

Design, meanings and radical innovation: A meta-model and a research agenda.

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Running Title: *Design, Meanings and Radical Innovation*

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Abstract

Recent studies on design management have helped us to better comprehend how companies can apply design to get closer to users and better understand their needs; an approach usually referred to as “user centered design”. Yet, analysis of design-intensive manufacturers such as Alessi, Artemide and other leading Italian firms, show that their innovation process hardly starts from a close observation of user needs and requirements. Rather, they follow a different strategy that we call “design driven innovation”. This strategy aims at radically change the emotional and symbolic content of products, i.e. their meanings and languages, through a deep understanding of broader changes in society, culture and technology. Rather than being pulled by user requirements, design driven innovation is pushed by a firm’s vision about possible new product meanings and languages that could diffuse in society.

Design driven innovation, that plays such a crucial role in the innovation strategy of design intensive firms, has still remained largely unexplored. This article aims at providing a possible direction to fill this empty spot in innovation management literature.

In particular, first it proposes a meta-model for investigation of design driven innovation. In this meta-model a manufacturer’s ability to understand, anticipate and influence emergence of new product meanings is built by leveraging on external interpreters (designers, firms in other industries, suppliers, schools, artists, the media, etc...) who share its same problem: to understand the evolution of socio-cultural models, and propose new visions and meanings. Managing design driven innovation therefore implies to manage the interaction with these interpreters, in order to access, share and internalize knowledge on product languages and influence shifts in socio-cultural models.

Second, the article proposes a possible direction to scientifically investigate the management of this networked and collective research process. In particular we show that the process of creating breakthrough innovations of meanings partially mirrors the process of creating breakthrough technological innovations. Studies of design driven innovation may therefore benefit significantly from the existing body of theories in the field of technology management. The analysis of the analogies between these two types of radical innovations (of meanings and technologies) allow to set a research agenda for exploration of design driven innovation, a relevant as well as underinvestigated phenomenon.

Introduction

Design has recently gained much attention among practitioners and scholars. Firms are increasingly investing in design and involving design firms in their innovation processes (Nussbaum, 2005). Academic journals are publishing articles that explore the contribution of design to product development and business performance (Gemser and Leenders 2001, Platt et al. 2001, Hertenstein et al. 2005). JPIM, for example, has recently devoted two special issues to the relationship between design and product innovation (and in particular to the interactions between marketing and design) (JPIM 2005a and 2005b). These seminal contributions have started to give a more grounded theoretical basis to the field of design management, which was almost completely uncovered by scientific research. Yet, this is only a starting point of a long research path whose major puzzles still remain to be solved.

Significant efforts in this recent literature have been concentrated into investigating a specific approach to design, usually referred to as “*user-centered design*” (see for example Vredenburg, Isensee and Righi 2002, Chayutsahakij and Poggenpohl 2002, Veryzer and Borja de Mozota 2005). This approach, in the spotlight thanks to the successes of major design firms such as IDEO (Kelley 2001) or Continuum (Lojacono and Zaccai 2004), implies that product development should start

from a deep analysis of user needs. Its assumption is that a firm may infer unique insights to inform product innovation by asking users about their needs or, more effectively, by observing them as they use existing products and by tracking their behavior in consumption processes. The growth of interest on applied ethnographic research – i.e. the practice of observing users in the context of use – is a signal and a direct consequence of this approach. Investigation of user-centered design and analysis of its success cases has helped to surpass the classic and common interpretation of design as style, i.e. as “something to make products look better”, that comes from the unspoken intuition of an individual designer. These studies provide a deeper and more valuable interpretation of design as an organizational process, a process to get closer to users and their actual needs. And indeed, models of user-centered design processes, with proper steps and tools, have been proposed (Patnaik and Becker 1999, Khumar and Whitney 2003). Models that effectively combine on the one hand methods to better understand customer needs (such as ethnographic research and its variations, see for example Rosenthal and Capper 2006), and on the other hand guidelines on how to improve creative skills (Sutton 2001).

No one questions the importance of user-centered design. Yet, this is only one piece of the puzzle. There are indeed firms that have effectively developed a different approach to leverage on design, an approach that does not fit the user-centered model, and to a large extent is orthogonal to it. This approach, that we call “*design driven innovation*”, is practiced at its most sophisticated and advanced level by successful Italian manufacturers, such as Alessi, Artemide, and Kartell, and allows them to be worldwide leaders in their industry, notwithstanding their small size and limited resources. The innovation process of these Italian companies in furniture, kitchenware, lighting, small appliance industries (as well as other worldwide leaders in different industries such as Apple or Bang & Olufsen), is definitely not user centered. Rather they have developed superior capability to *propose* innovations that radically redefine what a product means for a customer. For them, design driven innovation is the radical innovation of a product’s meaning. An (extreme) example is

the well-known Alessi product line called “family follows fiction”. In 1991 Alessi created playful, colorful and metaphoric kitchenware, with corkscrews shaped like dancing women or parrots and orange squeezers shaped like Chinese mandarins. Although today this type of symbolic objects are quite imitated, before the ’90s no one could ever thought that people would love to have “dancing” corkscrews. This was a breakthrough change in what kitchenware meant for people: from simple kitchen tools to “transitional objects”, i.e. objects of affections that talk directly to the child that is still living inside each adult¹.

Design driven innovation doesn’t start from user’s insights. People definitely didn’t ask for Chinese-like orange squeezers before 1991. But they loved Alessi’s products after they saw them. Indeed, customers hardly help in anticipating possible radical changes in product meanings. The socio-cultural context in which they are currently immersed make them inclined to interpretations that are in line with what is happening today. Radical changes in meanings instead ask for radical changes in socio-cultural models, and this is something that might be understood (and affected) only by looking at long-term phenomena with a broader perspective. Design driven innovation is therefore *pushed* by a firm’s vision about possible breakthrough meanings and product languages that could emerge in the future. As this vision cannot be developed solely by looking at current user behaviors, the process of these firms has few in common with user-centered approaches.

Purpose of the article

We miss a theory to explain why and how leading firms that have brought design at the heart of their business model, such as Alessi, Artemide, Apple or Bang & Olufsen, are so successful *without being user-centered*. The strong focus of recent literature on user-centered design has left a major empty spot in theory of product innovation management: we miss the capability to understand how breakthrough innovations driven by design are created. And this is a relevant matter, as

breakthrough innovations of meanings are usually associated not only to higher profits on product sales, but also to stronger brand value, as the cases of the firms cited above pose us clearly.

One of the reasons explaining why design-driven innovation has largely remained unexplored is that its processes are hard to detect when one applies the typical methods of scientific investigation in product development, such as analyses of phases, organizational structures or problem solving tools (Brown and Eisenhard 1995, Shane and Ulrich 2004). Unlike user-centered processes, design driven innovation is hardly based on formal roles and methods as ethnographic research. We therefore need new lenses to activate a stream of studies on this relevant as well as unsolved matter, and improve our capability to understand how breakthrough innovation led by design occurs.

The purpose of this article is to suggest a research strategy for investigating design driven innovation. Starting from the analysis of successful Italian manufacturers, the article proposes a meta-model in which design driven innovation is the result of a *networked research* process, where *knowledge* on languages and meanings is shared among firms and external interpreters. This meta-model allows to highlight analogies between design-driven processes (that lead to breakthrough innovations of meanings) and technology push processes (that lead to breakthrough innovations of technologies). In other words, design driven innovation partially mirrors networked research processes on technologies, with the major difference that the latter deal with technological knowledge instead that with knowledge on languages and meanings.

Hence, after having described the similarities among the two processes (design driven and technology push innovation), the article sets a research agenda by showing how the investigation of design driven innovation may benefit from the application of theories already developed for the investigation of technology management (if properly adapted).

Summarizing, the purpose of the article is:

- to propose a meta-model that explains the basic mechanisms underpinning the management of design driven innovation (that is the radical innovation of product meanings)

- to discuss, thanks to this meta-model, analogies between design driven innovation and existing theories on radical innovation of technologies.
- to show how theories on technology management (for which there is a significant and consolidated body of knowledge) can therefore be leveraged to investigate the management of radical innovation of meanings.

