Towards a reference framework and characterization of Advanced Design, a design culture for strategic designers

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ABSTRACT

The discipline of design is continually facing challenges related to the complexity and variability of the contexts which give rise to it. Assuming more strategic roles, the designer becomes involved in innovation processes, which act as facilitators for the creation of added value for businesses. The designer develops, therefore, as an anticipator and explorer of new opportunities for progress. In this way, assisted by the tools of Advanced Design, the designer is a key participant in the pre-project stages where the approach to the project is planned and where the meta-concepts that empower specific innovation projects are created. It is, for that reason, vital to understanding the distinctive features of this area of design and the ways in which it can facilitate the professional activity. This article showcases a part of the research carried out by Iñiguez and León (2016) and examines the principal attributes, which characterize Advanced Design, with the aim of serving as a reference framework for the project culture of contemporary strategic designers.

Keywords: Advanced Design, design processes, design cultures.

The references of strategic vision

Over the course of the last few decades, design has acquired a new focus and way of operating. The original concept of the discipline has widened considerably in scope and complexity and become much more deeply intertwined with other disciplinary fields, the practices of which have shifted from one sector to another, joining knowledge and understanding in a kind of "holistic approach" linking three different levels: business strategy, product strategy and product-specific decisions (Khurana and Rosenthal, 1998). The designer therefore not only assumes an executive role in the resolution of problems directly related to the product but also participates in the product strategy and also in prospective company innovations.

This focus integrates all aspects of business and society, as well as reimagining patterns and constructing ideas, which have emotional significance in addition to a functionality characterized by ways of expression distinct from just symbols and words (Brown, 2009). This focus also has an effect on the transversal processes of different disciplines that involve the development of products, which mediate between different company departments, for example creating dialog between the Engineering, and Marketing areas,

which allows for a common vision, one that clarifies the value of the innovation for the company. This role of mediator also involves systems of communication with consumers (Celaschi and Deserti, 2007), and, as a result, design has assumed a position somewhere between consumption and production, but one which draws ever closer to New Product Development (NPD).

In this context of new roles of intervention appears the definition of "Design-Driven Innovation" (Verganti, 2009) a different approximation of intervention from technology-push/marketing-pull or "human-centered" or "User-centered Design" (Norman and Draper, 1986). In "Design-Driven Innovation", design has wider horizons and is once again exploratory, administered by knowledge and guided by innovation, mostly based on the change of meanings of their products and in the activity of design as a central articulator of processes.

The project designer's role has evolved along with the growth in the availability of problem-solving technical tools. This means that the project is not always at the center of design activity and signifies a shift away from a project-based role to a more knowledge-based one (Borja de Mozota, 2006). Both design itself and the role of the designer are more closely linked to processes, are more inclusive

and are more closely tied to research. This is a result of Design Research evolving into a formal component of the design process (Buchanan and Breslin, 2008).

The inherent complexity of the processes of innovation (Bar-Yam, 1997; Tesler and Saffer, 2007; Thakara, 2006; Norman, 2010), the incorporation of a greater quantity of variables and the uncertainty which they cause (above all in the pre-project stages), and the new challenges the industry is facing have all served to push the design industry into more research-based territory. As a result, new applications have appeared for design-related tools in the pre-project context.

With regard to the concept of *Fuzzy Front ends* (FFE), Smith y Reinertsen (1991); Khurana and Rosenthal (1997); Cooper and Kleinschmidt (1986) and Koen *et al.* (2002), all describe this innovation-guiding process, as can be seen in Figure 1.

What stands out in the above-mentioned process is the high degree of uncertainty and risk generated by each one of these actions due to their significant effects on the future of the project. The nature of the design processes in this context are not linear or sequential. Their complexity and the horizontal nature of their focus as well as their variability make them more adaptive; they are frequently experienced in the field of practice and organized opportunistically, sometimes from a bottom-up, sometimes from a top-down perspective (Willemien, 2009). It is within the opportunism that FFE activities can be found, principally centered on processes; both design within processes, and design as a process in itself.

