



FURNITURE INDUSTRY IN RESTRUCTURING : SYSTEMS & TOOLS

FURNITURE INDUSTRY IN RESTRUCTURING : SYSTEMS & TOOLS



Guidelines

Company positioning through innovation



Co-funded by the EUROPEAN UNION
European Social Fund
Article 6 Innovative measures

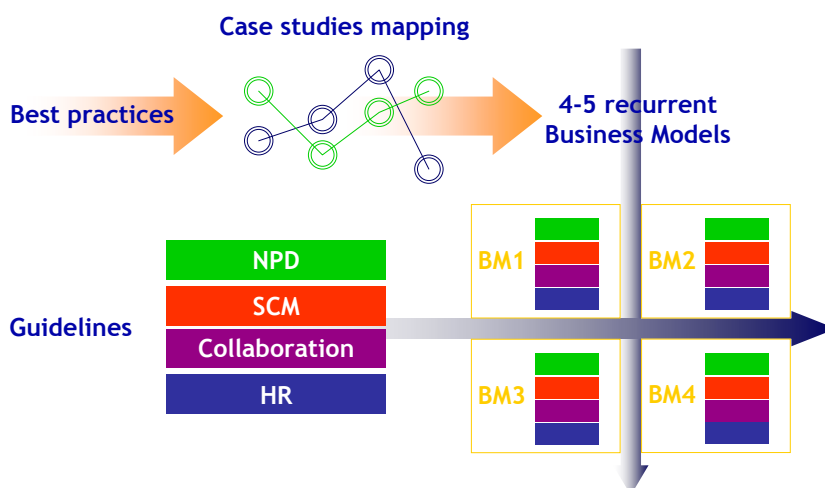
Contents

1	Objectives	4
2	Innovation defined	5
3	Approaching innovation	9
4	NPD metrics	22



The globalization is changing the structure of labor intensive industries such as the furniture industry. Increased imports at lower prices force the European manufacturers to look for competitive edges and if necessary to restructure their operations. Some looked at their business model, other at the product, the production, productivity or the relation with the final consumer or a combination of some or all of these different aspects. The solutions, some more successful than others they come up with are multiple.

The FIRST project has the ambition to look into this subject with the aim to formulate recommendations to serve as inspiration to manufacturers. The methodology used was to analyze 30 companies that either went to a restructuring or that had particular characteristics in one or more aspects of their business that allows them to (better) cope with the problems arising from the globalization. This analysis should lead to business models from which guidelines on specific strategies could be distilled.



During the work it rapidly became clear that there are almost as many business models as there are companies, and on suggestion of the advisory board of the project, it was decided to concentrate on guidelines for practical strategies in specific fields rather than develop entire business models. The advisory board also suggested to formulate these guidelines in short separate formats easily usable by interested manufacturers. This way the work resulted in the formulation of six guidelines around specific activities: product development and innovation, supply chain management, industrial co-operation, outsourcing, human resource management and electronic communications. In parallel the partners developed a sub contracting database for manufactures interested in co-operation as an instrument of increasing such co-operation between manufacturers in the EU and especially with manufacturers in the most recent EU Member States. Information on the project and on the database can be found on the UEA web site www.ueanet.com.

The analytical work has been done by the partners under the leadership and guidance of the MIP, the Polytechnic University of Milan and of AIDIMA, the Spanish technical furniture center. BFM, MEDIFA and the UEA and some of its other members contributed in the best practices and the redaction of the guidelines. Ifabrick, the information department of MEDIFA was responsible for the Web site and database.

The current booklet formulates guidelines on how to use product innovation in the furniture industry. It is not meant to suggest that European furniture manufacturers should follow the strategies described, but the booklet wants to contribute to the reflection on this subject by those manufacturers who feel that it might fit into their business model. We hope it serves them well.

Bart De Turck
UEA secretary general
FIRST project manager

I. Objectives

ANALYZING the etymology of the word innovation, we discover that the word stems from the Latin verb *novus*. A verb that ranges in meaning depending on the object in question. In fact, it can mean a simple renewal or change (from in- "into" + *novus* "new") of an object in question or it can mean to revolutionize it or invent something new. In fact, the Oxford dictionary defines innovation as "the introduction of new things, ideas or ways of doing.... a new idea that has been introduced or discovered".

