required in the initial phase of the creative problem solving and innovation of meaning even if the aim of the two approaches is different. Indeed, in creative problem solving the creativity is a competence required for generate a high number of new solutions (Jonson, 2005) while in innovation of meaning creativity is crucial to envision a new direction and considering that it is an inside out approach (Verganti, 2017) is fundamental that the people involved in the project master this competence very well otherwise the first envision of the new direction will be less meaningful than expected. The comparative analysis shows how the competences varies over the four kinds of design thinking and this enriches the knowledge on the capabilities that are more relevant in order to offer design thinking services with different aims.
Finally, the comparative analysis on the key attitudes reports how optimistic mindset is relevant in all the 4 kind of design thinking. The only one in which is just close to the average is in sprint execution while in the other 3 is way above the average. This is in line with the literature of design thinking that reports how this approach should embrace a positive perspective on wicked problems (Carlgren et al., 2016; Calabretta and Kleinsmann, 2017). Moreover, this investigation shows how this competence is cross approach and it is not just relevant in the creative problem solving but it reinforces the value of such soft skill across the different paradigms. The other interesting elements coming from the cross comparison is the fact that pragmatism is a key attitude for sprint execution while is less relevant in the other paradigm. This evidence is coherent with the idea of the agile and scrum methodologies (Sommer et al., 2015) as well as with the design sprint where the orientation toward the resolution of difficult challenges in a practical way is the core goal of these approaches. What is the added value of this research being the fact that in the sprint execution all the other attitudes are equally distributed while the 130 respondents believe that pragmatism attitude is of primary importance as attitude of the team. Finally, empathy shows a significant relevance in creative confidence and creative problem solving while it is less relevant in sprint execution and innovation of meanings. This aspect is interesting because it stresses the relevance in the attitude of the people that should be involved. As a matter of fact, if the focus of the project is on the what (creative problem solving) dimensions or on the who (creative confidence) user needs both inside and outside the team are really important while if the focus is on the how (sprint execution) or on the why (innovation of meanings) the empathy is less relevant. This is counterintuitive because traditional view of design thinking (Buchanan, 1992; Brown, 2009, Martin, 2009) stress the centrality of the human and the crucial role played by the empathize phase while this investigation shows how the empathy is differently relevant in different kinds of design thinking.
Conclusion

As previously mentioned, the investigation aims at enriching the knowledge of both academics and practitioners on the different capabilities that are relevant and significant in order to offer different design thinking services. In particular by leveraging the results emerging from a survey performed in the Italian market the paper shed lights on the skills, competences and attitudes that are relevant in four different kinds of design thinking. As shared in the discussion part depending on the fact that the innovation project aims at answering to different questions the sets of capabilities that are more relevant are different. Indeed, if the question is what the possible ideas are to address a user need, how can we execute rapidly an explorative test of a solution, who are the people inside the organization that can be better engaged in the innovation process or why people should love the new direction the mix of capabilities required are different. So, by shedding lights on the capabilities the investigation enriches the theoretical knowledge of academics on the fact that the design thinking is evolving from a process to ideate and generate new ideas to a structured methodology to execute, engage and envision. This are the main elements behind the four kinds in order: creative problem solving, sprint execution, creative confidence and innovation of meaning. This is the first contribution of the study. In other words, supporting the fact that the four kinds are not only differentiated by the related aims, questions or process but are also different for the kind of skills, competences and attitudes required in order to be offered to companies. This is an important contribution to the growing streams of design thinking due to the fact that it contributes to a under researched perspective of it that is the capabilities of the teams involved.

Concerning the managerial implication of the study the investigation is important for the practitioners for two main reasons. First because it guides the managers that want to offer design thinking services in better comprehend which set of capabilities are relevant for the team. Second because it could suggest the facilitator of design thinking services on selecting the tools that are more aligned with the skills, competences, attitudes that are required by each approach. This both in term of increasing the probability that people would adopt them due to the alignment with their capabilities and for increasing their capabilities in that direction and so increasing the likelihood of a meaningful results.

Finally, similarly to all the existing academic articles also in this case there are limitation of the research. First the fact that the survey was delivered only to the Italian market could limit the generalizability of the research. Second the study is performed on four kinds of design thinking due to the previous research performed by the
authors and to the fact that this are the most popular one but there are no limits to the possibility of adding others kinds in future investigations. Finally, the sample size, even if quite focused and reliable is for sure not extensive. From these limitations are generated the possible future avenues of research. Of course, a survey that covers more nations could bring more insights, maybe also considering the impact of the national culture. In addition to these researchers could explore a different distribution of the capabilities in order to understand if the degrees of skills, competences and attitudes is valuable. Finally, an extension of the sample also involving the team level and not only the managers of the project could enrich the knowledge on the whole team capabilities and not only on the one perceived as relevant from the service provider perspective.

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