The aim of this article therefore is not to provide a final answer to the puzzle of design driven innovation (as it presents a *meta*-model), but rather to propose new lenses to activate a stream of research on this phenomenon for which scholars hardly have a theory. By introducing a meta-model, the article gives a direction that allows us not to start from scratch. In particular, its link with theory on management of (technological) innovation allows to leverage on decades of research, with its theories and empirical methodologies.

Although this article is theoretical in nature, its insights are significantly based on empirical analysis. We have been involved in the past 10 years in in-depth investigation of design driven practices in several firms in different industries, with a special focus on Italian manufacturers, i.e. those manufacturers that push radical innovation of meanings at its extreme, with significant and world-wide acclaimed success.

The most significant contribution comes from our participation to the research project “Sistema Design Italia” (Italian Design System). This 1,5 million € project, funded by the Italian Ministry of University and Research and coordinated by Politecnico di Milano, involved 17 research teams in Italy, and developed 74 case studies of successful product innovations in several different industries. It was awarded the “Compasso d’oro 2001”, the most prestigious design award in Italy. Our contribution in the project has been to provide methodology and interpretation on design management practices. After the project was over, we further enriched our understanding of design

driven innovation by investigating other cases in other countries (including France, Denmark, Germany, The Netherlands, and the USA).

Sistema Design Italia was the first ever research study on *management* practices in Italian Design. Many studies had already illustrated the peculiar achievements of Italian Design (especially in industries such as furniture, lighting, kitchenware, appliances, etc.). However, those studies mainly focused on Italian *designs* (e.g. on those products that appear in the major museums of modern arts worldwide) or Italian *designers*. There were also some *macro-economic* investigations that tried to explain the success of Italian Design in the light of contextual factors, such as: a strong tradition in arts and crafts (MOMA 1972); a wealth of young architects in the '50s and '60s that, in face of a lack of policies for large infrastructural projects, dedicated their intellectual energies to products instead of buildings (Branzi 1999); an industrial basis consisting of small and flexible enterprises (the industrial districts; Piore and Sabel (1984)); an advanced culture in consuming products with significant symbolic and visual content, which makes local customers demanding and the local market highly stimulating for design-driven innovation (Gelant, 1994). All these theories indeed partially contribute to explain the success of Italian design. Yet, this success has also a significant *managerial* rationale. Indeed, one could notice that most Italian designs has not been created by Italian designers but from foreign designers who work for Italian firms. There is a special capability of Italian *manufacturers* of attracting talented designers from all over the world, as testified by some of them (Verganti, 2006):

“Northern Italy, is the centre of the design world. Not just because of the design that comes from Italy, but, above all, because of its manufacturing culture; there is no other place in the world where you can find such a vast array of manufacturers who know the value of design.”

Ron Arad, Israeli architect and designer

“In Italy you can find entrepreneurs who stimulate designers from all over the world to work for them”

Karim Rashid, Egyptian designer

“In Italy, when a project is presented to Claudio Luti of Kartell, to Enrico Astori of Driade, to Piero Gandini of Flos, to Umberto Cassina of Cassina, it is a real pleasure. They love the project, they love it with a passion. When a prototype is taken to Alberto Alessi he thinks it is Christmas, it is a splendid gift”.

Philippe Starck, French architect.

These examples suggest that in order to find explanations for the success of Italian design one should also seek into the *management* practices of manufacturers. Italian manufacturers are therefore an interesting and unique empirical ground to investigate the management of design driven innovation.

The article is structured as follows. First, it briefly introduces a framework for interpreting the nature of design driven innovation and its positioning in the map of innovation strategies of firms. Then starting from the analysis of successful Italian manufacturers, it proposes a meta-model to understand how design driven innovation occurs and may be managed. Finally, on the basis of this meta-model we show analogies with the process of creating breakthrough technological innovation and how the existing body of theories in this field can support investigation of radical innovations of meanings.

Design and innovation strategies

One of the reasons that make scientific investigation of design a hard challenge for scholars of innovation management is that the definition of “design” is fluid and slippery. Although there are several interpretations of design (for a comprehensive analysis see Love 2000), one common thread of these definitions is that they tend to be as broad as possible. Apart from Simon’s general definition (“Design is the process by which we [devise] courses of action aimed at changing existing situations into preferred ones” - Simon, 1982, see also Boland 2004), this tendency is

common also in definitions more targeted to *product* design, starting from that proposed in 1961 by Thomas Maldonado for the International Council of Societies of Industrial Design, where design is seen as the process that coordinates all factors contributing to a product, from its consumption (functional, symbolic and cultural factors) to its production and distribution (Maldonado 1991). A consequence of this attempt to make the concept general, is that it also becomes generic, so that one can hardly distinguish its peculiarity with other fields of investigation, which, as underlined by Maldonado himself, slows down scientific progress in the field (Maldonado 2000). Indeed interpretations of design often tend to be very close to “product development” (albeit with a more user centered focus, as supported by the studies on user-centered design cited above; see also Walsh 1996), and sometimes its interpretations are close to “market research”, or “creativity”, and even “branding” (DMJ 1998). The consequence is that many people, when asked to really think about the peculiarity of design, and to think about what really makes design different from other fields such as engineering, they think about the product form, which is spelled “aesthetic and style”.

It is not our purpose here to enter into this debate, that is authoritatively developed by design scholars. However, we need a precise and clear-cutting definition that would allow us to create a connection between design and other existing theories of innovation management. And as we look for differences, our choice has been to adopt a definition that is somewhat narrower than what usually seen in management literature, but that actually highlights the peculiarity of design compared to other innovation fields. Following the approach of many design theorists, our approach is that design deals with the *meanings* that people give to products, and with the messages and product *languages* that one can devise to convey that meaning. In other words we adopt the definition proposed by Klaus Krippendorff on *Design Issues* in 1989 (Krippendorff 1989):

“The etymology of design goes back to the latin *de + signare* and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users or gods. Based on this original meaning, one could say: *design is making sense (of things)*”,

which reflects the archaic definition of the word “design” reported in dictionaries, where design means “to indicate with a distinctive mark, sign or name” (Merriam-Webster’s Collegiate Dictionary, 1993). The product style (considered as its mere aesthetic appearance) is but one of many ways a product may bring messages to the user. Apart from styling, what matters to the user, in addition to the functionality of a product, is its emotional and symbolic value, i.e. its meaning. If functionality aims at satisfying the utilitarian needs of the customer, the product meaning tickle her/his affective and socio-cultural needs. It proposes to users a system of values, a personality and identity, that may easily go beyond style. Designers give meaning to products by using a specific design *language*, that is the set of signs, symbols and icons (of which style is just an instance) that deliver the message.

The semantic dimension of design has been actually recognized and underlined also by several design scholars and theorists (Heskett 1990, Margolin and Buchanen, 1995, Cooper and Press, 1995, Petrowski 1996, Karjalainen, 2003. Friedman, 2003, Lloyd and Snelders, 2003, Bayazit 2004, Norman, 2004, Redstrom 2005). Research in marketing, consumer behavior and anthropology of consumption has also demonstrated that the affective/emotional and symbolic/socio-cultural dimension of consumption is as important as the utilitarian perspective of classic economic models, even for industrial clients (Douglas and Isher-wood, 1980; Csikszentmihalyi and Rochberg-Halton 1981; Fournier, 1991; Sheth et al. 1991; Kleine et al., 1993; Mano and Oliver, 1993; Brown, 1995; Du Gay 1997; Holt, 1997 and 2003; Bhat and Reddy, 1998; Schmitt 1999; Pham et al., 2001; Oppenheimer, 2005; Shu-pei, 2005).

The above definition allows us to link more precisely design with other theories of innovation (Garcia and Calantone, 2002), and to better point out its peculiar nature. Consider in particular the diagram in Figure 1. Building on the above discussion we may say that innovation may concern a product’s functional utility, its meaning or both. And alike functional innovation may imply an incremental or radical improvement of technical performance, also innovation of the semantic

dimension may be more or less radical. In particular, innovation of meanings is *incremental* when a product adopts a design language and delivers a message that is in line with the current evolution of socio-cultural models. Users would probably perceive this product as “fashionable” and maybe stylish as it conforms to existing definitions of beauty, i.e. with a style that leverages on accepted languages. However, innovation of meanings may also be *radical*, which happens when a product has a language and delivers a message that implies a significant reinterpretation of meanings.

