



# Meanings of Design in the Next Era

21-23 October 2019, Osaka, Japan



4D · DESIGNING DEVELOPMENT  
DEVELOPING DESIGN

## Conference Proceedings



4D · DESIGNING DEVELOPMENT  
DEVELOPING DESIGN

## **Conference Proceedings**

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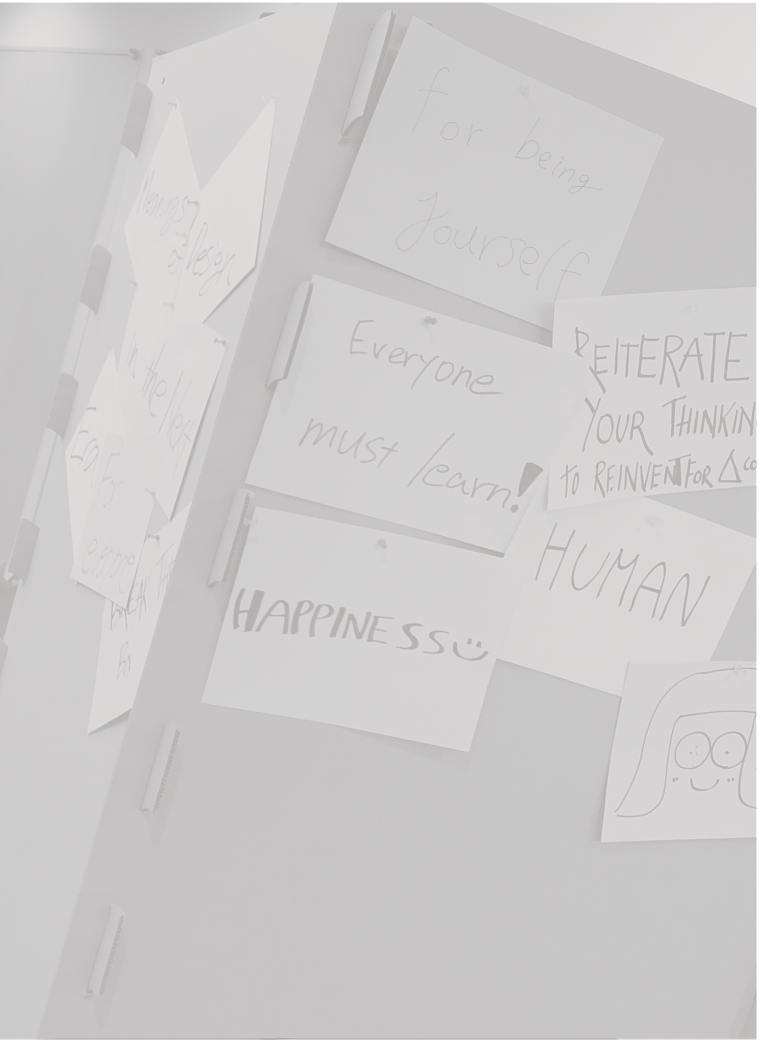
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## About the Conference

4D is an international conference aimed to discuss the role of Design in developing value for social entities, technological advancement, and business creation and revamping. This conference is the second in the series of the 4D Conference since 2017. The first conference was organized in Kaunas, Lithuania.

Modern and nascent economies indeed are adopting design as a competitive lever to embed continuous and discontinuous technology in new product language as to propose new entrepreneurial ventures. Moreover design has become a strategic lever for social entities to run fund-raising, to create new user engaging logic's, to combine social and economic value.

Specifically 4D conference embraces both perspectives:

### **“designing development”**

where design is the main input to create feasible conditions to enhance social values, to diffuse new technology paradigms and to create new ventures.

### **“developing design”**

where design is the “output” of the inter-playing of social, economic and technological supporting forces.

The conference is organized within 3 tracks:

### **TRACK 1: Meanings of Design in Social Development**

Topic 1.1: Design for the Future Craftsmanship

Topic 1.2: Design for Third Sector and Social Innovation

### **TRACK 2: Meanings of Design in Technological Development**

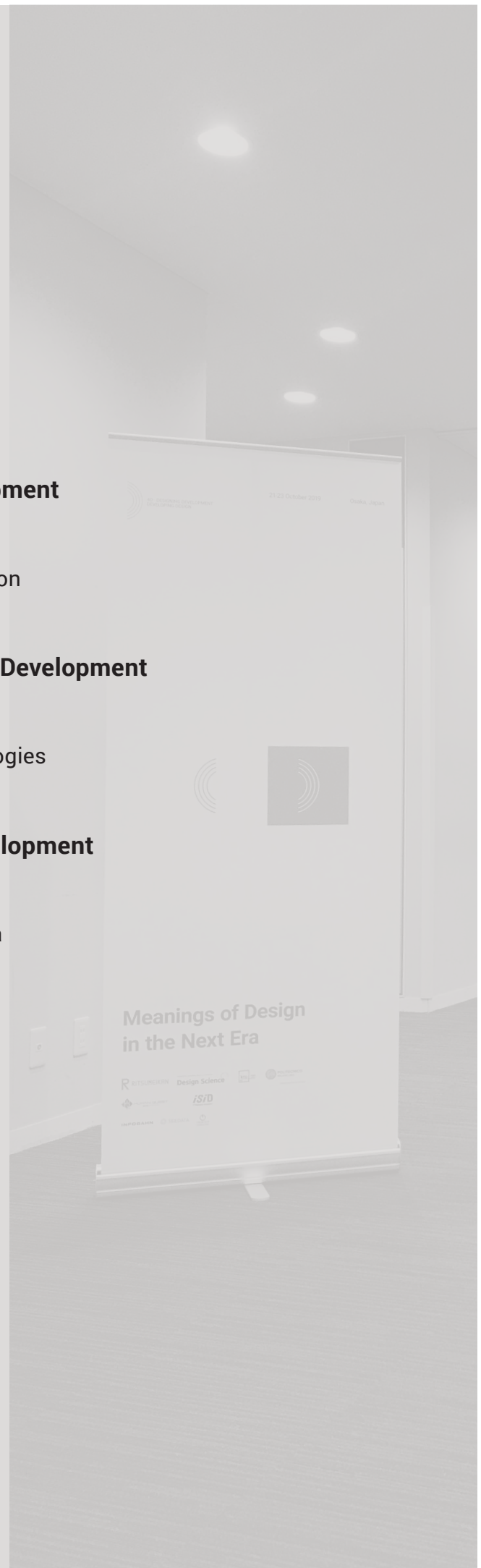
Topic 2.1: Design for New Paradigms in Production