Another important feature of this process is that the designer acts as a facilitator while integrating clients ever more closely in the creation of value, in a process known as co-creation. As can be seen, professional activity is becoming more focused on the designer as "metadesigner", one who constructs multidimensional design space that provides a user-friendly interface, enabling the user to become a co-designer (De Mul, 2011). In this activity, the metadesigner performs a strategic role at precisely the pre-projectual (or meta-projectual) stages, where the meta-concepts which facilitate and push the boundaries of specific innovation projects are seen, as well as giving users a voice in the process and facilitating the participation of other multidisciplinary actors.

As it can be seen, the trajectory of design and its practices has reoriented the definition of strategic roles towards

a more advanced concept, one where design transcends the object and conquers intangible territories. This has been made possible, according to Viladàs (2009), thanks to a specific methodology based on the following: the capacity to function in complex situations, the ability to read indicators and anticipate tendencies, and the facility to visualize concepts and communicate them efficiently while being user-focused and adapting to the restrictions of each project.

The capacity to visualize avenues of innovation associated systemically with all the variables implied in the operating context in which practice is developed, as well as the management of the tools and processes necessary for individual decision-making within businesses, opens new possibilities based on the strategic potential of the design and its capacity to add value to the organization through its processes.

Advanced design approaches

In this strategic role of the designer, Advanced Design appears as a focus, which assists in projectual activity. Its practices have been tested from the point of view of *praxis* since the 1970s, with the first historical reference to it being seen in the foundation of the Olivetti Advanced Design Center in Cupertino in the USA in 1979 (Celi, 2010). Later on it appeared in the automotive industry with the development of *concept cars* and can today be seen in consumer products such as those manufactured by Nokia o Whirlpool, with their research into and development of exploratory and futuristic products. Examples can also be seen outside industry and more closely associated with the world of art, culture or urbanism for example, with highly complex projects and conceptual and futuristic developments. It is theorized that what all these types of practice have in common is their starting point, which despite being a consolidated practice is still not thoroughly documented or researched (Celi, 2010).

The specialized literature, which usually reflects understanding of particular design fields: design management, product design and design methodology or innovations at the FFE is conspicuous by its absence in the field of Advanced Design. This requires the clarification of terms and the definition of roles, and makes research into AD and understanding of how it works particularly important.

Within the definitions of Advanced Design, we can find some peculiarities, which govern understanding of its
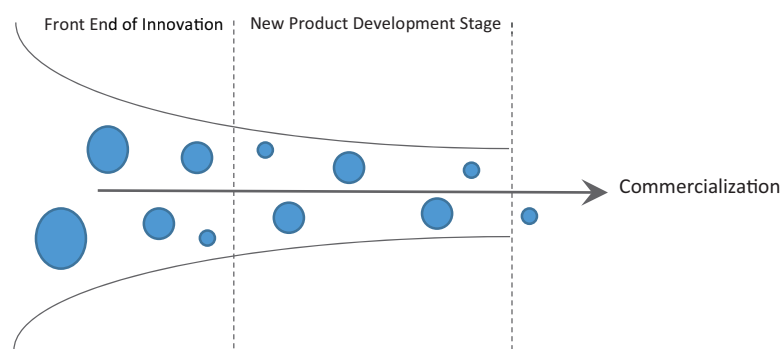

Figure 1. Adapted from Fuzzy-Front End of Innovation (Koen *et al.*, 2002).

strategic direction. The following are some observations by those who strive to capture the foci of AD:

(1) Borja de Mozota (2005) established that, in reference to strategic scale, AD has the following three value levels:
  (a) Design as customer/brand value;
  (b) Design as a performance and innovation value;
  (c) Design as strategic value.