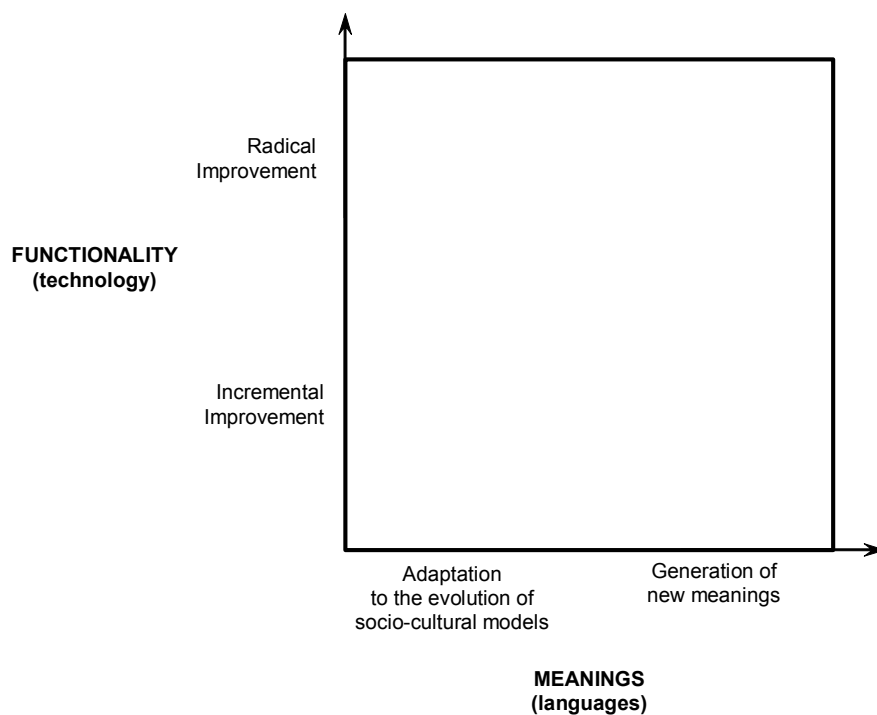


Figure 1. The dimensions of innovation (source: Verganti 2008).

For example, the Swatch, launched first in 1983 was a radical innovation of what a watch previously meant to people. As watches were considered to be jewels in the ‘50s and in the ‘60s, and moved to be considered time instruments in the ‘70s (with the advent of the Taiwanese quartz watch industry), the Swatch radically overturned watch’s meanings into that of “fashion accessories”. Easy to be said ... after they conceived it. But before them, no one thought that watches could ever achieve that meaning (Glasmeyer 1991). The Swatch’s design language, with its

intensive use of plastic, colorful style and low price, helped to convey this new meaning. Nowadays Swatch launches into the market a couple of new collections every year. Each collection consists of style and graphic changes that simply adapt its original meaning to evolutions in socio-cultural trends. Every Swatch collection may therefore be interpreted as an incremental innovation of meanings.

Other well-known examples of radical innovations of meanings are the previously quoted Alessi's Family Follows Fiction products (that turned kitchenware from being simply functional into symbolic objects of irony and affection), or Bang & Olufsen's Beosound 4000 stereo released in 1972, which transformed music players from electronic devices into pieces of furniture (an overturn of meanings that was so radical that not even GE grasped it when Jacob Jensen presented them its first prototype before moving to Bang & Olufsen (Jensen 2005)) or the Apple I-Pod, whose success, largely acknowledged and debated, is not simply due to its stylish form (indeed, before the I-Pod, there were already several other competing MP3 players with a much more stylish language in line with the dominant design language at that time, i.e. the language of the Sony walkman). The I-pod instead has proposed a radical new language and also, and above all, a radical new meaning, implying a new experience limited not simply to listening music, but also to accessing music on the web through the I-tune website, financially supporting the music industry, organizing and accessing songs through novel interfaces, etc..

The area in the right hand side of Figure 1, i.e. where novelty of meaning and design language is radical, is what we call *Design driven innovation*.

Note that design driven innovation sometimes is not immediate. It takes time to diffuse and achieve acclaimed success. Users indeed need to understand the radically new language and message, find new connections to their socio-cultural context, explore new symbolic values and patterns of interaction with the product. In other words, similarly to radical technological innovations, that ask also for profound changes in the technological regimes (Latour 1987, Callon 1991, Bijker and Law 1994, Geels 2004), radical innovations of meaning ask for profound changes in the *socio-cultural*

regimes. We are not talking of “fashionable” or stylish products here, but rather of products that may contribute to the definition of new aesthetic standards, maybe something that could become an icon in the future, definitely something that plays a major role in changing socio-cultural models. In other words design driven innovation may be considered as a manifestation of a “re-constructionist” (Kim and Mauborgne 2004 and 2005) or “social-constructionist” (Prahalad and Ramaswamy, 2000) view of the market, where the market is not “given” *a priori* (such as in the structural perspective, e.g. in Porter 1980) but is the result of an interaction between consumers and firms: needs (i.e., not only utilitarian needs but also symbolic end emotional meanings), are therefore co-created. Design driven innovation is not an answer to, but a dialogue with and a modification of the market.

Successful Italian manufacturers in design-intensive industries have demonstrated unique capabilities to master radical innovation of meanings. Their innovation portfolio consists of several incremental projects coupled with a few strategic (and often successful) attempts to introduce breakthrough changes of product meanings. These breakthrough changes serve the purpose of exploring new routes, satisfying latent desires and aspirations, moving the frontier of design languages, setting new standards of interpretation, and eventually strengthening the brand value. Italian manufacturers therefore provide an interesting investigation ground to understand how design driven innovation may occur.

Looking closely at these firms, we may easily discover that they hardly apply ethnographic and user-centered methodologies and tools in their innovation process. Rather, when asked about how their firms investigate users needs, entrepreneurs of leading design-driven companies have a different patterns of answers (Verganti 2008):

“Market? What Market? We do not look at market needs. We make *proposals* to people”

Ernesto Gismondi, Chairman of Artemide.

“Working within the metaproject transcends the creation of an object purely to satisfy a function and necessity. Each object represents a tendency, a *proposal* and an indication of progress which has a more cultural resonance”

Alberto Alessi, CEO Alessi.

A similar vision is shared by firms in other industries and countries following a similar strategy (Verganti 2008):

“The only time we did market research was with Beogram 4000 (in 1972). Marketing people said it would sold 15 units in Denmark and 50 in the world. It turned out of being one of our most successful products”

Paul Ulrik Skifter, CFO Bang & Olufsen

These managers are telling us that design driven innovation doesn't start from users' insights. And indeed no one would seriously imagine that a user would ever explicitly ask for a dancing anthropomorphic corkscrew. Indeed, customers hardly help in understanding possible radical changes in product meanings. They are immersed in today's socio-cultural context, which shape their interpretations towards current meanings (Gero and Kannengiesse, 2004). Radical changes in meanings instead imply radical changes in socio-cultural regimes, the directions and chances of which might be understood only by looking at long-term phenomena with a broader perspective. Even more interesting, these managers are telling us that their design driven innovations are not answers to user needs, but *proposals*. They explicitly recognize their action as possibly driving change in socio-cultural regimes. Design driven innovation is therefore a *pushing* innovation activity, a proposal of possible breakthrough meanings and product languages with a high chance of diffusion in future society.

Tracing back design driven innovation to theories of innovation management, we may actually acknowledge that a similar perspective is shared by scholars of technology management. There has

been an intense debate in the '70s about the direction of innovation processes (technology push versus market pull), culminated with the milestone contribution of Giovanni Dosi (Dosi 1982) suggesting that any innovation implies understanding of both technologies and markets, and that however changes in technological paradigms (i.e. radical technological innovations) are mainly technology push, whereas incremental innovations within existing technological paradigms are mainly market pull. An approach shared also by more recent research on the relationship between disruptive innovations and user needs (Christensen and Rosenbloom, 1995; Christensen and Bower, 1996; Christensen, 1997; Dahlin and Behrens, 2005). Reading our previous analysis in the light of this realm of investigations, we recognize how design driven innovation is closer to technology-push rather than user-centered innovation. This is the first promising foundation for the purpose of this article, that is suggesting the adoption and adaptation of theories on technology management to investigate design driven innovation.

