

Radical Design and Technology Epiphanies: A New Focus for Research on Design Management

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The past decade has ushered in a growth of interest on design, both among scholars and practitioners. The consequence has been the development of a wealth of new theories on design, innovation, and design management. After a decade of studies, we have developed significant understanding about how firms may better analyze customer needs through user-centered design, how they can generate better ideas through brainstorming methods and multidisciplinary teams, how consumers value the form of products. Yet, as often happens in research, many studies have focused on the most visible and measurable forms of design (those connected to the clear processes and methods of user-centered design). The consequence is that, apart from a few exceptions, the focus of theory development has been on incremental innovation enabled by design: better user interface, improvements, differentiation, nice ideas and features that get rapidly imitated and obsolete. Scholars have often neglected some of the most intriguing forms of design, i.e., when design brings a radical perspective, when it contributes to the redefinition of an industry, and the creation of a new paradigm. In this short note I hope to set the stage for this new frontier of research in design management. In particular I propose two fields of investigation: the role of design to radically innovate the meaning of products and services, and the interaction of radical design with radical technologies, which I call technology epiphanies, i.e., the identification of the most powerful meaning enabled by a breakthrough technology.

Introduction

As a scholar of management of innovation, I have always struggled to find a definition of design that could be focused enough to differentiate it from other forms of innovation, but broad enough to move beyond the narrow acceptance of design as the form of products. This is not the place to discuss existing definitions (this special issue already provides several). So I start directly from the definition that I believe better encapsulates the deep peculiarities of design in innovation. Following the approach of many design theorists, 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 I will adopt here the definition proposed by Klaus Krippendorff in *Design Issues* (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).*

The connection between design and innovation, therefore, is that design is about the innovation of product and service meanings. By “meaning” we mean the “why” of a product—the profound psychological and cultural reasons people use a product. Meanings can imply an individual or a social motivation. Individual motivation is linked to psychological and emotional meaning: what I intimately feel when I use a product. Social motivation is linked to symbolic and cultural meaning: what the product says about me to others.

Many companies and scholars acknowledge that market competition is driven by products’ meanings. People buy and use products for deep reasons, often not manifest, that include both functional utility and intangible psychological satisfaction. Studies in various scientific disciplines, from design to psychology, from marketing to sociology, from cultural anthropology to semiotics, have provided so many insights into consumption behaviors that few people would challenge the statement that “every product has a meaning” (Baudrillard, 1968; Bayazit, 2004; Boztepe, 2007; Cooper and Press, 1995; Csikszentmihalyi and Rochberg-Halton, 1981; Douglas and Isherwood, 1980; Fournier, 1991; Heskett, 2002; Hirschman, 1986; Levy, 1959; Norman, 2004; Peterson, Hoyer, and Wilson, 1986; Proni, 2002; Sheth, 1991; Van Onck, 2000; Zaltman, 2003). Yet many investigations do not focus on how to innovate meanings. Meanings

are considered as given—are subjects of investigation, not of change. Hence, studies on user-centered innovation have striven to understand how people give meaning to things.

Many examples discussed in my recent book (Verganti, 2009) show that product meanings instead do change, and they change radically, often as a consequence of a new radical proposal pushed by a company. Take the example of the Nintendo Wii, a game console with motion-sensitive controllers that allows people to play games by making real movements. People for example might serve tennis balls by circling their arms overhead or play golf by swinging. Before the Wii, games consoles were considered entertainment gadgets for children who are great at moving thumbs—a passive immersion into a virtual world. And indeed, Sony and Microsoft further reinforced this meaning by developing consoles, the Playstation 3 and the Xbox 360, with more powerful graphics and performance. The Wii overturned this meaning: it stimulated active physical entertainment, in the real world, through socialization. The intuitiveness of its controllers made it easy for everyone to play. The Wii transformed consoles from an immersion into a virtual world approachable only to niche experts into an active workout for everyone. People did not ask for that meaning. But they loved it once they saw it. Six months after release, Wii's sales in the U.S. market doubled the Xbox 360 and were four times more than the Playstation3, selling at an even faster rate than the most successful console ever created.

BIOGRAPHICAL SKETCH

Dr. Roberto Verganti is professor of management of innovation at Politecnico di Milano and visiting professor at the Copenhagen Business School. He serves on the Board of the European Institute for Advanced Studies in Management, on the Advisory Board of the Design Management Institute of Boston, and on the Editorial Board of the *Journal of Product Innovation Management* and associate editor for the *European Management Review*. He has served as an advisor, coach, and executive educator to senior managers at a wide variety of firms such as Ferrari, Ducati, Whirlpool, Indesit Company, Xerox, Kodak, Samsung, Hewlett-Packard, Masco, Barrilla, Nestlé, STMicroelectronics, Intuit, and Vodafone. He has also helped national and regional governments around the world to conceive design and innovation policies. He is the author of *Design-Driven Innovation: Changing the Rules of Competition by Radically Innovating What Things Mean* (Harvard Business School Press, 2009), and numerous articles in journals such as *Management Science*, *JPIM*, and the *Harvard Business Review*.