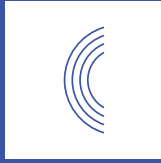
Topic 2.2: The Role of Design in Humanizing Technologies

### **TRACK 3: Meanings of Design in Business Development**

Topic 3.1: Designing Tradition in Global Markets

Topic 3.2: Design for Business in the Post-human Era





## **TRACK 3: Meanings of Design in Business Development**

### **Topic 3.2: Design for Business in the Post-human Era**



# The Hidden Values Related to The Variety of Design Thinking Models

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**Abstract:** Design Thinking (DT) is spreading in business community as a relevant innovation practice to change product and services. The term is more and more used and discussed, so this article – leveraging a literature review of 15 years – aims to find and to show the explicit value generated by the different DT patterns as recognized by literature and – going through a more deepening and complementary literature analysis – it expresses some hidden values associated to the four main patterns of DT.

A growing stream of literature in last years - on one hand - deepened the underpinning constructs and the founding principles of DT intended in a first frame as a “Creative Problem Solving” approach – on the other hand - it stretched the application of DT to novel scopes and fields embracing novel principles and practices. Creative problem solving – for instance – is mostly recognized for the value of “ideating”, recognizing the variety and the number of different ideas to solve a user problem. On the other hand, the principles embedded in it – as abductive reasoning, “reframing”, quick prototyping – seem to recall the same principles of “lean entrepreneurship”. Moreover, the emerging need related to digital environments to quickly test and grasping feedbacks from the user induced a new way to apply DT mostly pushing on the execution phase. “Sprint” is a process-oriented to produce insights from mapping and analyzing user behaviours, to take a fast decision about new interactive concepts and rapidly build “Minimum Viable Products” to accumulate learning and iteratively change the outcomes. Even this aspect seems to be connected and strengthen the lean entrepreneurial literature stream. DT, furthermore – leveraging people creativity – needs to continuously engage employees and stakeholders in compelling and motivating ways. Given that everyone assumes a personalized role in contributing to the creative process, an emerging challenge of DT consists to increase the “creative confidence” of individual and teams. At this level, DT seems to be more internally oriented – nurturing the knowledge and human capital of organizations – instead of placing novel solutions on the marketplace.

**Keywords:** Design thinking; Design for entrepreneurship; Creative confidence; Digital execution

## Introduction

A controversial and growing debate about design thinking is taking place both among the practitioners’ context as for the academic one. This is impacting the boundaries of design discipline itself and the relationship with other domains as entrepreneurship and innovation management.

During the last two decades, *design thinking* has been critically analysed by both scholars from design and business and management disciplines. Most of the recent literature consolidated the positive



implications of design thinking for innovation, strategic options generation and management education (Beckman & Barry, 2007; Glen et al., 2014; Garbuio et al., 2015).

This growth of interest around design approach, methods and tools raise from the evolution of design discipline itself, which is progressively shifting toward ways of thinking and doing, oriented on designing solutions, intangible offerings addressing complex problems (Zurlo and Cautela, 2013).

The first appearance of design thinking according to the literature (second half of the twentieth century) consists on the historical debate around the science of design and natural sciences from Simon and Schön. Their theories are followed by the researches of other important design scholars which develop the concept of these *designerly ways of knowing* (e.g., Cross, 1982, 2007).

More recent studies define design thinking like a successful approach and practice for businesses which aim to innovate (Brown, 2008, 2009; Martin, 2009): a series of tools and methods that support companies in facing and solving complex problems.

The current and continuous transformation of the definition of this approach, identifies designers' main role as delivering the appropriate solution by "organizing complexity [and] finding clarity in chaos" through a combined process of synthesis of aesthetic, cultural, and technology trends that involve consumer and business needs (Kolko, 2010). Hence, design thinking is nowadays considered as an attitude to deal with complex and uncommon subjects that have uncertain answers and solutions (Burnette, 2018).

Starting from the *design thinking* evolution, this article tries to articulate what Buchanan identifies as the *pluralism of design* thinking (Buchanan, 2015), in particular defining different specific patterns of DT emerging from the design and management and innovation literature, where pattern is intended as a current frame with specific theoretical boundaries, set of values, scope and contexts of application. To address these questions a literature review process has been performed on a timeline of 23 years including both the design literature as the business and management one. The process has been conducted exploring the presence of *design thinking* within the main academic electronic database; different specific criteria of relevance and citations number were adopted in order to refine the sample of the review, combining an accurate process of reading of abstracts and articles.