These considerations are mapped in our diagram on the dimensions of innovation, highlighting the major areas of action of the three modes of innovation:

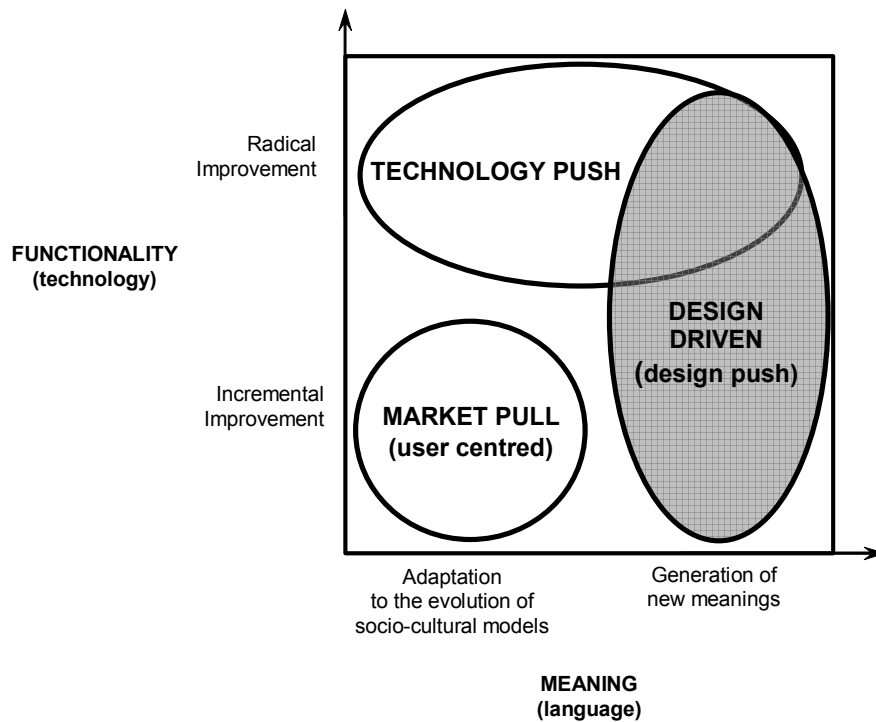


Figure 2. Innovation Strategies (source: Verganti 2008)

- *design driven innovation*, where innovation starts from the comprehension of subtle and unspoken dynamics in socio-cultural models and results in proposing radically new meanings and languages that often implies a change in socio-cultural regimes;
- *market-pull innovation*, where innovation starts from the analysis of user needs, and subsequently searches for the technologies and languages that can actually satisfy them. We include user-centered innovation as a declination of market-pull innovation, as they both start from users to directly or indirectly identify directions for innovation. Although the user centered approach is more advanced and sophisticated as its methodologies allow to better understand why and how people give meaning to existing things, which can lead to more innovative concepts compared to traditional market pull processes, it still operates within existing socio-cultural regimes;
- *technology push innovation*, that is the result of dynamics of technological research. The overlap between technology push and design driven innovation in the upper left corner of

the diagram highlights that breakthrough technological changes are often associated by radical changes in product meanings, i.e. that shifts in technological paradigms are often coupled by shifts in socio-cultural regimes (see Geels 2004 for a very insightful analysis). For example, the introduction of quartz watches in the '70s was both a breakthrough change in technologies (the introduction of semiconductors) and in meanings (watches moved from being jewels to being instruments – some even had a small calculator as an additional feature!). And viceversa, radical innovations of meanings are often prompted by the availability or exploration of new technologies.

As already underlined by the debate on technology push vs market pull innovation, we are not claiming here that one of the above modes of innovation is unaware of the others. As successful technology push innovation requires a deep understanding of market dynamics, also design driven innovation implies analyzing user needs, observing them, and also exploring new technologies. There is a bit of each in any type of successful project. What is different however is the driver, the starting point, as the above sentences of Gismondi, Alessi, and Skifter clearly point out.

The meta-model: Design Driven Innovation as a networked research process

Having defined design driven innovation and identified its specificities compared to other innovation strategies, we may now build a meta-model to better understand how this type of innovation can be successfully managed. And here our perspective is totally *managerial*. Our intention here is not to interpret how meanings change in society, or how designers can creatively grasp those changes and incorporate them into their designs. Here we are concerned with how

firms, and in particular their managers, can implement a process to successfully realize design driven innovations.

To generate this meta-model we start again from our investigation of Italian manufacturers (Verganti 2003 and 2006). Indeed, the radical innovations of meanings “proposed” by Italian manufacturers are not dreams without a foundation, nor they are simply the results of a sudden sparkle of creativity of clever designers. We are talking of great and repeated business successes and of leading firms in the global arena, notwithstanding they are very small in size. How do these companies manage to make radically innovative proposals that are also profitable? How do they create breakthrough messages, that eventually emerge as those messages that (some) users were implicitly looking for?

In order to manage design driven innovation, Italian manufacturers have developed a significant capability to understand, anticipate, propose and influence the emergence of new product meanings. The process through which these manufacturers develop knowledge about possible future socio-cultural evolutions and formulate new product meanings is hard to track. Indeed knowledge about the subtle and unexpressed dynamics of socio-cultural models is *tacit*, is not codified in books or in sociological scenario of the future (which usually describe *extrapolations* of current phenomena, while design driven innovation assumes a *modification* of the scenario by mean of the firm’s proposal). Further, this knowledge is *distributed*. The shaping of socio-cultural models and their impact on the interpretation of product languages depends on millions of unpredictable interactions between users, firms, designers, products, communication media, cultural centers, schools, artists, etc... as studies on production of culture have shown (see for example Peterson and Anand, 2004). Italian manufacturers have recognized that their firms are immersed into this distributed network of actors that both explore future meanings and influence, with their actions, the creation of new cultural models (see Figure 3). And these manufacturers have recognized that most of these actors

share their same problem: to understand the evolution of socio-cultural models, and propose new visions and meanings.

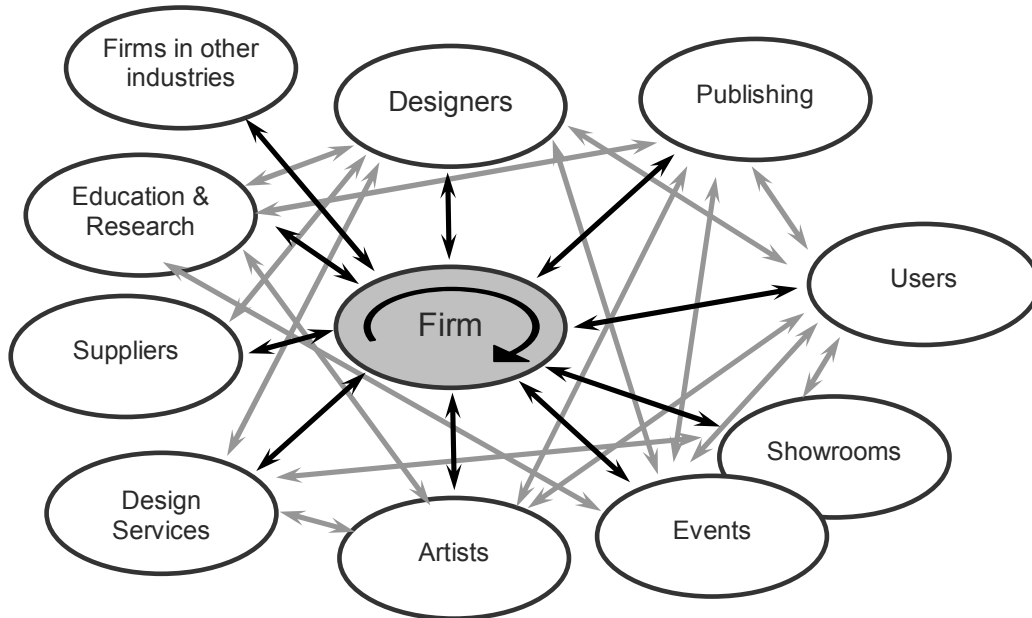


Figure 3. The Design Discourse surrounding a firm (source: Verganti 2008).