Radical Design: The Radical Innovation of Meanings

We still do not have a clear theory about how firms can successfully radically innovate the meanings of products and services. A few hints are provided in the book cited above (Verganti, 2009) and in a few articles I published in *JPIM* (Dell'Era and Verganti, 2007; Verganti, 2008). But we need much more investigation, especially backed by quantitative empirical analyses. What we have learnt, in these early investigations is that, definitely, radical innovation of meanings hardly comes from consumers and is hardly facilitated by getting closer to users. Executives who have invested in radical innovation of meaning acknowledge that rather than start with user needs, the process goes in the opposite direction: the company *proposes* a breakthrough vision.

Ernesto Gismondi, the chairman of Artemide (a leading lamp manufacturer) claims that to create radical innovations through design, he does not start from the market. Traditional market approaches, as well more recent user-centered techniques (ethnography, etc.) are far from being popular in his firm (Verganti, 2006). Traditional market-pull methods of innovation—which scrutinize customer acceptance before releasing a product to the market—sometimes even restrict radical innovation of meaning. That is because radical innovation assumes a different context and user approach than those of products already on the market. If a company tests a breakthrough change in meaning by relying on a typical focus group, people will search for what they already know. And they will not find it in a product that is radically innovative, unless they encounter it in the right scenario. When Nintendo created the Wii it did not ask users their opinion. According to Shigeru Miyamoto, senior marketing director and general manager of entertainment analysis and development, “We don’t use consumer focus groups. We got a lot of feedback from developers in the industry.” Satoru Iwata, president and CEO, attested, “When we showed a glimpse of it at the Tokyo Game Show in September 2005, there was a stunned silence. It was as though the audience didn’t know how to react” (Hall, 2006). And we know that Apple, which many cite as a user-centered company, is everything but user-centered. Many times Steve Jobs has underlined that Apple does not start from users: “We have a lot of customers, and we have a lot of research into our installed base. But in the end, for something this complicated, it’s really hard to

design products by focus groups. A lot of times, people don't know what they want until you show it to them" (Young and Simon, 2002, p. 262).

What these executives are telling us is that radical innovation of meanings does not occur when companies get closer to users. It goes in exactly the opposite direction: a company pushes a breakthrough vision into the market by making a proposal to people. Although this may sound blasphemous, scholars of management of innovation already know that radical technological breakthrough seldom emerges by chasing users. They result from the dynamics of science and engineering. And we also know, thanks to studies by Clayton Christensen, why incumbent companies are incapable of creating disruptive technological innovation: they are so focused on chasing the needs of their clients that they lose sight of the big picture (Christensen, 1997). The same is true of radical innovation of meaning. It does not occur when companies get closer to users with a huge lens and scrutinize how they behave in the current context. If Nintendo had closely observed teenagers in their basements using existing game consoles, it would have provided them with what they apparently needed: a powerful console with sophisticated 3D processing that could enable them to better immerse in a virtual world.

Radical Design and Innovation Theories

To understand the peculiarities of radical innovation of meanings, and the investigation pattern lying ahead, we may trace back design to theories of innovation management. There was an intense debate in the 1970s about the direction of innovation processes (technology push versus market pull), culminating in the milestone contribution of Giovanni Dosi (1982) suggesting that any innovation implies understanding of both technologies and markets. Dosi suggests however that 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, 1997; Christensen and Bower, 1996; Christensen and Rosenbloom, 1995; Dahlin and Behrens, 2005). Design-driven innovation, that is, the radical innovation of meanings, is indeed closer to technology push rather than user-centered innovation. Which also implies that we can perhaps leverage and adapt theories on technology

management to investigate the radical innovation of meanings (Verganti, 2008).

For example, from theories of technology management we can borrow the concept of *regimes* or *paradigms* (Dosi, 1982; Nelson and Winter, 1977). A technological regime dominates an industry: it is the set of research routines shared by engineers in the field and their beliefs about what is feasible, or at least worth attempting. Technological regimes signal the boundary between incremental and radical innovation. Incremental innovation occurs within a technological regime, whereas radical technological innovation is associated with a change of the dominant regime. Analogously, we can talk of a sociocultural regime or paradigm (Geels, 2004): the dominant sociocultural model in a social world. Innovation of meanings can occur within the current sociocultural regime, in which case it is incremental, or it may create a completely new regime, in which case it is radical. A company looking for radical innovation of meaning does not get too close to users, because the meaning users give to things is bounded by the existing sociocultural regime. Instead, when investing in radical innovation of meaning, companies such as Artemide take a step back and investigate the evolution of society, economy, culture, art, science, and technology. They have a superior ability to understand, create, and influence new product meanings.