The defined list of sources which have been analysed, clearly shows the emerging changes of scopes and fields of the application of DT in literature. This analysis supports the definition of the three specific theoretical patterns: the first one *design thinking as creative problem solving (CPS)* that is the most consolidated and is defined as the foundational model, in which the subject of DT consists of the innovation of products and services starting from user needs; the second pattern deals with the changes of process and procedures in the consolidated context of digital ecosystem and is named here as *digital execution catalyst*; thirdly *design thinking as creative confidence enabler (CC)* embraces the subject of human capital and the set of values in organizations, aiming at nurturing the organization culture and the employees mindset in working contexts.

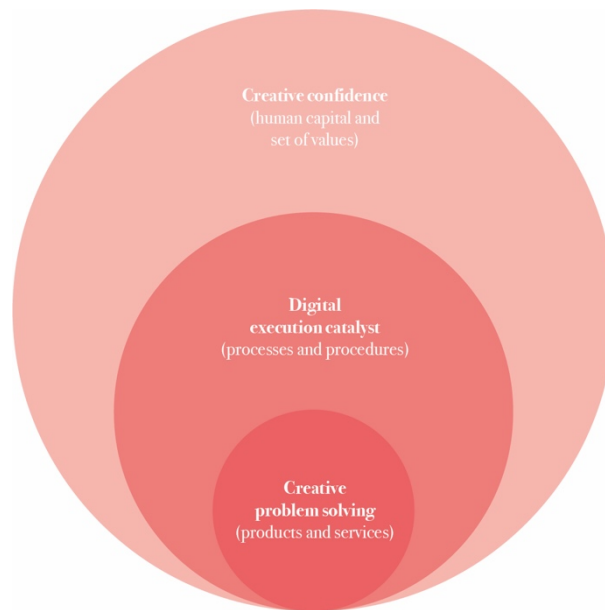


Figure 1: The three theoretical patterns identified in design thinking evolution

Each of those outlined patterns are explored within the article showing the different explicit values, approaches and contexts of application. Moreover, each of them is critically and deeply investigated in order to show some implicit values that may be considered a key factor for future development of DT.

The article is divided into 4 main parts. Following, the methodology part presents and examines the process of literature review in detail, illustrating the overview and structure of results. As second part, the main theoretical findings are presented with a description of the explicit values related to each of the 3 patterns, moreover, presenting the implicit and more hidden values for each of them. A discussion part follows where the contribution to the literature is shown.

## Methodology

The literature review process started with questions like “How much the literature on design thinking admits a unique theoretical model? What are the main sources that underline the different patterns of design thinking during its evolution in the period from 1995 to 2018? What are the key aspects that represent each pattern?”. The research was focused on understanding the main related contents inside the academic sources.

In order to find academic material that can provide appropriated answers to the previous questions, it was conducted a search using academic electronic databases and journals. For the academic electronic database, Scopus, Web of Science and Jstor were adopted. Moreover, informal methods such as Google Scholar were included in order to expand the number of resources to be analysed and have the possibility to get a greater overview on the subject.

The literature review process was made on sources coming from both the design and the management and innovation fields.

The analysis was conducted searching “design thinking” inside parameters as field, title or abstract. Moreover, the obtained list was refined taking the first 50 results for both relevance and citations up of 15. Later, the database was further refined considering the relevance of the results while reading all

abstracts and selecting just the more appropriate with the objectives of the research. This last operation resulted in a reduced list of sources, because some of them were then ignored.

Indeed:

- on Scopus the research was made searching for “design thinking” inside the title AND abstract AND keywords, and refining the results taking just those up 15 citations and most relevant papers; the database provided 47 results coming from the previously described analysis;
- on Jstor the research was filtered searching “design thinking” inside title AND abstract and filtering for relevance; in the present case, the results were 29; relevance on Jstore is a combination of analysis of unique terms in the searching words with phrase searching matches;
- on Web of Science, it was searched for “design thinking” inside title AND topic, crossing results with the first 50 more cited (up of 15) plus 50 most relevant items; here, the total result was composed of 78 sources; relevance in Web of Science is intended as “sorts records in descending order based on a ranking system that considers how many of the search terms are found in each record. Records with the highest ranking appear at the top of the list”;
- on Google Scholar the logic used was to search “design thinking” inside title OR abstract and refining the results taking just the first 50 more relevant; according to the Google Scholar website, relevance ranking “takes into account the full text of each source as well as the source's author, the publication in which the source appeared and how often it has been cited in scholarly literature”.

From this process, a list of 146 sources to be analyzed for the review was obtained, without considering the repeated elements from the different researches.

Later, through the last screening process conducting an abstract review, the final sample resulted in a list of 77 sources, from 2000 to 2018. It includes books (12), book section (7), conference papers (6) and journal articles (51).

In the following table are summarized the number of sources, that during the review process conducted on abstracts, were associated with each of the three patterns.

Table 1: Sources identified for each pattern.

Creative problem solving	Digital execution Catalyst	Creative confidence
38	41	33

Annex 1 provides an overview of the sources analysed for the development of this research, divided for each of the three patterns. The first results obtained for this research are around 2000 for CPS, while from 2005 from the other two patterns. All these results increase exponentially after 2005, where it is possible to notice a small reduction for the first two after 2016, while CC still continue to have the same presence in literature, as shown in figure 2.