Consider for example Artemide, a high-end lamp manufacturer, that has created several radical innovations of meanings². When trying to create new languages and meanings for their lamps their investigation is not limited simply to lamps and their functionality, but takes a broader perspective to understand what are the aspirations of people when living in their home, i.e. possible future domestic mindsets, actions and meanings, to be addressed by new proposals of lamps. Artemide is surrounded by several other actors that share their same problem (i.e. understanding future domestic mindsets and lifestyles), such as: firms in other industries but that address the same user-person in the same domestic context (such as manufacturers of furniture, small appliances, TV sets and stereos, broadcasting firms, etc...that are similarly willing to understand what people could want to experience in their domestic life), product designers (that have their own vision and language about

domestic lifestyle, a vision developed by working with several different firms in the industry), architects (who design houses and living spaces), magazines and other media of interior design (that often develop domestic scenarios), suppliers of raw materials (such as Bayer or 3M, that are interested in seeing possible future use of their new materials in household products), universities and design schools (where professors and students often conduct workshops to design domestic products), showroom and exhibition designers (that explore new organizations of spaces), artists (that are recognized as “symbolic creators” – Hesmondhalgh 2002 –, and whose pieces eventually often appear in houses). All these actors are interested in understanding possible future domestic scenarios; and all carry on, through their own processes and approaches, research into these scenarios, therefore developing knowledge about future socio-cultural models. Not only: with their actions and outputs (products, projects, reports, artworks, shows, etc.) they will contribute to *influence* what people will actually think and love when living in their homes. Interacting with these actors therefore increases Artemide’s capability to understand and influence socio-cultural models, and therefore increases its probability of developing radical innovations of meanings that in the future would be highly successful in the market place.

Italian manufacturers highly value their interaction with this network of actors. They consider these actors as *interpreters* of the evolution of future scenarios, with whom to share their own visions, exchange information on trends, test the robustness of their assumptions. What these manufacturers have understood is that knowledge about socio-cultural models is diffused within their external environment, and that they are immersed into a huge research laboratory, where designers, firms, artists, schools make their own investigations and interactions. And that these interpreters are also “seducers”, given that with their interaction they shape socio-cultural models and influence the meanings, aspirations and desires of people and users.

We call this networked laboratory the “*design discourse*”. This is a *collective research process on meanings and design languages, i.e. a continuous dialogue on socio-cultural models (foreseen and*

desired) and its implications on patterns of consumption and product languages, occurring through several explicit and tacit interactions among several actors both in the global and local setting.

Italian manufacturers recognize that an important part of their competitive advantage is built on their capability to access to and influence the design discourse, as a crucial carrier towards their users. Their capability to create radical innovations of meanings is therefore based on a research process that leverage on interpreters in the design discourse, including lead users, of course, but also and above all firms in other industries, artists, media, architects, cultural centres, designers, schools and universities, exhibitions, etc...

This process significantly differs from user centred design, both in nature and players (see Figure 4). In particular its basic characteristics are:

- it is a networked research process;
- it spans widely outside the boundaries of the firm, including users, but also and mainly several other interpreters;
- it is based on sharing of knowledge (about socio-cultural models, meanings and product languages);
- it also includes an action of influencing and modifying (through the interpreters themselves and their influencing and seductive power) the socio-cultural regime.

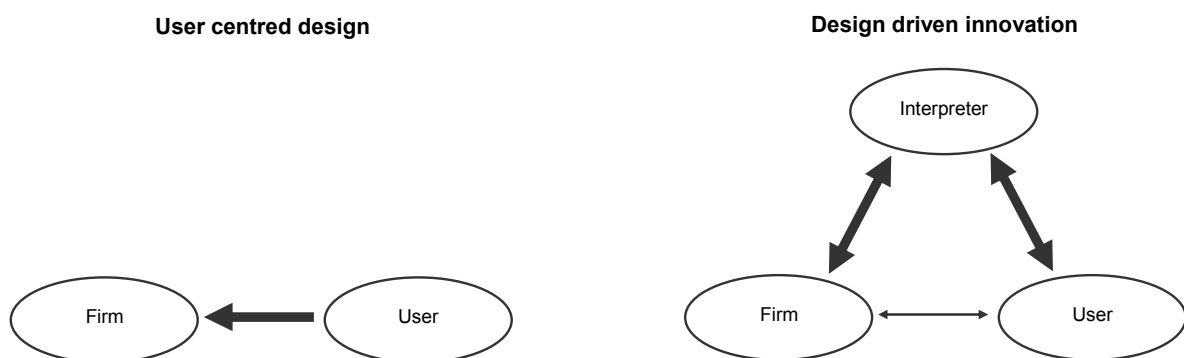


Figure 4 – User centered design and design driven innovation (source: Verganti 2008).

Whereas the key capability in user centered design is to get as close as possible to users, elicit their needs and be creative in finding solutions, the key capability in design driven innovation is accessing and sharing knowledge with the design discourse, and more precisely: to identify the key interpreters, to attract them and develop with them a privileged relationship, to share and recombine knowledge to build unique proposals, and to leverage on the design discourse to communicate with users.

This meta-model is the second fundament for our research agenda on design management. And this is not only because it provides us a basis to better understand how breakthrough innovation led by design occurs and can be managed. Also, and above all, this meta-model allows us to connect design driven innovation with existing theories of technology management that have already dealt with similar problems: how to achieve breakthrough (technological) innovations, how to manage networked research processes, how to share (technological) knowledge with external partners, how to influence the modification of (technological) regimes. The next section discusses this possible parallel between management of design driven innovation and management of breakthrough technological innovation, in order to suggest possible directions for the research agenda on design management.

The research agenda: Investigating design by leveraging on theories of technology management

In the previous section we have discussed how design driven innovation, i.e. the radical innovation of product meanings and languages, may occur by managing a networked research process. This process implies knowledge exchange with the design discourse, i.e. with those interpreters that

share the firm interest of understanding (and influencing) the evolution of socio-cultural models and design languages in a given context of use.

This process has been hardly investigated in design management literature, which has been mainly focused on cross-functional teamworking, on user-centered processes, on creative methods and on concept generation and product development. Our meta-model move our attention from cross-functional processes occurring within a firm to networked processes that mostly occur outside a firm, from users needs to socio-cultural models, from tools and methods to knowledge, from development to research. We need therefore new theory.

In this section we show how, in order to build this new theory, instead of starting from scratch, we can profit from a field that have already investigated a similar problem, albeit applied to a different type of knowledge and innovation: technology and functionality instead of languages and meanings. This field is technology management, and in particular those theories that have investigated the management of radical technological innovation. Our purpose in this section is specifically to show how processes and concepts in design driven innovation and radical technological innovation somewhat mirror each other; and ultimately to suggest and stimulate a direction of research on design driven innovation that can leverage on decades of research on technology management, if adapted to this peculiar problem.

Table 1 summarizes our discussion. In the left column it enlists concepts that, according to our research illustrated in the previous section of this article (and that has been further elaborated in Verganti 2003 and 2006), play a major role in the development of design driven innovations. In the right column it highlights how these concepts are mirrored in theories of technology management. Before illustrating each single concept and connection, we clarify the criteria that have inspired our analysis.

First, the scope of our analysis is *management of innovation*, and in particular it concerns the relationship between design management and theories of technology management. This has two important implications:

- our focus is on *management* issues. Here we are not focused on how socio-cultural models evolve, on how the world of cultural production may affect them, on how signs, languages and symbolic elements are shaped and diffuse in society. These issues are object of analysis in fields that usually do not adopt a managerial perspective, such as cultural anthropology, cognitive sciences, semiology, sociology of culture and especially production of culture (Becker, 1974 and 1982, Du Gay, 1997, Peterson and Anand, 2004). In these fields we could also find parallels and confirmations of our meta-models: for example scholars of production of culture speak of symbolic creators (Hesmondhalgh, 2002), or cultural intermediaries (Hirsch, 1972) instead of interpreters, or they speak of circles (Kadushin, 1976) instead of the design discourse. But these analogies do not help us to investigate the managerial practices of design driven innovation. Rather, they may be more useful to investigate the sociological dynamics of design driven innovation and may find a more direct connection with theories of sociology of science and technology (for example with Actor-Network Theory, Latour 1987) rather than with management of technology;
- our analogies are with management of *technology*. Indeed, whereas the investigation of design have been approached by a number of management disciplines, such as organization (Amabile 1996, Leonard and Swap 1999, Hargadon and Fanelli, 2002, Boland and Collopy 2004) and marketing (in particular cultural branding, that investigates how brand value may be created by understanding the evolution of cultural models in society, see for example Holt, 1997, 2002 and 2003), scholars of technology management have traditionally not applied their theories to design, and when that is happened it has been within the framework of product development and concept generation (Walsh et al. 1992, Walsh 1996, Shane and Ulrich, 2004, JPIM 2005a and JPIM 2005b). As design has been often related to styling or

to user-centred innovation, and as its action of radical innovation of meanings has been overlooked, minor have been the attempts to investigate design as the result of a research process, and to apply to it theories of managing breakthrough technological changes (for some early effort see Verganti 2003 and 2006; Utterback et al. 2006).