These considerations clarify what are possible promising fields of investigation for innovation and marketing studies in the coming years. In particular, Figure 1 describes three modes of innovation (Verganti, 2009).

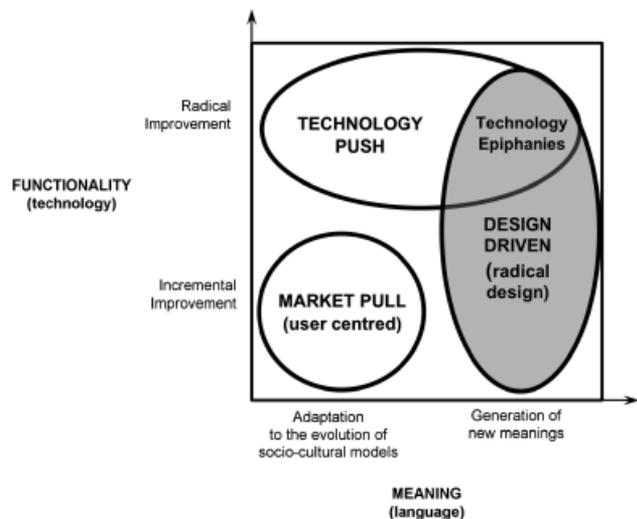


Figure 1. Innovation Strategies and the Positioning of Radical Design and Technology Epiphanies

- *Design-driven innovation (radical design)*, where innovation starts from the comprehension of subtle and unspoken dynamics in sociocultural models and results in proposing radically new meanings and languages that often imply a change in sociocultural 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. Indeed user-centered approaches still operate within existing sociocultural regimes, although, being more sophisticated than traditional market-pull processes, they may allow us to better understand how people give meaning to existing things;
- *Technology-push innovation*, that is, the result of dynamics of scientific and technological research. This is where many studies of technology management have been focused in the past.

Technology Epiphanies: When Radical Design Meets Radical Technologies

One area that is particularly interesting is the overlap between technology push and design-driven innovation in the upper right corner of the diagram. This is the area of the “technology epiphanies”: the identification of the more powerful and successful meanings enabled by a new technology.

This area of investigation is particularly promising in the coming decades, especially for scholars of technology management. Indeed, as companies open their innovation process to external parties (Chesborough, 2003; Pisano and Verganti, 2008), new technological opportunities become more easily accessible in abundance. The main challenge for executives is therefore shifting from being first in *launching* a new technology, to being first in finding the right *application* of technological opportunities.

Until now the main focus of investigations on breakthrough technologies has been on *technology substitutions*: how a new technology enables *substitution* of an old one to better satisfy *existing* market needs. Every novel technology however embeds the potential for a variety of applications, the most profitable of which are not visible until a firm impugns the existing market needs. Companies that look for *technology epiphanies* search for how a new technology

enables the creation of products and services that are more meaningful for people, even if these meanings do not fit with existing needs. Will this technology enable us to propose a completely new reason for customers to buy products, that, albeit unsolicited, they will love?

For example, Sony and Microsoft disregarded the potential of MEMS accelerometers (the components that make a Wii console sensitive to movements) because they were not helpful in targeting existing market needs: players were asking for a more sophisticated virtual reality that could let them immerse into a virtual world. Microsoft and Sony therefore invested significant budget to replace old CPUs with more powerful ones. Nintendo instead challenged the existing needs and found in MEMS accelerometers the potential for a technology epiphany. Thanks to their motion-sensitive properties MEMS could completely transform what a game console meant: from a passive immersion in a virtual world into an active entertainment in the real world.

This is the reason why we call this area of the innovation space a “technology epiphany.” Epiphany etymologically means “a manifestation that stands in a superior position; a perception of the essential nature or meaning of something” (Merriam-Webster Dictionary). Whereas the prior focus of design management scholars has been on how design can act as a differentiator in mature industries, this area means that there is a significant unexplored field of how design can act at the initial, fluid phase of an industry, when a breakthrough technology emerges.

Conclusions

There is no conclusion. This is just the start, hopefully, of a new fascinating journey for scholars of innovation management. The diagram in Figure 1 proposes a possible area in which researchers (especially young scholars), whether they come from marketing, technology management, or design, may direct their exploration effort: the investigation of how *radical* innovation (of *meanings*) may be driven by design, and how it interacts with breakthrough technologies (creating *technology epiphanies*). There’s much to do. But this is what intrigues us as scholars, isn’t it?

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