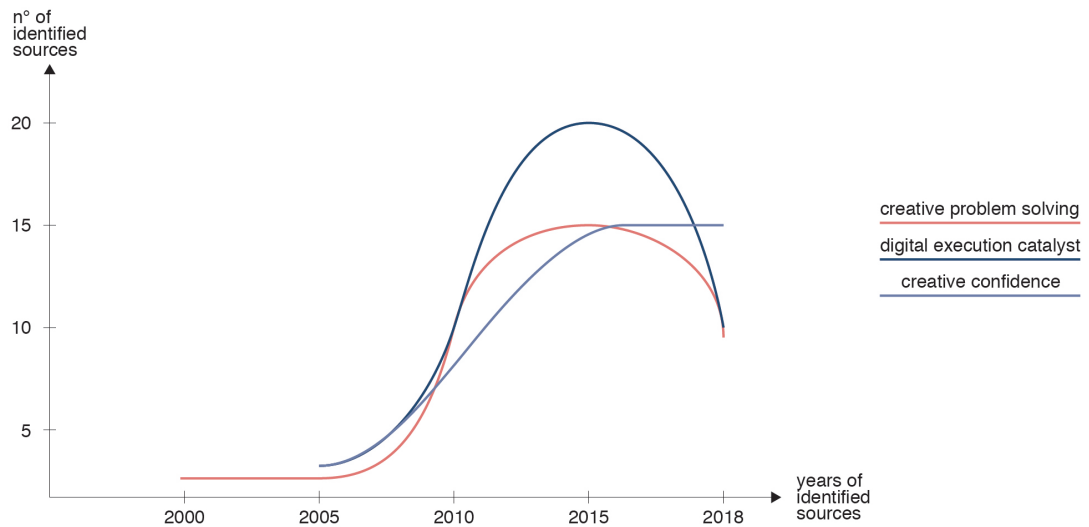


Figure 2: Evolution of the three patterns in literature

In the next chapters each of the three design thinking models/ patterns identified from the literature review are presented starting from their origin and scope than summarising the main values, approaches and contexts of implementation.

The literature review conducted on the final 76 sources presented a huge contribution for the explicit values discussion part, while sources containing references or contents to be inspired for the hidden values of each discussed patterns were present in a very limited amount.

Table 2: Percentage of final sources containing both explicit and implicit values references.

	Creative problem solving	Digital execution catalyst	Creative confidence
Percentage from the 76 final sources, containing references for explicit values	55%	54%	45%
Percentage from the 76 final sources, containing references for implicit values	11%	9%	12%

## Theoretical findings

### *DT as creative problem solving – explicit values vs implicit hidden contributions*

Explicit values: In the different meanings associated with design thinking, the first most diffused theorization is associated with its value as creative problem solving. Creative problem solving (CPS) is an iterative process that starts from insights about end-users, passing through idea generation and testing, arriving to implementation.

Designers ask “what if?” questions to hypothesize future scenarios, producing a new way to solve problems, more than accepting the way things are done now. Thanks to this creative way of solving problems, designers can turn their hands to nearly anything (Kimbell, 2011).

Dorst (2011) evidences the differences between common humans’ and designers’ problem-solving processes. The first is based on the equation that

WHAT (thing) + HOW (working principles) leads to RESULTS;

while the latter, the design one, it is concentrated to achieve the value that the users want through

WHAT (thing) + HOW (working principles) leads to VALUE.

What usually happens in this case, it that for designers is known both the value to create and the 'how', that will allow reaching this value. Usually, they create the 'what' (an object, a service, a system), that is missing, providing a different way to solve the problem.

The solution in the design process is different because it assumes that designers empathize not only with the end-user, but even with any stakeholders that can return pain points to address the solution. Moreover, design focus on both convergent and divergent phases, during which, in particular in the ideation phase, develop several solutions to respond to the initial challenge. The CPS doesn't stop to the first idea, going through different solutions; seeking for a wide idea variety; this is the reason why ideation is much more than just a eureka moment (Onarheim and Biskjaer, 2015).

This way of acting recognizes CPS as a process to provide novel solutions (products as services), that make important the adoption of DT also inside the entrepreneurial world. It is widely recognized that design and design thinking can help to shape a company's vision and strategy, which is something that is consolidated in a lot of important contributions in literature, such as from Roger Martin, Tom Kelley or even Tom Peters. One of the aims of this paper is to underline the different aspects and approaches coming from design thinking that are recalled in the entrepreneurial world, and in particular to the lean entrepreneurship, considering its theoretical foundation and underlying constructs. Analysing the two domains, it is possible to recognize a series of characteristics that design thinking recalls the lean entrepreneurship context.

Implicit values: The lean entrepreneurship takes his nature from the lean principles, developed in the early seventies by Toyota in Japan, called lean manufacturing. The concept, initially created to optimize production processes (Womack, 2003), making it more efficient by reducing any sort of waste, has been become also important for other disciplines. Lean entrepreneurship lays upon the principles of the lean theory, that are applied to companies to reach the most efficient innovation that the user can demand. This entail is important to avoid the creation of a product or service that nobody needs. Here, it is possible to recognize the first contribution that design thinking, indirectly gave to lean. The nature of design thinking can help to build concepts, products and services that consider real-live-problems as an impulse for development (Von Kortzfleisch, Zerwas and Mokanis, 2013).