Second, our purpose here is to explore *connections* between concepts in management of radical innovation of meanings and concepts in management of radical innovation of technologies. In examining the concepts in Table 1 we will not therefore discuss in depth each single theory listed on the right column of the Table (for which we refer to the existing literature on technology management³), nor we will explain how these theories can be applied to design driven innovation (left column of the Table), as this application and adaptation is what we hopefully aim to stimulate with our discussion. We will therefore show how the concepts in the two columns are analogous, place investigation of design driven innovation in the framework of theories of technology management, and therefore suggest possible research questions and models that can constitute a research agenda for design management.

MANAGEMENT OF INNOVATION

Language and Meaning	Technology and Functionality
<p>a. Design driven (Radical innovation of meanings and languages)</p>	<p>Technology push (Dosi 1982) Incumbents and disruptive innovation (Christensen 1997, Christensen and Raynor 2003)</p>
<p>b. Socio-cultural regimes</p>	<p>Technological regimes (Latour 1987, Callon 1991) Complementary assets (Teece 1986)</p>
<p>c. Archetypes, Icons</p>	<p>Dominant Design (Utterback, 1994) Business Classics (Sanderson and Uzumeri, 1995)</p>
<p>d. Languages and signs</p>	<p>Architectural and component innovation (Henderson and Clark 1990, Baldwin and Clark 2000, MacCormack et al. 2006)</p>
<p>e. Design research</p>	<p>Technological Research (Burgelman et al. 2004) Resource-based innovation (Kogut and Zander 1992) Knowledge generation, integration and retention (Iansiti, 1997)</p>
<p>f. Design Discourse</p>	<p>Business Ecosystems (Iansiti and Levien, 2004) Open Innovation (Chesborough, 2003)</p>
<p>g. Key Interpreters</p>	<p>Alliances, trust and cognitive distance (Granovetter 1982, Noteboom 1999) Co-Design and supplier involvement (Clark, 1989, Liker et al. 1995, Sobrero and Roberts 2002)</p>
<p>h. Language Brokers</p>	<p>Gatekeepers (Allen 1977) Technology Brokers (Hargadon 2003)</p>
<p>i. Immersion</p>	<p>Absorptive Capacity (Cohen and Levinthal 1990)</p>

Table 1 – Analogies between management of radical innovation of meanings and management of radical innovation of technology, and possible related theories

a.) Changes in socio-cultural models, disruptive innovation of meanings and incumbents

The first analogy between theories of technology management and design driven innovation has been already discussed in section 3. Design driven innovation is a new radical proposal pushed into the market, with an approach that reminds the attitude and processes of breakthrough technological innovation.

One could therefore wonder whether the *radical* nature of design driven innovation poses to firms challenges that are similar to the challenges of radical technological innovation. In particular, as the evolution of socio-cultural models in society, alike technological transitions, follows a pattern of incremental and radical changes, one can wonder whether radical change in society and culture may have a disruptive effect on leading incumbent firms, i.e. those firms that master a given trajectory of a design language. Do radical innovation of meanings pose significant challenges to incumbents, which risk to remained locked into their design trajectory? For example, will Italian manufacturers be capable to cope with a global shift in cultural attention to eastern societies? If a core competence for design driven innovation is the network of interpreters that have close interaction with a firm, a major shift in the locus of cultural production could for example jeopardize a firm's capability to interact with the design discourse. The firm's privileged network of interpreters that allows access to the design discourse may therefore be both a major asset but also a core rigidity for the firm itself, similarly to what happens in technological transitions (Glasmeier 1991). Italian entrepreneurs recognize how managing the dynamics of the network of interpreters is a major long term challenge (Verganti, 2006):

“It is easy to make a list of the top ten designers of the past ten years. But I'm virtually certain that fewer than half of them will be among the top ten designers of the next ten years”.

Alberto Alessi, CEO Alessi.

Theories in technology management have dedicated much attention to how firms cope with technological paradigms and transitions (Dosi 1982, Abernathy and Clark 1985, Tushman and Anderson 1986), and especially to challenges faced by incumbents (Christensen and Rosenbloom 1995, Christensen and Bower 1996, Christensen 1997, Christensen and Overdorf 2000, Chesbrough 2001, Christensen and Raynor 2003, Danneels 2004, Veryzer 2005). These theories could provide additional insights to investigate the reaction of design leaders to major cultural shifts. There are indeed examples of firms that have been capable of surviving major transitions, thanks to their capability to continuously refresh and restructure their network of interpreters. Alessi, for example, periodically activate major research projects to explore new radical languages right to the purpose of identifying new architects and designers outside its current portfolio. Apple in the mid of the '90s has searched its VP of Design (Jonathan Ive) outside the typical network of interpreters in the computer industry (Ive was known to be a bathroom designer).

b.) Socio-cultural regimes and the role of complementary assets

As discussed in section 3, design driven innovation implies a modification of socio-cultural regimes. The attitude of Italian manufacturers to identify key interpreters according to their capability not only to interpret but also to *influence* the evolution of socio-cultural models is an indication that successful firms care not only about the creation of a new proposal, but also about the *modification* of the context in which to propose the innovation.

A similar pattern has been shown by radical innovations of technologies, which ask for significant changes in the environment (technological frame) in which products are used (Latour 1987, Callon 1991, Geels 2004). In terms of managerial implications, theories of technology management suggest that when an innovation has a significant impact on a technological frame, its success significantly depends on the *complementary assets* controlled by the firm, such as complementary components, distribution channels, production, service, etc. (see the seminal work of Teece (1986)). Do complementary assets play also a major role in explaining the success of design driven

innovation? A stimulating array of research could investigate to what extent the success of design driven innovations such as the Apple I-Pod or the Swatch may be explained by the control of these assets.

c.) Dominant languages and dominant designs

Studies on cultural anthropology and cultural branding show that the meaning given to products often coagulates around archetypes and that often some products and brands may emerge as icons that may survive longer than normal competitors (Holt 2003). Similar dynamics have been shown by studies in technology management. We refer here particularly to two concepts: dominant designs and business classics. A dominant design is “the design that wins the allegiance of the marketplace, the one that competitors and innovators must adhere to if they hope to command significant market following” (Utterback, 1994). Theory on technology management has suggested that industry dynamics change significantly in nature after a dominant design emerges: competition moves from product innovation to process innovation and efficiency and the number of competitors significantly decrease (Utterback and Abernathy 1975, Suarez and Utterback 1995). In addition Sanderson and Uzumeri, in their investigation of the success of the Sony Walkman, find that some models (that they call “business classics”) have longer life cycle than others, and trace back this phenomenon to the management of product families (Sanderson and Uzumeri, 1995).

These theories have focused mainly on technological and functional features (a dominant design for example “takes the form of a new product synthesized from individual *technological innovations* introduced independently in prior product variants”). We could leverage on these theories to explore the nature of competition as a consequence of design driven innovation. Is competition affected by the emergence of archetypes and icons? Is the number of competitors being reduced after a new archetype is created? First explorations on large data sets seem to show that industry dynamics are less affected by the emergence of dominant product languages (Dell’Era and Verganti, 2006), and

instead, cultural dynamics and meanings have more effect on product longevity and the emergence of business classics (Marchesi et al., 2003).

d.) Architectures and components as languages and signs

Studies in technology management have shown that innovation may concern single product components or entire product architectures (Henderson and Clark 1990). Proper architectural designs can also facilitate innovation through recombination of single components (Baldwin and Clark 2000). However, the innovation of the architecture itself tend to pose a greater challenge, as product architectures are strictly entangled to the organization of the innovation process of a firm, and therefore questions its existing core competence (MacCormack et al., 2006). We may wonder if similar dynamics concern the innovation of single specific signs (the components) compared to innovation of entire design grammars and languages (the architectures), with the latter being more managerially challenging than the former. That these dynamics are happening and worth exploring is testified by studies on product semiotics, that actually and curiously follow similar patterns of investigation, where rethoric figures are used as operators to create new combinations of signs, similarly to what happens with modular architectures (Van Onck, 1994 and 2000, Dumas 1999). The *managerial* implications of these investigations of product semiotic remain however largely unexplored (Karjalainen 2003, Kreuzbauer and Malter 2005), and studies on technological architectures may provide useful support.

e.) Design as research: a knowledge-based exploration of new languages and meanings

Studies on design management have often considered design as a creative process occurring during concept generation and product development. Analysis of leading Italian manufacturers shows that the process that leads to design driven innovation is not based on peculiar creativity tools or methods. The major asset leveraged in radical innovation of meanings is *knowledge* about the evolution of socio-cultural models. The process of generating and assimilating this knowledge

(through interaction with the design discourse) has been properly documented by studies Italian manufacturers (Zurlo et al., 2002) or even by the manufacturers themselves (Officina Alessi 1983, Mendini 2003). This process starts well *before* concept generation and product development (see Figure 5, Verganti 2008).

