A pragmatic path for strategic design: Influences from industrial design, cognitive studies and management sciences

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ABSTRACT

Strategic design was born in Italy, specifically at the Politecnico di Milano. Approaches with the same designation have been observed in other scientific communities; some of them tend to have weak theoretical backgrounds. In this paper, we present a new approach named pragmatic strategic design (PSD). The basis of PSD's pragmatist perspective is explored, and its key characteristics are described. PSD is concerned with real-life applications of Design in organizations. It privileges practice-based action, extrapolating mere technical approaches, favoring the design of product-service-systems. PSD is multidisciplinary. All variables that will be considered in a project are operationally described. It is concerned with user experience, which represents a strategic issue in many organizations. It deals with intuition through metadesign. PSD focuses on preferred outcomes, rather than likely ones.

Keywords: strategic design, pragmatic strategic design, pragmatic design, pragmatism.

INTRODUCTION

Strategic design was born at the Politecnico di Milano. It allows organizations to develop their own identities, offering social and market bodies a system of values, beliefs, rules and tools to evolve and deal with the external environment, changing and influencing it (Meroni, 2008, p.32). According to Zurlo and Cautela (2014), the focus of Design has been changing progressively from material objects to intangible aspects of the offering. "These intangible offerings not only included the use of the product but also aspects linked to the purchase experience, product access dynamics, product availability, and connections with other services and offerings." (p.19). Therefore, Design has been moving away from a sole responsibility for a technical approach to products, revealing an investigation field defined as strategic design.

Some international and Brazilian researchers have developed the area towards complexity (e.g., Manzini, 2015), yet often using pragmatic representations, such as diagrams. Other academics, including the authors of this paper, have focused more explicitly on its applied path, which is pragmatically oriented. Pragmatists have failed in theoretically define their approach to strategic design in the past. Therefore, in this paper, the authors discuss the basis of pragmatic strategic design (PSD), which is a form of evolution of this research field, as is the aforementioned complex path.

The main known pragmatists who contributed to the approach to PSD developed in this paper are Charles Peirce (1839-1914), William James (1842-1910) and John Dewey (1859-1952). Pragmatic perspectives refer to all methodological approaches that privilege whatever is practical and applicable (James, 1979). It is also a method in which researchers (designers, in this case) interpret reality, observing the practical consequences of their actions.

In "How to Make our Ideas Clear", Pierce (1878) rejected any possible a priori metaphysics and explanations of thought from intellectuals. Peirce grounded his work on what is called his "pragmatic maxim", which is a logical rule that evidences the emptiness of concepts without practical consequences.

Pragmatists prefer not to work away from facts, avoid dealing with abstractions, and talk about realities (plural), assuming that they are not a single reality. What is defined as "truth", in this sense, is a classification attributed to all values that are definitive in the work being developed; it is an experience status. It does not aim to reveal "the" truth, preferring to rely on empiricism to understand reality. Theories are seen as instruments, not answers, that should be used to understand the world. It does relate to positivism, since it rejects what are considered verbal solutions, useless questions and metaphysical abstractions (James, 1979).

Many theorists from different fields are negatively amazed by how many philosophical discussions make no sense when submitted to a simple test of looking for tangible consequences. Pragmatists turn to facts and to action, based on an empirical basis. They tend to privilege the practical sense of design (Dalsgaard, 2014), but many pragmatic designers are not radically affiliated with its ideas.

In this approach to PSD, to achieve strategic levels in organizations, professionals must be committed to real-life practical applications of Design. To be able to do so, researchers and practitioners need to extrapolate the mere technical approaches to Design (e.g. designing

products that are not connected to the company's strategy or graphic interfaces that are dissociated from a brand's positioning). It reaches its strategic levels by addressing in its projects any relevant variable that might interfere in its results on the market or in society, such as consumer behavior, branding, distribution, communication and, of course, all the traditional design elements, such as packaging, product, etc.

> At its core, design is an interventionist discipline that seeks to bring about change by developing and staging artifacts and environments that alter how we perceive and act in these volatile conditions […] The interventionist and transformative agenda of design resonates with the pragmatist tenet that practice-based action takes precedence over doctrines (Dalsgaard, 2014, p.148).