Regardless of one's position on its etymological definition, what's important for companies in today's economy is that "innovation has become the industrial religion of the late 20th century. Business sees it as the key to increasing profits and market share. Governments automatically reach for it when trying to fix the economy. Around the world, the rhetoric of innovation has replaced the post-war language of welfare economics. It is the new theology that unites the left and the right of politics"

This statement by Gregory Daines of Cambridge University. is one of many that continuously bombards our times and underlines the central role that innovation is playing in our modern economy. It's not the mere definition of innovation however that can support companies in navigating the landscape of innovation, but more so the classification and terminology that can allow companies to create a common nomenclature of innovation principles that can guide them through the arduous task of innovating in a global marketplace.

Therefore, the objective of this manual is to give you a general understanding of innovation from an industrial-productive perspective in order to create the foundation that can support you in making innovation a fundamental element that defines your companies positioning with a globalized marketplace. To accomplish this objective, the manual is divided into 3 parts. The first section discusses the basic theories and nomenclatures of innovation. It has the objective to give you a general background and knowledge of the art and science of innovation. The second section of this manual instead focuses on describing the different approaches that companies adopt in strategically managing innovation. Finally, the last section is intended to help you understand in what position you are in managing innovation by offering a step-by-step diagnostic exercise that you can conduct on your company so that you can measure how well your are faring with respect to the market. In particular, it looks at the new product development metrics that can help you orient yourself in adopting a particular innovation strategy.





2. Innovation defined

Innovation nomenclatures

THE INCREASING levels of mutation of the political, social, economic, environmental and global context witnessed in the latter part of the 20th century has notably influenced the way in which companies do business. In fact, this continuous mutation makes them question and revisit their organizational models on a yearly basis from a business model, supply chain and a new product development perspective. As Galbraith states, the increased levels of uncertainty in a globally mutating environment requires an increase in the amount of information that needs to be processed in order to support the control and communication mechanisms of a company. Ansoff, in relation to this, has better defined the concept of environmental turbulence and has stated that in order for a firm to survive, a firm's strategy must match the turbulence of the environment. In fact, it is well noted that if a specific environment remains the same for some time, the largest proportion of incumbents will adopt similar strategies and will acquire similar capabilities. When turbulence however escalates, companies find themselves in the need to develop new capabilities to match the new level of turbulence.

Companies, however, respond in different manners based on their organizational profile and degree of organization openness to change. In fact, a company typically falls into one of 5 profiles: (1) stable, (2) reactive, (3) anticipating, (4)exploring and (5) creative

Stable companies are the closed-off, change resisting companies that fight all pressures to change. Typically, in an industry facing escalating turbulence, these are the first type of company to be shaken out. Reactive firms are those that, even though they are change resistant, will inevitably respond to turbulence, but only after the changes have damaged their performance. Anticipating companies instead are the change-seekers of an industry that will change when either the crowd changes or when the full impact of the change is felt. Exploring companies instead are characterized by the desire to seek out change before the majority of the industry smells the change. Finally the creative companies are those that create the changes themselves through innovation. Consequently, environmental turbulence influences both the magnitude and the nature of innovation and, in particular, the perception of turbulence will inevitably influences the strategic, managerial and behavioral decisions that will bring about the development of new products or innovation.

More specifically, the perception of turbulence will impact the way in which a company will innovate in terms of product development. A phenomenon that can range from simple changes to existing products of the development of products that are truly new to the world. Bearing this in mind, there are many definitions of product innovation that are important to understand in order to start thinking systematically about innovation. The most common nomenclatures are listed below:

Booz Allen Hamilton nomenclature : Objects of innovation

The objective of classifying innovations in this manner is that it divides the objects of innovation into separate categories based on what physically is innovated in terms of product innovation. Hence the attempt is to better define the types of efforts that the company will have to pursue when innovating.

1. Product modifications
 2. New product lines
 3. Product lines extensions
 4. New to the world products
 5. Process development (to reduce the costs associated with existing or new products)
 6. Product repositioning or Me-too products
- Pros/C

Pros/Cons: While this classification or taxonomy may seem complete, encompassing a wide sample of possible new product development scenarios, it also remains relatively generic since it does not formulate any relation between the various classifications. How does and to what degree does one classification influence the other? Moreover, how do they differ from each other if and when a company adopts a certain type of innovation strategy (Ex. Technology push Vs. market driven)? Finally, what does it truly mean to be new to the world and how do these various classifications relate to the degree of innovation ?

Christensen's degrees of innovation

The objective of this classification of innovation, based on Harvard Business School' Clayton Christensen research, is to classify the type of innovation a company does based on the degree to which the innovation disrupts the status quo. In particular, Christensen distinguishes between sustainable innovations and disruptive innovations where the former is associated to innovations that focus on the possibility to continue and improve upon the functionality of the product in order to satisfy the needs of an already identified target market, and the latter as those innovation that are able to attract unusual target markets into the realm of the developed innovation, and consequently create a sense of disruption in the market.