The ability to address and overcome wicked problems is a key element of the design approach that provides possible solutions to the uncertainty that characterize the real environment and the consequences that can arise from determinate solutions (Sarasvathy, 2004; Sarasvathy et al., 2008). Also, the importance of empathy and the ability to use it, it is a fondant element in design thinking that has been acquired from the lean entrepreneurship. This element allows addressing explicit or latent needs, that after a long practice in design thinking, has been acquired in the lean entrepreneurship practice. Even if the design process could start from some initial specification, clients and customers can not recognize what they want until they can see what they can get. This reinforces the iterative nature of the design process (Glen, Suciú and Baughn, 2014). The ability to collect and process inputs, it is one of the most consolidated aspects in design thinking, where is searching the present for available paths to desirable futures (Krippendorff, 2006).

Design thinking prototype solutions to observed problems, in order to then test the results and observe the results. Also, in this case, design thinking represented the fertile soil for a similar way of proceeding that is embedded in the lean processes. Solutions coming from the design field try to foster innovation,

through desirable, viable and feasible solutions (Brown, 2009), three criteria which were inherited in lean.

Lastly, design thinking and lean entrepreneurship both test hypothesis. In the same vein the inception of a new venture as in the design thinking the problem framing activity assume at their base some starting (business) assumptions on which business hypothesis refer. Assumptions, hypothesis formulation and testing can be considered another common ground where the primary version of Design Thinking – known as creative problem solving – and lean entrepreneurship join.

### *DT as digital execution catalyst – explicit values vs implicit hidden contributions*

Explicit values: Some of the values which characterize the Design thinking approach since its origin, perfectly fit with the current market trends and behaviors such as the obsessing need of shortening the time to market also due to the rise of the so called digital era: nowadays almost all the offering panorama is populated by products and services which are software-driven. DT's characteristics such as iterative workflow and flexible process framework which comprises continuous step of visualization and prototyping, can support businesses in delivering solution rapidly and customized on users' expectations. Therefore, the second theoretical pattern presented in this article defines DT as a digital execution catalyst.

Starting from fundamental literature, designers don't rely just on traditional rational analytic techniques, but they refer to other tools and methods; designers usually work visually, transforming information into tangible images (Cross, 1982, 2006; Lawson, 2006). Moreover, prototypes also have a key role in the design process: it is possible to better clarify the idea and its characteristics, having the possibility to perform critical considerations and to obtain feedbacks. Indeed, the entire design-thinking process is characterized by active learning and experimentation (Brown, 2008, 2009; Leidtka & Ogilvie, 2011).

Rapid creation of low-fidelity prototypes makes stronger the dialogue with potential users, allowing also to better clarify the nature of the problem to be solved (Moggeridge, 2007).

In this way is continuously possible to concentrate on actual problem for the user, preventing the possibility to create products that are not desirable and that nobody really needs or want. This is becoming more and more a crucial aspect for businesses that have to deal with customers much more demanding in terms of customization, speed, and involvement with the value proposition of today's services and products.

These are DT's evident benefits to be adopted in order to face and adapt to the velocity of the digital economy ecosystem and market: working groups, in facing complex problem, need methods and tools for generating alternative solutions and for testing them in an extremely short time frame. In this sense DT can be the activator, the catalyst and guides these fast testing process through the realization of digital prototypes.

Implicit values: Within this theoretical pattern "Sprint: How to Solve Big Problems and Test New Ideas in Just Five Days" written by Jake Knapp, based on his experience in facing innovation challenge in Google and Google ventures, can be considered the bridging book among design thinking and digital and data driven innovation. Reading between the lines, the adoption of DT in a digital context is not only about shortening the process of "going to the market" and reducing the failure possibilities but is about impacting the whole culture of innovation within procedures and routines for innovation; in order to remain competitive, companies redesign their existing development processes splitting it in short deadlines and aiming at iteratively prototype solutions; defined as the most important aspect to

be considered the precise moment in which the potential customer meet the offering (product/service).

Thus, organizational procedures to face complex challenge are renovated in order to constantly capture the customer needs, rapidly conceive innovative, highly customer-oriented solutions, and perform these developments with an increasingly short time-to-market.

DT as a digital execution catalyst could be effectively adopted by organizations in:

- managing risk by doing a tangible and visible test before starting a large project;
- generating fast solutions in light of an approaching deadline;
- facilitating innovation and providing inspiration to easier the process of adoption of a fresh and disruptive approach.

### *DT as creative confidence enabler – explicit values vs implicit hidden contributions*

Explicit values: The third and most recent model of design thinking refers to the applications of design methods, tools, technique and processes to the way people work (Kolko, 2015). Those processes are more often conducted as collaborative activities, involving multiple kinds of stakeholders that can vary from employees of different departments of the same organization to potential final users of the new product/service to be developed.

Therefore, in this theoretical pattern, co-design approach act as main actor in the process of implementation of design thinking. The user is engaged in the creative process not just at the beginning. Users instead, become more participative for the whole process: the involved actors considered are not just the final customers, but also other stakeholders that take part along all the process. In this way, the co-design might be implemented to produce a practical resolution to complex problems at different levels within the innovation process.

In this sense, design thinking is impacting on how organizations develop their creative asset: enabling the employee to create, dare and nurture their mind-sets with creative confidence (Kelley T. and D., 2013). The current debate (both design and management areas) recognized that DT is not only relevant for innovating product and services but it influences organizational culture and behavior. The “object” to be designed is shifting to new organizational constructs such as organizational cultures, organizational and business models (Kelley T. and D., 2013; Buchanan, 2015).