To work in this complex market environment, pragmatic designers and researchers narrow down all variables that interfere in a project to only a few that are supposed to be the most impactful. This procedure is aimed to privilege in-depth views of projects and/or research, refraining from the seductive attempt of exploring shallowly too many variables and their relationships.

Companies that are considered innovative, such Airbnb, are examples of pragmatic views on design strategy and experience-driven delivery. Airbnb is a North American home rental service and platform that works in most countries in the world. Through technology (website and mobile app), the company provides all booking procedures to consumers. It works in a perspective described by the company as "safety by design" (https://www.airbnb.com/trust), including measures such as background checks to avoid terrorism and risk scoring (all reservations are scored for risk before they are confirmed, using predictive analytics and machine learning to evaluate signals that flagging suspicious activity). By observing the North American social issues with terrorist attacks and designing technological interfaces to deal with it, pragmatic solutions to consumers are delivered by the company.

Organizations that are involved in trading products, services or even product-service-systems are commonly concerned with user experience. To this type of company, often the consumer is the actor who will make them successful or not, by adopting their products or services. Therefore, PSD is concerned with user experience, reason why designing for experiences may be seen as one of its essential parts.

Strategic design has been addressing user experience as part of the designed systems, but its theoretical and methodological approach to human experience is still at an early stage of

development. It has been borrowing tools and methods from emotional design, experience design, among others (Tonetto and Costa, 2011), without specific strategic approaches.

Even though strategic design can be related to sole deliveries, such as designing a product or a service, it is known that a product-system perspective allows better ways of designing to evoke, e.g., a particular experience to the user. E.g., to design for inspiration in education, the project may include aspects of the teaching method, environment, furniture, etc, which evidently allow more ways of stimulating a particular experience (inspiration, in this case), than designing a sole material object.

In other fields, such as industrial engineering, the expression product-service-system is employed to describe an outcome that is not a single artefact, even though there is no notion of system that extrapolates an amount of unities (coherently) tied together. Therefore, it is relevant to reinforce that the discussion of pragmatic product-service-system does not expand to complex relationships of elements that would not be considered as separate units (e.g., Morin, 2011). In this sense, strategic thinking broadens the design focus from material objects to product-service systems.

Pragmatic and strategic perspectives of design in research and practice tend not to focus on artefacts that are dissociated from the company's strategy and/or the market context in a broad sense. In the following chapter, the most important influences to build the concept of PSD that is proposed in this paper are reviewed.

1. INFLUENCES ON PRAGMATIC STRATEGIC DESIGN

There is no chronological relationship that would allow the organization of the following three subsessions. Scientists started to look into the human mind, advancing the knowledge about the ways in which people think and make decisions (2.1). Traditional design, as a mere technical activity, has fallen into pieces (2.2), and so did the old-fashioned approaches to strategic planning that facilitated the emergence of design management and strategic design (2.3).

1.1. Cognitive studies in bounded rationality and metacognition

In the 1950's, the international scientific community has seen a revolution in many fields, such as philosophy, neuroscience, anthropology and psychology (Miller, 2003). The sole focus on observed behavior has failed in explaining mental processes, and what was called "behaviorism" has fallen in decadence.

> As Chomsky remarked, defining psychology as the science of behavior was like defining physics as the science of meter reading. If scientific psychology were to succeed, mentalistic concepts would have to integrate and explain the behavioral data. We were still reluctant to use such terms as "mentalism" to describe what was needed, so we talked about cognition instead. (p.142).

In the 1960's, it became visible that a multidisciplinary field was evolving. Many American universities, such as Harvard and Carnegie-Mellon, have started to use expressions such as cognition and information-processing psychology to describe it. Two of the main influences from the cognitive sciences to Design are described here: the concepts of bounded rationality and metacognition.

First, the concept of "bounded rationality" is explored here. One of the researchers who is an exponent in the investigation on human rationality is Herbert Simon. According to Newell and Simon (1972), "1956 could be taken as the critical year for the development of information processing psychology" (p. 878).