Pros/Cons: With respect to this latter type of innovation, the incumbents and their existing customers tend to develop attitudes of indifference towards these types of innovations because they are afraid that they can threaten or interrupt the status quo of product offerings affirmed within the industry. In fact, companies, given the very nature of disruptive innovations being based on the development of new capabilities and competencies for the company, rarely accept the possibility to develop disruptive innovations. In doing so, however, they run the risk of of being surpassed by new competitors entering into their markets.

Through this type of classification, Christensen brings to light a very important point with respect to the type of innovation that company want to develop: the threat that exists when a company decides to listen only to the needs and desires of the market without the necessary ability that could allow them to filter the appropriate from the inappropriate market signals.

Leiter's Radical & Incremental innovation

Another recent classification of innovation is the distinction made between an incremental innovation and radical innovation where the former is defined as an incremental improvement of already existing products that have either been developed by the company innovating of by a company operating in the industry in question. The main characteristics of incremental innovations from a management perspective is that their development fine-tunes already existing competencies. Radical innovations, on the other hand, tend to destroy and render obsolete existing competencies of a company and are fruit of complex innovation processes that can stem from the identification, perception and articulation of an unsatisfied or latent need of society, the desire of a company to develop a product or service that does not exist in the market, the desire to take advantage of a newly developed and/ or available technology, or the desire to conquer a new and undiscovered market segment.



Tushman's dynamic cycles of innovation

Moving from the common nomenclature associated to innovation to the idea that innovation and new product development are iterative process, we would like to emphasize the fact that innovations are bound to evolve over time. In particular, it is important to understand that regardless the innovation (be it technologically oriented, market oriented or design oriented), they all evolve in what seems to be a very typical S-curve characterized by four main stages of development from the initial introduction of the innovation onto the market through to its growth and maturity phases up to its inevitable decline and exit from the market.

In its early stages of industrial development, product designs are considered "fluid", while manufacturing processes are loosely organized and competition manifest itself in terms of designs that are markedly different from one another." The next two phases are characterized by a focus on the most stable and promising designs that have emerged victorious in the race towards the development of a dominant architecture and design, which, once established, pushes competition to shift more towards process innovation where scale and learning become the dominant variables that make the difference, and where capital investments become more common as companies seek to lower unit costs by exploiting economies of scale and learning. In fact, this shift to a set of more industrial/productive variables allows companies to amortize investments associated with the development of new dominant products. As such, in these phases of growth and maturity, innovation switches from being product oriented to process oriented. Moreover, as the product matures, so do the performance characteristics of the products that are on the market. In so doing, consumers tend not only to look at the mere functional performance of the products they are purchasing, but also at the significance or semantic meaning that the products have embedded within their design, their company brand, and their level of critical acclaim from both an industry and consumer perspective.

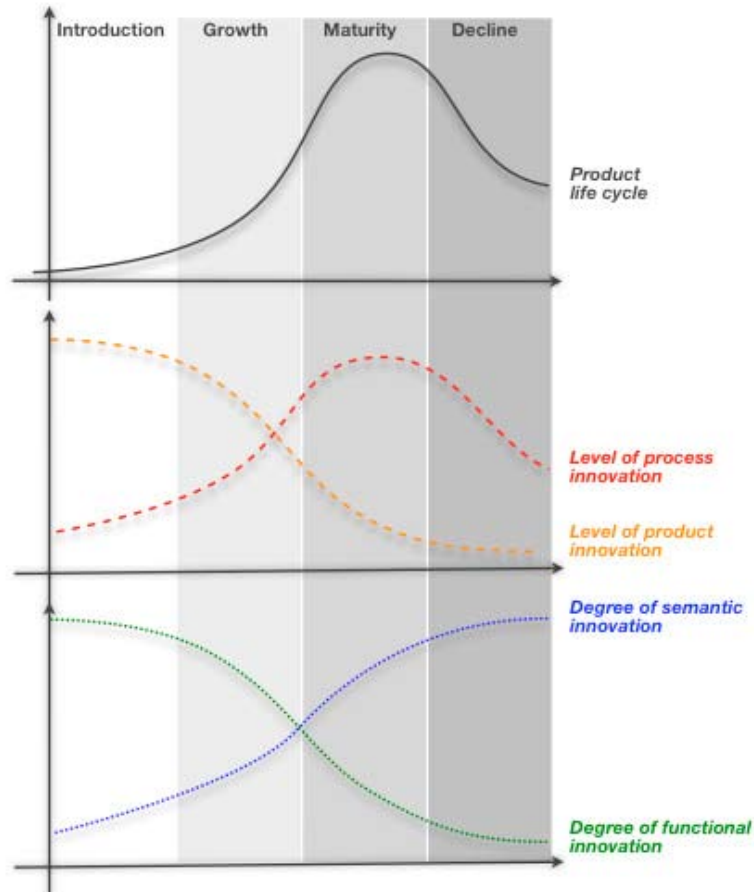


Figure 1: Innovation dynamics
Alessio Marchesi - 2005 Business classics:
Managing innovation through product longevity