Thus, the value of design thinking must be reviewed “as more than a set of tools and, instead, as a cultural component of organizations” (Elsbach, Stigliani 2018). This cited article published on the *Journal of Management* from Elsbach and Stigliani can be considered as the one which most recently emphasized how organizational culture is benefitting from the design thinking’s spillover in organization’s tactical issues, operations, vision, strategy and moreover human capital.

In the actual business context, the technical and technological progress plus the changes in the socio-cultural dynamics are obliging enterprises to adapt or even anticipate changes. This includes the readiness for modification when employees are not motivated with the existing organizational culture: thus there are recurring difficulties for organization in retaining talents.

Scholars and practitioners are exploring how design thinking is releasing deep effects on organizational culture, where organizational culture is defined as comprising the underlying norms, values, and assumptions that define the "right way" to behave in an organization (Schein, 2010).

Implicit value: What is emerging is that the effective use of design thinking tools in organizations had a profound effect on organizational culture and, on the other hand, organizational cultures influenced (both positively and negatively) the use of design thinking.

Thus, can be emphasized an intertwined relationship between organizational day-to-day practices (what people do) and culture. DT acts as a mean of link between the operative and the strategic levels of change, and this can enable organizations (public or private) to overcome some of the limits and inefficiencies of the established practices (Deserti e Rizzo, 2014).

In this theoretical pattern than, the implementation of design thinking is strongly intertwined with the update of the knowledge capital and how organization learns: the experiential soul of design tools, methods and practices are in line with the importance of real-life experience as a central topic in learning within organizations.

The process of adoption of design thinking at this level of complexity has different nature and obviously various factors of difficulty. As stated by David Dunne in his recent book “design thinking at work” DT has existed for decades, however many still perceive it as an unstructured creative process rather than as a careful, reflective discipline (Dunne, 2018). Even if an authentic design mindset is very hard to instill within non design organizations, DT can be *creative confidence enabler* through the patience and long-term commitment from designers, the organization and its leaders.

## Discussion

The article pinpoints how design thinking evolved from a product-service innovation approach to an activity able to forge the innovation routines and the organizational culture.

The article tries to provide an integrated framework connecting different literature streams in order to recall some “bridging concepts” that connects DT to other organizational and entrepreneurial practice.

From one hand DT is penetrating digital transformation providing consolidated heuristics and tools that the development of digital artifacts and ecosystem nowadays fully adopts; on the other hand, the recognized impact of DT on organization culture and entrepreneurial process seem to open new paradigmatic forms of Design Thinking.

The different patterns highlighted open new research avenues in DT. First the application of DT to digital environment risk to change the basic intrinsic principles of DT. What does it mean “reframing” in digital environments? What is the limit of reframing and divergence in a context where artifacts are mainly influenced by human interaction rules and fixed scripts?

On the other hand, the penetration of DT in organization culture opens new avenues for studying the real impact on employees’ sense of belonging, their satisfaction and the relative rewarding model. Does DT really affect the sense of belonging of employees?

After the time of the diffusion of DT in extraneous field, maybe it’s the time to launch new research avenues that investigate the real impact and the contextual factors that are – or not – really changed by the adoption of DT.

## References

- Abrell, T. (2016). *Design thinking and corporate entrepreneurship: An integration and avenues for future research*.
- Ambrose, G., & Harris, P. (2009). *Basics design 08: design thinking*. Bloomsbury Publishing.
- Bason, C. (2010). Design thinking in government. In *Co-Creating for a Better Society. Leading public sector innovation* (1st ed., pp. 135–150).
- Beckman, S., & Barry, M. (2007). Innovation as a Learning Process: Embedding Design Thinking. *California Management Review*, 50.