Starting from the level "design as strategic value", the primary feature of Advanced Design can be characterized as that which develops a vision equivalent to prospective design (that oriented towards the future), the exercise of which is concerned with generating long-term innovation and the creating the circumstances necessary for this to happen, thereby adding value at the moment these design perspectives are incorporated into the strategic vision of a business.

(2) A second characteristic is orientation towards the future. Some authors indicate that new instruments and operating methods prioritize the definition of new future scenarios, and suggest outlines guided by the project and not necessarily by the product. The nature of the project, not only in terms of length but also in terms of its aims and objectives, goes beyond the traditional objectives of a design project, which is usually objective-product in nature, and attempts to generate methods of innovation, which are wider in scope and offer greater possibilities.

(3) This anticipatory practice gives rise to a third characteristic: continual innovation, understood as innovation, which takes place on a continuum over the long-term and is not determined by a particular end product but rather by the possibility of generating successive possibilities. It is the visionary side of design, driven more by possibilities and less by constraints (Celaschi *et al.*, 2011).

(4) A fourth characteristic is the management of complexity: as has been mentioned, in the new roles of design the multiplicity of variables within the design project are increased exponentially during the pre-projectual (or FFE) stages. Advanced Design manages complexity through dialog with the world of research, for example the development of new products (Iñiguez *et al*., 2014), and is situated in the back-and-forth of Research and Development (R&D). It acts as a link between the content of the research, which necessarily develops over time and in its own way, and production, characterized by the agile and rapid reaction of both industry and market (Di Bartolo, 2014). Through managing the various elements in this way Advanced Design begins to function in a manner much more oriented towards systemic processes, recombining instruments and competencies which go further than the more familiar repertoire of design tools and which transcend the discipline and act in a manner which is much more horizontal than other disciplines and fields of knowledge.

Linked to previously mentioned aspects such as the peculiarities which establish the strategic direction of Advanced Design, it could be that one of the most complete definitions of the discipline is that of Celi (2010) who affirmed that: Advanced Design is a practice that imagines future perspectives by envisioning future products and processes. It mainly deals with extensive projects – extended in time, space, uncertainty, and complexity. As a branch of design, it covers primarily the front end of innovation and look for solutions in complex innovation processes using design-related tools and practices.

Strategic vision: Admission to and exits from ADD

The strategic role of the designer within the organization is determined in large part by the management of information and the capacity to generate understanding and develop design competencies within the company. Within both process and practice, it is important to consider the development of AD design projects.

One of the references on a global level in terms of AD activity is Italy, where in can be observed in three distinct but interrelated fields of operation: large companies, design agencies and design services, including both specialists and those working with university research centers.

An example from the large-company sector could be the Fiat group, which has been operating Advanced Design departments developing future visions of mobility for several decades. An example of a specialized design agency would be Giulio Ceppi's Total Tool, Carmelo DiBartolo's Design Innovation or Gino Finizio's Design Managment, all of which have a long tradition of Advanced Design projects. An example of a university working in this field would be Milan Polytechnic, which has set up an Advanced Design research group within its INDACO department with the specific aim of studying this activity (Iñiguez and León, 2016).

Another important aspect to consider is the development of AD projects in methodological terms. With reference to this, the research carried out by Iñiguez and León (2016) revealed that the diversity of responses generated by interviews with experts in the field signified an extremely broad perspective in terms of the development of an AD project. The enquiry revealed that the initial planning of AD projects share many similarities, and this is reflected in the adjectives, which describe the results.

The departure point of ADD or, in other words, the initial information upon which a project is based, is generally related to the following three themes:

(1) *Strategic context:* Information about the company, its capacity, its market position and its values. Project actors, not just those carrying out the project but those businesses and agents included in the entire value chain and the society related to the theme. This area also covers macro systems such as economy, culture and the technological tendencies related to the project.

(2) *Future vision:* Prospective information, whether or not it comes from previous studies (for example blue-sky research or previous AD projects such

as Continuous Innovation), and is information which evokes scenes and trends. Also of importance is the timeline of the project, and whether the totality of its development is visualized at the start: this is commonly expressed as a date, for example 2025.