A few years later, Simon (1996, originally published in 1969) has written some influential work to the design field. In "The sciences of the artificial", he brought to Design the expression "bounded rationality". Many researchers seem to have misread his work, suggesting that it treated design problems as structured in essence. Simon, on the other hand may have said that design problems ideally would be structured as much as possible during the design process, but it is a misconception to say that the father of the concept of bounded rationality would suggest that humans are rational. He did not and won a Nobel prize for presenting evidence of exactly the opposite.

Many researchers have evolved this investigation topic. Most of them did not care about updating their findings to make them easier for designers to read, since they are not from the Design field. One of them, Daniel Kahneman, another Nobel Prize winner, have experimentally shown that people are bounded in rationality and that many decisions in uncertain scenarios are led by intuition, which is associative, emotional and not rule-based (Kahneman, 2003). Many decisions in design, as the reader may be familiar with, are made in this type of scenario (Tonetto and Tamminen, 2015). Pragmatists, therefore, are aware of the fact that designers are not totally rational (in the Economics sense) and that intuitive decisions are needed to deal with uncertainty about the future.

Second, another important influence on design that needs to be explored is the concept of metacognition. Flavell (1976, 1979) was the first to introduce this concept in educational and cognitive psychology. Since then, this term has been used to refer to a person's awareness of

thinking and learning, or, simply put, to think about thinking: "For example, I am engaging in metacognition if I notice that I am having more trouble learning A than B; if it strikes me that I should double check C before accepting it as fact" (Flavell, 1976, p. 232).

Simon and most of the cognitive scientists working on design are aware that metacognition allows people to reflect about practice, think about what they are designing, and learn and revisit the design process as many times as needed to achieve an optimal solution. Metacognition in action, in the Design field, is what is defined as metadesign hereafter in this paper.

It is important to highlight that the term metadesign is not employed in a unidirectional level. Many of the uses of this term are divergent and even contradictory (for a review, see Giaccardi, 2005). The interpretation made in this paper relies on its cognitive aspects, focusing on the processes the designer's mind makes.

The understanding and planning of people's actions through metadesign is crucial for strategic designers. More than trying to make a science out of Design, following a normative approach, a descriptive, easy to adapt and fluid way of understanding design processes is needed. According to Cross (2001), Design has a particular way of generating knowledge, defined as "designerly way(s) of knowing". It is an approach distinct from science in a strict sense, involving not only a way of knowing, but also of "thinking and acting" (2001, p. 55). Therefore, there is no design strategy without a designerly thinking, and the understanding of design in a mere technical way has fallen into pieces, as seen in the following subchapter.

1.2. The failure of traditional industrial design

There is a widespread understanding of Design as a chain of systematic activities. Design consolidated its core within the industry for most of the twentieth century, having the industrial product as a focal point. Procedures used to be translated linearly and sequentially, identifying problem and solution, and beginning and end. Initiatives such as the Design Methods Movement emerge from this effort to systematize the design process. A series of conferences that took place between 1963 and 1968 ended up characterizing a type of design interested in products and had the binomial problem-solution as a highlight. It is easy to identify such characteristics in the works of Bruce Archer, Tomas Maldonado and Gui Bonsiepe (Dubberly, 2005), as well as the influence Simon and Poyla had on them (Goldschmidt, 2014). There are some distinctive characteristics of this way of dealing with Design: the design process is clear and organized in stages; starting point, intermediate stages and solution happen in predetermined rhythm; clear parameters, and reduced and

controlled risks guide decisions; the designer is the protagonist of the design process; prescriptive models capable of being replicated indistinctly are desirable.

According to Krippendorff (2006), it is not difficult to identify many products designed according to this approach that failed (see, for example, the author's examination of the Bauhaus product problem or Ulf's HfG). These failures led Design to be concerned not only with products anymore, starting to deal with goods, services and identities (Krippendorff, 2006). In this movement, Design becomes interested in a scheme of relations, which extends from the focus on the technical object to humans, and the relationships between interested actors. Designing without contextual adaption and disconnected from the industry and the society, in a stereotyped and always systematic way, certainly had its price.

When designers deal with a system involving products, goods, services, and identities (to keep up with the Krippendorff exam), they recognize the importance of letting go they authority over the process and being flexible in its processes, engaging in multidisciplinary compositions (Meyer, 2011). It was an era of failures. Not only the modern traditional industrial approach to Design has failed to respond to market issues. To be able to design systems in a strategic way in a changing world, the traditional stereotyped view on strategic planning, which was also fragmented in stages and predetermined, has also failed.