Consequently, these sets of variables that range from process and product innovations, functional and semantic innovation and the natural life cycle of products brings for the possibility in the industry for continuous cycles of innovation that can be characterized in what is considered the dynamic cycles of innovation illustrated in the figure 2 below.

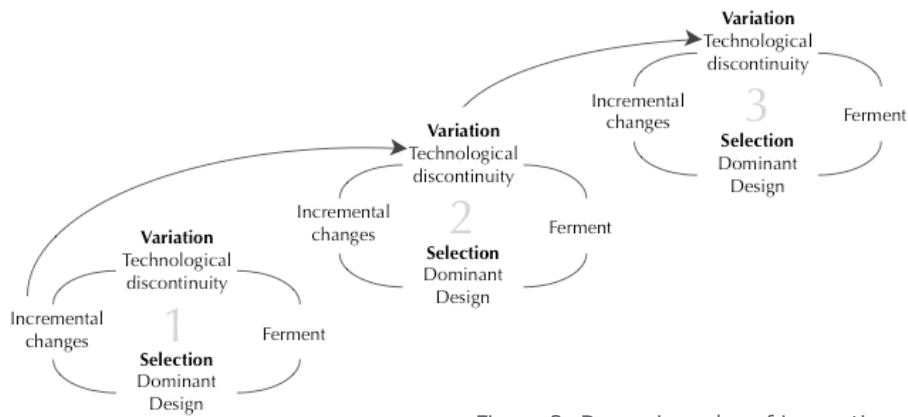


Figure 2: Dynamic cycles of innovation
 Tushman M and O'Reilly C., *Winning through Innovation*. Harvard Business School Press, Boston MA. 1997

In this approach to looking at innovation, we can understand the reasons why it is important for a company to continuously invest in innovation be it technologically-pushed innovation, market-pulled innovation or design-driven innovation. Regardless the approach that a company has, it is important for a company to have a vision as to where it will be investing in the future in terms of technologies, understanding user needs and requirements and design. This aspect of innovation will be further discussed in the next section of this manual that will focus on defining innovation strategies that companies can adopt in order to manage and develop innovative product systems.



3. Approaching innovation

For Innovation to become a competitive factor to better compete in today's globalized economy implies not only a deep understanding of the principles and nomenclatures associated to innovation, but also a deep understanding as to the direction that a company can take in developing its approach to innovation. This part of the manual is therefore targeted to give its readers a better understanding as to the different approaches that companies can take in managing innovation. In particular, what is interesting to note is that we can define three macro categories or approaches to innovation under which the majority of companies operating in the furniture industry can fall into. These macro categories, whose hearts lie in the definitions of innovation described in part 1 of this manual are (1) Technology pushed approach to innovation; (2) Market-pulled approach to innovation and (3) Design-driven approach to innovation.

Technology-pushed approach to innovation

In short, technology-pushed innovations are innovations that rely primarily on the development of technological and scientific knowledge to drive the innovation and new product development process forward. In particular, it means that companies must invest resources in various activities in order to accomplish the objectives of developing breakthrough product/process innovations so as to develop the most promising portfolio of innovations that can guide towards the development of dominant product lines.

What this means is that the company must formulate a technology strategy that they can follow. To do this, it implies that the company must (1) Choose the technological activities to invest in; (2) Allocate the necessary resources to undertake the above mentioned activities; (3) Develop the infrastructure that can allow for the development and maintenance of the technological choices made for both the short-term and long-term. Translated, this means that the company must:

1. Identify the key technologies for the company in terms of product technology, product architecture, and process technology in order to define the strategic orientation (timing) of the technological investments to be made;
2. Identify the sources of innovation for the company.