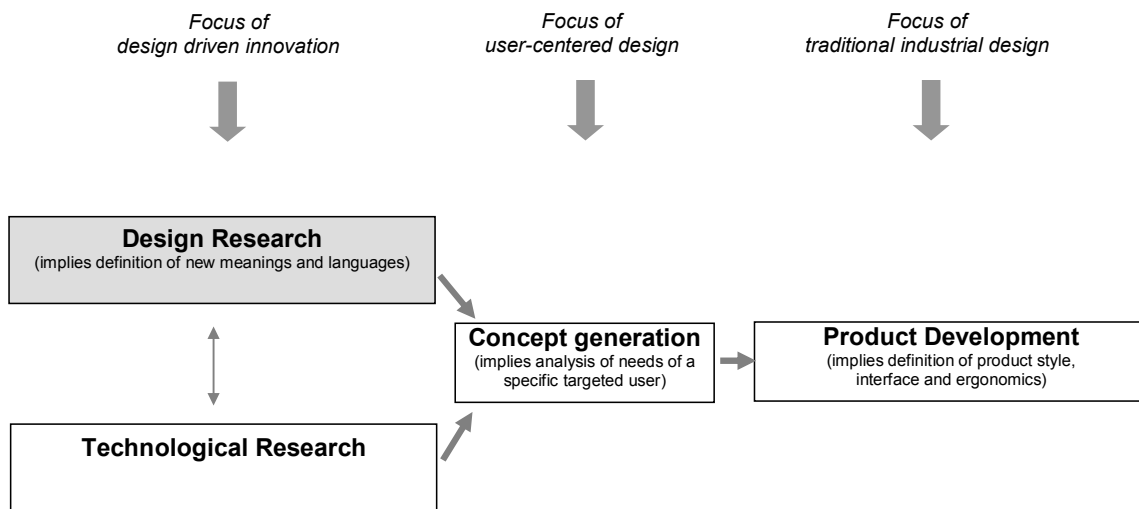


Figure 5 – Design driven innovation as *research*

Consider for example the relationship between the lighting company Artemide and Memphis, the well-known radical cultural movement founded by architect Ettore Sottsass in Milan in the early ‘80s. The group of architects belonging to Memphis wanted to experiment the application into products (in particular in furniture) of the bold breakthrough language of post-modernism. That language was completely in contrast with the dominant language in the market at that time (the minimal “good design” of the seventies and eighties). Ernesto Gismondi, chairman of Artemide, was one of the major financial promoter of Memphis, not because of his love for art or for a sense of patronage, but because this circle was for him a real research laboratory on new languages and because those architects were design *researchers* (Verganti 2006):

“Ettore Sottsass needed some funding for Memphis. I gave them money and let them free to do what they wanted. *For me, this was a laboratory*”

Ernesto Gismondi, Chairman, Artemide

While user-centred design has the merit of moving the attention of design management scholars and practitioners upstream from product development to concept generation, the investigation of design driven innovation asks us to move our focus even earlier in the innovation process, where firms sense the dynamics of socio-cultural models and think of new languages and visions with an exploratory aim. This process resembles a typical process of technological *research*, aimed at untargeted *exploration* of new technical possibilities. Differently than concept generation, *this is more a knowledge-based process rather than a creativity-based process*. The sentence of Gismondi also underlines that we are not talking here of research on sociological and socio-cultural trends. Alike technological research, design research is *applied*: it is the real exploration of new languages embedded into *artefacts*, and indeed also implies playing with new technologies and new materials. Theories on technology management may provide useful models to study design as a knowledge-intensive research process in firms. In particular we refer to studies that apply a resource-based perspective to innovation (Kogut and Zander 1992, Leonard-Barton 1995) and that look at innovation as a process of generation, integration and retention of knowledge (Weick 1995, Iansiti 1997).

f.) The design discourse and the paradigm of open innovation

The key issue for firms pursuing design driven innovation is accessing and internalizing knowledge in the design discourse. This is a collective and networked research process on meanings and design languages, that takes places *outside* the boundaries of the firm. How companies may develop strategies and routines to effectively interact with the design discourse? Studies on technology

management may again provide significant insights in this regard. Indeed they have recently witnessed a significant growth of attention to how firms may manage research processes that cross the firms' boundaries (Soh and Roberts 2003, Sorenson and Waguespack, 2005). They have shown how firms should manage research and development in a systemic perspective, where their R&D lab, albeit large, is only a small part of a huge network of researchers, institutions and firms (Rigby and Zook 2002, Wolpert 2002, Huston and Sakkab 2006). Scholars in this perspective talk of Business Ecosystems (Iansiti and Levien, 2004) or Open Innovation (Chesbrough, 2003, Christensen 2005). Eric Von Hippel has further investigated the crucial role of users in these networks of innovators (Von Hippel, 2005). When considering innovation of languages, this phenomenon is even more relevant. Whereas technologies may be developed by an internal R&D department with controlled experiments, socio-cultural models are instead shaped by society, and internal R&D labs can only detect them and influence them (Durgee 2006). Studies on design driven innovation can therefore benefit from the wealth of technology management investigations on open innovation, and vice-versa.

g.) Managing the network of interpreters in the design discourse: alliances and co-design

If design driven innovation is favoured by the interaction with the design discourse, then managing the interaction with key interpreters in the design discourse is a crucial issue. Indeed, Italian manufacturers place great attention to identifying the key interpreters in the design discourse, attracting them and developing with them a privileged relationship. For example, one of the key consultants of Alessi, who helped the company to spot new talented architects worldwide and helped the company to explore new radical languages, is Alessandro Mendini. The relationship built by Alessi with this key interpreter is definitely unique:

“Alessi doesn't make us feel as if we work for Alessi. Rather, we feel as if Alessi is working for us!”

Alessandro Mendini, Architect (cited in Moon et al. 2004)

How firms pursuing design driven innovation should effectively select, attract and cooperate with key interpreters? How should they reward them? Management of technology faces similar challenges when dealing with key partners (Noteboom 1999), suppliers of technologies (Sobrero and Roberts 2001), and scientists (Stern 2004) to be involved in cooperative research processes. And indeed the past decades have been filled by investigations on alliances and cooperation among firms in product development (or co-design, Clark 1989, Liker et al. 1995). Several factors that can lead to successful cooperation have been underlined, such as trust, cognitive proximity and weak ties (Granovetter 1982, Noteboom 1999). Do similar findings hold also when dealing with design driven innovation?

h.) Designers as brokers of languages and as gatekeepers

Among all interpreters in the design discourse with which a firm may interact, there are some that have crucial network position. Some may act as crucial gates that facilitate a firm access to the design discourse. Others are bridges between different socio-cultural worlds and industries, and therefore facilitate the transfer of knowledge on meanings and languages among different contexts.

Similar roles may be identified in technological innovation.

First, seminal studies on the organization of research and development have analyzed the role of *gatekeepers* (Allen 1977). Key interpreters, and in particular designers, may similarly act as gatekeepers: they facilitate the access of their manufacturing clients to the ongoing discussion about design languages, bring bits of knowledge, help their clients to interpret the design discourse, and to position themselves into this discourse. The role of Alessandro Mendini may be assimilated to a gatekeeper, as he has been for Alessi a crucial gate to access the design discourse.