1.3. The failure of traditional strategic planning and the emergence of design management

Strategy is a term imported from the military context and is usually associated with a form of elaborated reasoning to achieve determined aims. The management field adopted the term as a fundamental concept. In this context, the planning of strategies occurs in a course of actions that involve processes and activities, and the management of resources – material or immaterial – to allow companies to achieve their aims.

The discussion about strategy has become a constant in organizations from the 50's, due to the type of thinking developed after the Second World War. Strategy is only seen as relevant if it allows organizations to achieve specific goals (Barnard, 1979). Examples are the growth of General Motors, headed by Alfred Sloan, which overtook Ford Motors in the first half of the 20th Century. Their expansion is explained by the understanding of their own and their opponent's strengths and weaknesses. Their strategy was grounded in this analysis (Sloan Jr., 2001).

Strategy may be seen as a demonstration of the awareness of a company about itself and its future. This concept raises some questions: In which extent strategies are planned and

implemented by professionals? Are they context-dependent? May the organization's actions be different from those which were explicitly planned?

The evolution of organizational strategic thinking can be grouped in two perspectives: prescriptive and descriptive. The focus of the prescriptive path is the process of conception, formulation and implementation of strategies, based on models and tools. In the descriptive path, professionals seek to understand how strategy is, in fact, formulated, revealing that there is a series of unpredicted and uncontrolled components, including organizational culture, cognitive processes, power and negotiation, etc. The premise that strategic planning could be completely structured is in decadence, to say the least (Mintzberg, 2004; Mintzberg et al., 2006).

The belief that it is possible to predict "the" future (singular) with known variables is a fallacy. Less deterministic approaches to strategic planning are emergent, dealing with future scenarios (likely or desired possibilities of "futures") (Porter, 1985). The deterministic planning fails, and the forecasting based on contingencies gains protagonism. Strategists have to deal with dynamic environments and the lack of concrete information about the future, and decide based on their experiences (intuition, according to Kahneman, 2003).

Strategic planning is not a synonym for the design of strategies. Formal procedures do not predict discontinuities. At this moment in time, organizations need new ways to design the future, refraining from merely trying to map the most likely end of a market issue. Probably the first formal approach of Design to organizations was design management, which dealt with strategically placing Design within organization.

Design management has allowed professionals to live the experience of strategic planning, leaving the reactive role of developing solutions to problems that were set by those who were known as strategists. It discusses the strategic role that design has in modern organizations, influenced by analyses of relationships between companies and designers from the 60's, as well as project management and innovation studies from the 70's, 80's and 90's. Nowadays, it analyses the deliberate and gradual positioning of Design in organizations (Borja de Mozota, 2003), having strategic and performance aims (Wolff et al., 2016), whose results can be managed and evaluated (Hertensteinet al., 2001; Hertenstein et al., 2004; Guo, 2010).

Considering design as an important strategic actor to companies, design management expands its focus solely from the placement of design within organizations (Wolff et al.,

2016) to the background issues of this process. It seems obvious that the most adequate and pragmatic way of dealing with Design within organizations is strategic design, using the expression in a very broad sense. There is no reasonable reason to adopt mere technical approaches, when it comes to think strategically. Strategic design allows us to actually design strategies, looking at future scenarios, rather than diagnose market issues and plan how to respond to them.

Design management has been developed in two ways: metrics and performance, and new approaches and disruption. They may be seen as contradictory, but they are not. The second way, the disruptive path, is better aligned with our approach to strategic design, looking at future scenarios to show its value and relevance to strategy. More than only inserting traditional design in companies' predetermined strategies, our approach is to design strategies. Design has become part of the company's own strategy.

2. DISCUSSION: KEY CHARACTERISTICS OF PRAGMATIC STRATEGIC DESIGN

According to the influences described in chapter 2, it is possible to draw eight key characteristics of PSD. They are described in the following subsessions.