(3) *Advanced brief:* The definition of the approach, i.e., the frame of reference in which the pre-figuration of a complex problem is situated and which takes into account the multifactorial and multidisciplinary information surrounding it. This theme will always be at the vanguard of innovation (FFE), and can be viewed more as an opportunity for innovation than a list of precise requirements.

In the plan of action outlined above the finish point or end, result produces a product, which can be described in the following way:

(1) *Innovation paths:* this information is more closely related to the level of business planning, as it generates strategic maps for potential innovation, advanced projects which have the capacity for further development or which can be used as a starting-point for the generation of variants, a kind of meta-projectual *dossier* which allows other teams to take up the original idea and produce further possibilities, whether they be new AD or NPD projects. Some experts refer to these projects as "semi-complete" as they enable other, subsequent projects to be undertaken more efficiently.

(2) *Scenarios - visions:* qualitative information about possible futures, typically expressed visually as a descriptive representation of the product-service-systems, which can be developed in the future, and the contexts related to them. This end-product is probably the most obvious manifestation of design-research linked to the project.

(3) *Advanced prototypes:* the representation, both graphic and physical (prototype), which shows the potential of the innovation to the company, and the aesthetic and technological possibilities of a future product. An example would be "Dream Products" or "Concept Cars" in the case of the automotive industry.

As can be seen in Figure 2, a clear end-result of the practice of AD is the spontaneous generation of new processes or the constant redefinition of the process of project activity, as well as the generation of new competencies within the discipline.
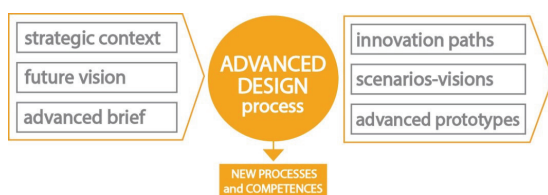

Figure 2. Project Culture of Advanced Design (Iñiguez and León, 2016).

This being the case, the process of AD (prior to the final result), generates information relating to the methods and procedures required for generating innovation, as well as bringing new methodological tools to the process of design.

The exercise of AD prepares the business for a more innovative culture, as those actors involved are deeply involved in the practice, developing specialist abilities at an individual level as well as collectively, promoting an important organizational change which orients the business towards a strategic vision with new horizons of innovation.

These processes are key, and have a fundamental value in the development of the discipline and the roles of the designer in their position within the business or organization. The generation of new competencies is in itself an ever-changing process, but changes are also seen in the way in which organizations operate and in how, prompted by design, innovation is understood, anticipated and strategized through the lens of systemic thinking.

Conclusions

This article is a framework designed to orient the reader in terms of the peculiarities of Advanced Design, and has the objective of prompting reflection about the evolution of the discipline in a contemporary and about the future context for the designer and their role in society.

In this sense, it is worth mentioning that, according to its strategic potential for businesses, Advanced Design can perform the function of enabling innovation, a characteristic which is somewhat lacking in NPD and which suggests that, in its essence, AD is much more closely linked to continual innovation than a traditional project, which has a clearly marked beginning and end.

It is therefore suggested that a "diversified project" has a greater possibility for innovation as each stage has the capacity to produce tangible results, which can be exploited for their innovation potential for new projects.

The suggestion that ADD develops innovation skills in both participating actors and organizations gives a frame of reference for future research. It is believed that this will further understanding of the nature of the activity as well as give a possible measure-identifier of its value to both business and stakeholders, as well as changing organizational culture.

In reality, the designer evolves and grows in an ever-changing context in which the limits of disciplines and the types of problems requiring resolution are continually changing. The strategic vision of the design professional feeds into the systemic relationship of these variables and their ever-changing context, and this allows for the identification of connections which suggest methods of innovation, allows the generation of action plans, permits scenarios to be outlined and proposes advanced projects which give value to the business and show the way to progress.

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