Second, recent studies have observed the role of *brokers*, that move technological knowledge among different industries (Harada, 2003). Some investigations even analyzed the brokering role of designers and design firms (Bertola and Texeira 2003, Hargadon 2003). A study on IDEO for

example has shown how this design firm acts as a *technology* broker, having access to as much as 40 different industries and exploiting its network position to move solutions across industries (Hargadon and Sutton 1997).

What is peculiar in design driven innovation is that designers act as brokers of knowledge on *languages* and not only on technology. Language brokering is even easier as product languages are not industry specific: they move *across industries* more fluently than technology. Consider for example the diffusion of colored translucent materials from home furniture to computers (a linguistic exercise that let the Apple I-Mac speak the language of home rather than office. In this case Jonathan Ive, the VP of design of Apple, with previous experience in domestic products, acted as a broker of languages from households to computers). Design languages can also move *across different socio-cultural worlds* (for example across different countries), although this is a more complex process than fertilization of signs across industries, given that meanings are significantly culturally embedded. Indeed, Italian manufacturers involve a great deal of foreign designers in their innovation process, combining and integrating the brokering of knowledge on both the local and global settings.

Hence, similarly to the action of technology brokers, designers exploit their network position to move languages (and the meaning and values attached by people) across industries and socio-cultural worlds. As studies on technology management have deeply investigated the role of knowledge brokers, can these studies stimulate a better comprehension on the role of key interpreters on design driven innovation? For example, recent investigation, have questioned the role of gatekeepers and knowledge brokers, as they jeopardize the capability of firms to deal with long term changes (Fleming et al. 2005) and have even questioned the role of teamworking when dealing with breakthrough innovation, which seems more favored by the action of lone inventors (Fleming 2006). Do language brokering faces similar challenges?

i.) Immersion in the design discourse and absorptive capacities

Interacting with the design discourse to access knowledge on product languages is not sufficient for design driven innovation. A firm needs also to interpret this knowledge, to select important stimuli and disregard others, to interiorize it, and finally to develop *its own unique vision* and language. How does selection and assimilation of knowledge on new meanings and languages actually occur? How is a company like Alessi, that receives every year thousands of sketches and designs from several designers around the world, capable to recognize those designs that will be successful in the marketplace? What does make Alberto Alessi so effective in selecting a future influential interpreter before his competitors do and in understanding and assimilating her radical language, similarly to a successful “merchant of art” who spots great painters when they are still unknown?

Literature on technology management has dealt with a similar problem. One of the most interesting model in this regards is the concept of *absorptive capacity* introduced by Cohen and Levintal (1990). An organization’s absorptive capacity is indeed its ability to understand and value external knowledge, and therefore to make sense of, learn about, and adopt new approaches. According to Cohen and Levintal, access to outside information cannot be restricted only to gatekeepers, especially in rapidly moving environments, but should be extended to the entire organization. More importantly, assimilation and exploitation of external knowledge may occur only when the organization has already had prior experience in the field (combined with diversity of expertise). We may wonder if interaction with the design discourse also implies the existence of absorptive capacities and how these can be created. This would make an interesting point that would actually explain why developing a superior capability to leverage on the design discourse is not an immediate endeavour and may rather take significant time. An organization should in fact start a long (hopefully virtuous) circle of creation of absorptive capacities, interaction with the design discourse, strengthening of the ties with key interpreters, further development of absorptive capacities, and so on. And indeed, observation of Italian manufacturers, seems to show that

experience in the field, and long standing *immersion* in the design discourse have a major role in explaining the capability of those manufacturers to select and assimilate design knowledge:

“My luck? Since I was a teenager I frequented the great architects with my father”

Carlo Molteni, Chairman, Molteni

Conclusions

The growing attention to design as an important competitive weapon has recently contributed to a wealth of studies on design management. These studies have mainly focused on user-centered design, an approach that starts from a deeper understanding of user needs and applies design thinking to creatively generate new product concepts. Although investigations on user-centered design have provided relevant and crucial contributions, yet analyses of leading design intensive manufacturers (such as Alessi, Artemide and other firms in Northern Italy) show that innovation led by design may also follow a significantly different pattern. In particular, starting from the definition of design as “making sense of things”, and therefore as the action that aims at innovating the meaning and language of products, this article has focused on design driven innovation, that is the *radical* innovation of products meanings and languages. Design driven innovation is not pulled by user requirements or observation. Customers hardly help in understanding possible radical changes in product meanings as they are immersed in a socio-cultural context that leads them to interpretations that are in line with what is happening today. Radical changes in meanings instead are coupled with radical changes in socio-cultural regimes, that might be understood only by looking at long-term phenomena with a broader perspective. Design driven innovation is therefore a proposal *pushed* by a firm’s vision about possible breakthrough meanings and product languages. Theories of user-centered design therefore hardly explain how this radical approach to design, that have a central role in the competitive strategy of design leaders, may be effectively managed. This

article has aimed at providing a first contribution to fill this empty spot in design management theories.

First, we have introduced a meta-model for the management of design driven innovation. In this meta-model a manufacturer's ability to understand, anticipate and influence the emergence of new product meanings is built by leveraging on external interpreters (architects, artists, firms in other industries, schools, the media, etc...) who share its same problem: to understand the evolution of socio-cultural models, and propose new visions and meanings. Among these interpreters flows a continuous collective process of investigation and experimentation on meanings and languages that we call the "design discourse". Managing design driven innovation therefore implies to manage the interaction with the design discourse, in order to access, share and internalize knowledge on product languages and influence the shifts in socio-cultural regimes.

Second, we have then used this meta-model to highlight analogies between design driven innovation and the research process that leads to breakthrough technological innovations. These processes share many similarities, whit the major difference that the former deals with knowledge on languages and meanings and the latter deals with technological knowledge. In both cases we talk of breakthrough changes, of required changes in the contextual environment (socio-cultural or technological regime), of landmark products (icons or dominant designs), of sharing of knowledge in network of innovators (design discourse or business eco-system), of collaboration with external experts (key interpreters or gatekeepers), and so on. These analogies allow to ground investigation of design driven innovation on theories of technology management, therefore leveraging on decades of research in this field.

Two clarifications about the scope of our discussion: first, we have explored analogies with theories of technology management. We are conscious that these theories are not the sole lenses through which we can look at the management of radical innovation of meanings (and indeed additional perspectives may be provided for examples by studies on cultural branding). Anyway, their application to design driven innovation can bring novel insights that add to other existing

contributions. Second, we are aware that theories of technology management cannot be moved as such into the investigation of design driven innovation. They need to be translated and adapted to analyze a phenomenon that of course has its own peculiarities (for example we have shown that unlike technologies, languages move more easily across industries, but less fluently across countries). And vice-versa we may expect that theories of technology management themselves may end up being improved and strengthened from these translations and adaptations into design management. This way, this article may possibly contribute to pave the way towards a more unified theory of innovation management, that may hold for both innovation of technologies and meanings. An important final comment is that our purpose here has not been to solve, but to *activate*. We did not provide definitive answers to research on design driven innovation. Rather our aim has been to stimulate further investigation by suggesting possible lines of research in a field that is still largely unexplored. Our hope is that this article is only a first step in a long exploration effort to come.

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FOOTNOTES

¹ When creating the “family follows fiction” product line, Alessi was inspired by theories of paediatrician and psychoanalyst David Winnicott on transitional objects, of psychoanalyst Franco Fornari on affective codes, and of Jean Baudrillard on object systems. David Winnicott in particular focused on the role that objects have in the psychological development of children, who associate feelings and meanings to their daily objects. He investigated the role of “transitional objects”, i.e. objects with high symbolic meaning, that help children in the transition from being fed from their mother to a more autonomous psychological status, and that become almost indispensable in their life regardless to their function (e.g. the well-known Linus security blanket). Winnicott showed that adults still have transitional objects (although not blankets or toys!).

² An example is Artemide Metamorfosi, a lamp producing colored atmospheres, controlled by a computer. With Metamorfosi, Artemide has radically redefined what people search for in a (high-end) lamp: from having a beautiful object in their living room to having a customized light that makes them feel better in their domestic environment according to their own emotions.

³ It is worth notice that theory on technology management is evolving itself and in many instances there is not a single model or view shared by all scholars on the field. There are for example different definitions and perspectives when looking at radical technological innovation, or at innovation processes. The discussion of trends and different schools in this field, which would imply a much more detailed and dedicated analysis, goes well beyond the scope of this article.