2.1. It is committed with real-life practical applications of Design in organizations.

Pragmatism privileges practically-oriented projects. This perspective on strategic design leads to a type of research that is committed with practical results, such as improving user experience at hospitals and assisting companies in differentiating their brands. This does not mean that PSD works only on predetermined problems. It engages in the adoption of strategic research methods, such as action research, that allow professionals to revisit the research field as many times as needed to better understand, characterize and respond to real-life demands.

There is no research without Design, since knowledge must be always applicable. There is no Design without research, since metadesign and feedback movements from and to organizations are an essential part of PSD. For this reason, designer and researcher are words in use as synonyms in this paper.

2.2. Practice-based action takes precedence over doctrines.

Since PSD is committed with delivering practical results to organizations, it would not be reasonable to adopt doctrines. A single reality is not envisioned. The opposite is true: there is a concern with building the best possible future to the organizations. Theories and

contextual and non-contextual observations allow designers to build premises (to avoid the use of the word hypothesis, which is strongly related to statistics) to guide experimentation.

2.3. It extrapolates the mere technical approaches to Design, preferring to design product-service-systems.

PSD does not adopt a view on single products or services; it is most likely concerned with product-service-systems. To be able to achieve organizational expected outcomes, designers commonly need to address many design issues, e.g., products, associated services, communication, as well as several design application fields, e.g., product design, service design, visual design, packaging design. This is one of the reasons why this approach can be described as strategic design, since it is not focused on a particular focus on sole material aspects of a project.

Any discipline that is not committed with this systemic approach is closer to industrial design, as opposed to the proposition of PSD made in this paper. Therefore, PSD is not an application area of Design, but a knowledge field that is applicable to many design contexts. This means that it does not oppose to designing a product; it makes reference to a way in which researchers and practitioners think about the project and a systemic approach to it.

2.4. It operationally defines the variables that will be considered in the design.

The pragmatist heritage of this approach indicates an action path that is focused on defining the most important variables/attributes for the researcher to work on. It is assumed that there is no way of dealing with complex relations of multiple actors, reason why there is an attempt to reduce the project complexity by trying to investigate the most powerful known influences on the design we are working on.

Researchers refrain from exploring shallowly too many variables and their relationships. This does not mean that there is a closed system to observe *per se*. Since the methodological procedures involve testing premises in the research field, the set of variables may be expanded or even reduced during the design/research process, showing the flexibility in dealing with the unities of each system. Whenever designers face data that suggests that they are not reaching results that meet organizational needs, they evaluate the feedback received and redefine variables. At this point, they move away from the straight way of dealing with aprioristic closed systems that are kept this way throughout the project. PSD's strategic view leads designers to open the system whenever it is likely to help them to achieve the desired results.

2.5. It is concerned with the improvement of user experience, since it represents the practical response that is desired by many organizations.

User experience is key to PSD. Since this form of design is committed with real-life practical applications, one of the most powerful measures of results is the response we get from users.

Users are not isolated units in the way PSD looks to the systems designers work on. They are the actors that interact with all designed elements of this system. Therefore, there is no PSD that does not look to strategy all the way: from the organizational strategy itself to its impacts on users.

Please, note that PSD does not have its own theories or methods to design to evoke or prevent particular experiences. Emotional design is one of the theories that assist in dealing with human experience, but it is yet to come the stage in which we have specific approaches in PSD. Although it may seem unnecessary to advance in this way, theories such as emotional design are not committed with strategy, so they do not necessarily respond to what we look for.

2.6. It is multidisciplinary.

Considering that the essence of PSD is not to be focused on a single material aspect of an artifact, but on product-service-systems, the only possible way to work on the huge system of interactions of a project is by collaborating. The systems PSD work on are seen as composed by diverse components, and the same applies to the way disciplines are perceived.

Transdisciplinary interaction across designers seems to be a desired path to the future of PSD, but design-related disciplines have evolved and specialized. This indicates that working with interdisciplinary teams, rather than attempting to go beyond their limits, may be seen as a more viable solution to the extent our approaches have developed. Therefore, besides designers, other professionals, such as architects and engineers, may be needed to interact with the design team or even to be part of it.

2.7. It deals with intuition though metadesign to be able to focus on the future.

Is is a common misconception to assume that pragmatists do not work in an intuitive manner. Two Nobel Prize winners have inspired us to use intuition to deal with uncertainty in our projects: Herbert Simon and Daniel Kahneman.