- Berglund, A., & Leifer, L. (2017). Beyond design thinking - Whose perspective is driving the people-Centric approach to change? *Proceedings of the 19th International Conference on Engineering and Product Design Education: Building Community: Design Education for a Sustainable Future, E and PDE 2017*, 613–618.
- Beverland, M. B., Wilner, S. J. S., & Micheli, P. (2015). Reconciling the tension between consistency and relevance: design thinking as a mechanism for brand ambidexterity. *Journal of the Academy of Marketing Science*, 43(5), 589–609.
- Bjogvinsson, E., Ehn, P., & Hillgren, P.-A. (2012). Design Things and Design Thinking: Contemporary Participatory Design Challenges. *DESIGN ISSUES*, 28(3), 101–116.
- Brenner, W., Uebernickel, F., & Abrell, T. (2016). *Design thinking as mindset, process, and toolbox: Experiences from research and teaching at the university of St.Gallen*.
- Brereton, M., & McGarry, B. (2000). An observational study of how objects support engineering design thinking and communication: Implications for the design of tangible media. *Conference on Human Factors in Computing Systems - Proceedings*, 217–224.
- Brown, T. (2008). Design thinking. *HARVARD BUSINESS REVIEW*, 86(6), 84+.
- Brown, T. (2009). *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*. Harper Collins.
- Brown, T., & Martin, R. L. (2015). Design for Action. *Harvard Business Review*, (September 2015).
- Brown, T., & Wyatt, J. (2010). Design thinking for social innovation. *Development Outreach*, 12(1), 29–43.
- Buchanan, R. (2008). Introduction: Design and Organizational Change. *Design Issues*, 24(1), 2–9.
- Buchanan, R. (2015). Worlds in the Making: Design, Management, and the Reform of Organizational Culture. *She Ji: The Journal of Design, Economics, and Innovation*, 1(1), 5–21.
- Burdick, A., & Willis, H. (2011). Digital learning, digital scholarship and design thinking. *Design Studies*, 32(6), 546–556.
- C. Stewart, S. (2011). Interpreting Design Thinking. *Design Studies - DESIGN STUD*, 32.
- Carlgren, L., Elmquist, M., & Rauth, I. (2014). Design Thinking: Exploring Values and Effects from an Innovation Capability Perspective. *The Design Journal*, 17(3), 403–423.
- Carlgren, L., Rauth, I., & Elmquist, M. (2016). Framing Design Thinking: The Concept in Idea and Enactment. *CREATIVITY AND INNOVATION MANAGEMENT*, 25(1), 38–57.
- Chen, S., & Venkatesh, A. (2013). An investigation of how design-oriented organisations implement design thinking. *Journal of Marketing Management*, 29(15–16), 1680–1700.
- Cooper, R., Junginger, S., & Lockwood, T. (2009). Design Thinking and Design Management: A Research and Practice Perspective. *Design Management Review*, 20(2), 46–55.
- Cross, N. (2011). *Design thinking: Understanding how designers think and work*. Berg.
- De Paula, D., Dobrigkeit, F., & Cormican, K. (2018). From team collaboration to product success: The domino effect of design thinking. *Proceedings of NordDesign: Design in the Era of Digitalization, NordDesign 2018*.
- Design and Organizational Change in the Public Sector - Deserti - 2014 - Design Management Journal - Wiley Online Library*. (2014).
- Dorst, K. (2011). The core of “design thinking” and its application. *Design Studies*, 32(6), 521–532.
- Dorst, Kees. (2010). The nature of design thinking. *Design Thinking Research Symposium*. DAB Documents.
- Dunne, D. (2018). *Design Thinking at Work: How Innovative Organizations are Embracing Design*. Toronto ; Buffalo: Rotman-UTP Publishing.
- Dym, C. L., Agogino, A. M., Eris, O., Frey, D. D., & Leifer, L. J. (2005). Engineering design thinking, teaching, and learning. *Journal of Engineering Education*, 94(1), 103–119.
- Edited by Richard J. Boland, J. F. C. (2004). *Managing as Designing*.
- Elsbach, K. D., & Stigliani, I. (2018). Design Thinking and Organizational Culture: A Review and Framework for Future Research. *Journal of Management*, 44(6), 2274–2306.
- Geihs, K. (2014). Toward Multidisciplinary Design Thinking. *COMMUNICATIONS OF THE ACM*, 57(4), 9.

- Grots, A., & Creuznacher, I. (2016). *Design Thinking: Process or culture?: A method for organizational change*.
- Johansson-Skoeldberg, U., Woodilla, J., & Cetinkaya, M. (2013). Design Thinking: Past, Present and Possible Futures. *CREATIVITY AND INNOVATION MANAGEMENT*, 22(2), 121–146.
- Junginger, S. (2009). Design in the Organization: Parts and Wholes. *Research Design Journal*, 23–29.
- Kelley, T., & Kelley, D. (2013). *Creative Confidence: Unleashing the Creative Potential Within Us All*. New York: Currency.
- Kim, J., & Ryu, H. (2014). A design thinking rationality framework: Framing and solving design problems in early concept generation. *Human-Computer Interaction*, 29(5–6), 516–553.
- Kimbell, L. (2012). Rethinking design thinking: Part II. *Design and Culture*, 4(2), 129–148.
- Kimbell, Lucy. (2011). Rethinking Design Thinking: Part I. *DESIGN AND CULTURE*, 3(3), 285–306.
- Kolko, J. (2010). Abductive thinking and sensemaking: The drivers of design synthesis. *Design Issues*, 26(1), 15–28.
- Kolko, J. (2015). Design thinking comes of age. *HARVARD BUSINESS REVIEW*, 93(9), 66–71.
- Kummitha, R. K. R. (2018). Institutionalising design thinking in social entrepreneurship: A contextual analysis into social and organizational processes. *Social Enterprise Journal*, 14(1), 92–107.
- Leavy, B. (2010). Design thinking – A new mental model of value innovation. *Strategy & Leadership*, 38, 5–14.
- Leifer, L., & Steinert, M. (2011). Dancing with Ambiguity: Causality Behavior, Design Thinking, and Triple-Loop-Learning. *Information-Knowledge-Systems Management*, 10, 151–173.
- Leikas, J. (2009). Traditional design thinking. In *VTT Publications: Vol. 726. LIFE-BASED DESIGN: A HOLISTIC APPROACH TO DESIGNING HUMAN-TECHNOLOGY INTERACTION* (pp. 16–67).
- Liedtka, J. (2014). Innovative ways companies are using design thinking. *Strategy and Leadership*, 42(2), 40–45.
- LIEDTKA, J., KING, A., & BENNETT, K. (2013). Scaling a Design Thinking Competency at Intuit. In *Ten Stories of What Works. Solving Problems with Design Thinking* (pp. 179–195).
- Liedtka, Jeanne. (2015). Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction. *JOURNAL OF PRODUCT INNOVATION MANAGEMENT*, 32(6), 925–938.
- Liedtka, Jeanne, & Ogilvie, T. (2011). *Designing for Growth: A Design Thinking Tool Kit for Managers*. Columbia University Press.
- Lindberg, T., Meinel, C., & Wagner, R. (2011). Design Thinking: A Fruitful Concept for IT Development? In Plattner, H and Meinel, C and Leifer, L (Ed.), *DESIGN THINKING: UNDERSTAND - IMPROVE - APPLY* (pp. 3–18).
- Martin, R. (2010). Design thinking: Achieving insights via the “knowledge funnel.” *Strategy & Leadership*, 38, 37–41.
- Melles, G., de Vere, I., & Mistic, V. (2011). Socially responsible design: thinking beyond the triple bottom line to socially responsive and sustainable product design. *CODESIGN-INTERNATIONAL JOURNAL OF COCREATION IN DESIGN AND THE ARTS*, 7(3–4, SI), 143–154.
- Michlewski, K. (2008). Uncovering Design Attitude: Inside the Culture of Designers. *Organization Studies*, 29(3), 373–392.
- Mintrom, M., & Luetjens, J. (2016). Design Thinking in Policymaking Processes: Opportunities and Challenges. *Australian Journal of Public Administration*, 75(3), 391–402.
- Müller, R. M., & Thoring, K. (2012). Design thinking vs. lean startup: A comparison of two user-driven innovation strategies. *Leading through Design*, 151, 91–106.
- Nielsen, S. L., & Stovang, P. (2015). DesUni: university entrepreneurship education through design thinking. *Education and Training*, 57(8–9), 977–991.
- Noweski, C., & Meinel, C. (2010). Mind the oddness trap! - Theory and practice in design thinking. *DS 66-2: Proceedings of the 1st International Conference on Design Creativity, ICDC 2010*.
- Owen, C. (2007). Design thinking: Notes on its nature and use. *Design Research Quarterly*, 2(1), 16–27.
- Pieniasek, M. (2017). Design thinking for social innovation. In C. Durkin & R. Gunn (Eds.), *Social entrepreneurship (second edition)* (REV-Revised, 2, pp. 65–70).