As Simon (1955, 1956, 1969), Tversky and Kahneman (1974, 1981), Kahneman and Tversky (2002), and Kahneman (2003) have said, we are bounded in rationality and deal with complex problems that force us to make decisions that are based in associative and

experiential backgrounds, defined by the latest as "intuition". This means that we use our previous knowledge and learnt patterns of responses to fill in the informational gaps that design face us with (Tonetto and Tamminen, 2015).

Any innovative design deals with not yet known futures, which means that PSD cannot only deal with concrete reasoning. To envision alternative futures to guide design, professionals need to use intuition and may also explicitly use metacognition to evaluate their practices, learn from them and redirect/adapt the design to fulfill organizational needs. It would not be a designerly approach to disregard metacognition. Only mastering the design process and having a "metaperspective" of the whole picture will allow professionals to have a strategic view and know how to move on the table.

2.8. Design is focused on preferred outcomes, rather than on likely ones.

What moves PSD away from traditional strategic planning is that it does not plan how designers are going to respond <u>to</u> the future and <u>in</u> the future. It is assumes researchers do know what the future will be. Of course, designers try to understand in which direction the future is moving to, but they consider they are the organization's strategy, so that they are capable of designing their way to get somewhere else.

Instead of responding to what used to be known as "design problem", professionals set the problem, creating them. They study strategic ways of making organizations flourish. Many times, this design path is not what is most likely to happen. It might even be what is less likely, but desirable, to happen.

3. CONCLUSION

PSD operates through the **mobilization of organizational resources that are defined throughout the design process**. Strategic design should act in the development of strategies themselves within organizations, refraining from merely responding to predetermined strategies designed by others.

Even though PSD researchers usually have resources, actors and aims defined *a priori* in their research, **strategy shall be fluid** and professionals need to be open to adapt any strategy when they face evidences that indicate alternative paths to achieve organizational goals. The research/design works in cycles, in which designers and organizations give and receive feedback to allow the likely needed adaptation of processes. Metacognition allows designers to achieve **metadesign** levels of thinking and operating, and the dialogue between theory and its applications represents metadesign itself. Therefore, **research through**

action is preferred, since it allows the experimentation with strategies and the development of **guidelines** to designers. Guidelines are not requirements, which means that they are flexible, and all knowledge is context-dependent.

PSD does not necessarily develop **product-service-systems**, but it is likely that sole products or services will not be enough to respond to complex demands from organizations. Products are not (anymore) often decontextualized from associated services and communication, for example. Therefore, **interdisciplinary** work is essential to overcome disciplinary barriers to design systems.

Another strong characteristic of PSD is that we target the **experience** or whoever is in contact with the systems we design (e.g., the users of a product). Improving user experience, emotions and wellbeing is frequently part of organizational aims. There is no PSD that is not committed with experience in a general way.

Since the design of strategies commonly involves innovative processes, designers face a lack of clear information, and it is essential to be able to **deal with intuition**. Intuitive processes, in the cognitive tradition of research, is an adaptive and desirable way of dealing with what Kahneman (2003) referred as uncertain scenarios. It is the only way the human mind can come up with associative ways to respond to unknown issues.

Influences from management sciences, including strategic planning and design management, assisted researchers in understanding how companies may incorporate design. Especially design management allowed Design to be practically inserted within companies, measuring and managing its results (Hertenstein et al., 2001; Hertenstein et al., 2004; Guo, 2010). Considering Design as an important actor within companies, design management expanded its focus, looking beyond its mere insertion in enterprises. It got interested in all background issues, such as design assumptions, the absorption of design knowledge and team maturity (Woff et al, 2016). In this approach, strategic design represents an advance to design as a field. It allows Design to "be" strategic, more than responding strategically to demands raised by others. Designers are not inserted in the strategy; they design it.

It is important to highlight that this paper could be considered an eternal work in progress. As a constantly in change theoretical and methodological view, it is a particular view of a group of researchers that chose to inform the scientific community of their approach to strategic design – PSD. Limitations of this study are numerous, since many approaches may derivate or even contradict the one that is described in this article. Its strengths are

providing a basis for a network of researchers to understand, dialogue and develop strategic design from our point-of-view.

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