- Plattner, H and Meinel, C and Leifer, L (Ed.). (2016). Design Thinking Research: Making Design Thinking Foundational. In *DESIGN THINKING RESEARCH: MAKING DESIGN THINKING FOUNDATIONAL* (pp. 1–290).
- Porcini, M. (2009). Your New Design Process Is Not Enough—Hire Design Thinkers! *Design Management Review*, 20(3), 6–18.
- Razavian, M., Tang, A., Capilla, R., & Lago, P. (2016). In two minds: how reflections influence software design thinking. *Journal of Software: Evolution and Process*, 28(6), 394–426.
- Razzouk, R., & Shute, V. (2012). What Is Design Thinking and Why Is It Important? *Review of Educational Research*, 82(3), 330–348.
- Roberts, J. P., Fisher, T. R., Trowbridge, M. J., & Bent, C. (2016). A design thinking framework for healthcare management and innovation. *HEALTHCARE-THE JOURNAL OF DELIVERY SCIENCE AND INNOVATION*, 4(1), 11–14.
- Rosenberg, Sr., N. O., Chauvet, M., & Kleinman, J. S. (2015). *Leading for a Corporate Culture of Design Thinking*.
- Royalty, A., & Roth, B. (2015). *Developing design thinking metrics as a driver of creative innovation*.
- Rylander, A. (2009). Design thinking as knowledge work: Epistemological foundations and practical implications. *Design Management Journal*, 4(1), 7–19.
- Schumacher, T., & Mayer, S. (2018). Preparing Managers for Turbulent Contexts: Teaching the Principles of Design Thinking. *Journal of Management Education*, 42(4), 496–523.
- Seidel, V. P., & Fixson, S. K. (2013). Adopting Design Thinking in Novice Multidisciplinary Teams: The Application and Limits of Design Methods and Reflexive Practices. *JOURNAL OF PRODUCT INNOVATION MANAGEMENT*, 30(1), 19–33.
- Shapira, H., Ketchie, A., & Nehe, M. (2017). The integration of Design Thinking and Strategic Sustainable Development. *Journal of Cleaner Production*, 140, 277–287.
- Stephens, J. P., & Boland, B. J. (2015). The Aesthetic Knowledge Problem of Problem-Solving With Design Thinking. *Journal of Management Inquiry*, 24(3), 219–232.
- Thoring, K., & Müller, R. M. (2011). Understanding the creative mechanisms of design thinking: An evolutionary approach. *Proceedings of the DESIRE'11 Conference on Creativity and Innovation in Design*, 137–147.
- Tonkinwise, C. (2011). A taste for practices: Unrepressing style in design thinking. *DESIGN STUDIES*, 32(6, SI), 533–545.
- Verganti, R. (2017). Design Thinkers Think Like Managers. *She Ji: The Journal of Design, Economics, and Innovation*, 3(2), 100–102.
- Verity, J., & McCullagh, K. (2012). Design Thinking. In *NEW STRATEGIC LANDSCAPE: INNOVATIVE PERSPECTIVES ON STRATEGY* (pp. 52–68).
- Vogel, C. M. (2009). Notes on the Evolution of Design Thinking: A Work in Progress. *Design Management Review*, 20(2), 16–27.
- Wang, J. (2013). The Importance of Aristotle to Design Thinking. *Design Issues*, 29(2), 4–15.
- Ward, A., Runcie, E., & Morris, L. (2009). Embedding innovation: design thinking for small enterprises. *Journal of Business Strategy*, 30(2/3), 78–84.

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