Identify key technologies (What is, what will be, and what the company currently knows). In this phase in adopting a technology pushed approach to innovation, the objective of the company is to identify a range of existing and emerging technologies that are appropriate for the industry sector within which they compete. (I.e. Kitchens, bedrooms, upholstery, chairs, illumination etc). To accomplish this, there are a range of methods and tools that can be adopted. The most common being the development of a technological roadmap to innovation that implies conducting an external analysis of what is and what will be in terms of technologies, and an internal audit to identify the current competencies, skills, resources and budgets allocated to the development of technologies.

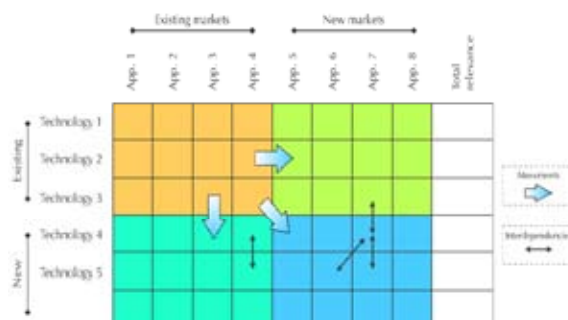


Figure 3: Technology application matrix

Hence, the first step in conducting a technological roadmap to innovation is to identify the emerging, pacing, key and base technologies and pitch them against the possible market opportunities the company is facing. In so doing, the company is not only able to understand how technologies are evolving, but also the importance that each type of technology (be it product or process technology) has on the potential evolution of the market.

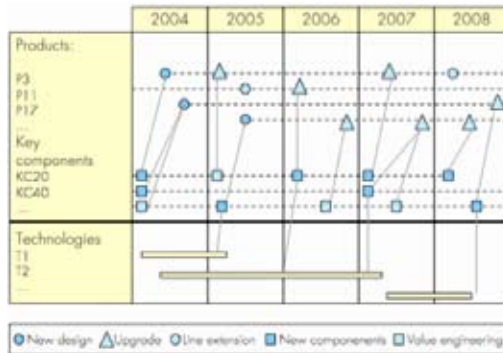


Figure 4: Bill of technologies

The next step is to then analyze how each type of technology is associated with the current and future company product portfolio by tracing how each typology of technology is embedded within each company product. A sort of bill of technologies that can be used in conjunction with the technology scanning to evaluate the strategic relevance and company positioning for each type of technology. An analysis that merges the external technological analysis with the internal audit of competencies, skills, resources and budgets that the company is investing, which form the basis for the development of a technology roadmap that tries to map the future investments the company will make according to the forecasted technological and market evolutions.

Competitive Position	Competitive Impact			
	Emerging	Pacing	Key	Base
Clear leader	Future competitive advantage		Present competitive advantage	Alarm signal for waste of resource
Strong	Future competitive advantage		Present competitive advantage	Alarm signal for waste of resource
Favorable	Industry average			
Tenable	Alarm signal for future		Alarm signal for present	Alarm signal for survival
Weak	Alarm signal for future		Alarm signal for present	Alarm signal for survival

Figure 5: Technology scanning

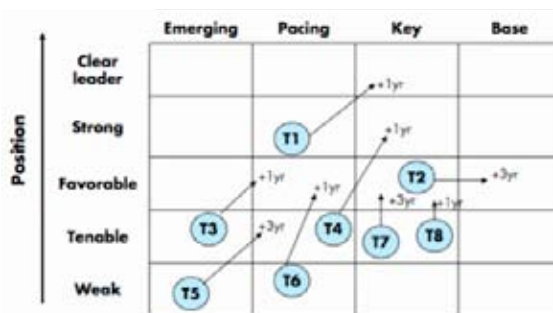


Figure 6: Technology roadmap



But, what does it mean for a technology to be strategically relevant for a company? In essence, the more a technology

- Contributes to the creation of value for the company (be it economic, social or cultural);
- Can be applicable in a wide range of applications or markets that are important to the company;
- Cannot be appropriable by the competition (cannot be copied or obtained through acquisition or outsourcing), the more strategic it is from a company perspective.

Identifying the key sources of innovation: Once the company has determined both the strategic relevance of technologies and their positioning within this evolutionary roadmap to innovation, the next step for a company willing to invest in this approach to innovation is to identify and decide upon what key sources of technological innovation are needed to obtain the positioning. This implies making a decision in terms of what to make and what to buy, or what to develop internally (by investing in new competencies, know-how and machinery etc.), what to develop externally, and finally what to develop in partnership with other entities etc.

Market-pulled approach to innovation

This approach to innovation implies a deep understanding of user needs. In fact, using this approach, innovations start directly from the analysis of user needs, which are then used to search for the technologies and product languages that can be used to better satisfy these identified consumers needs. We include user-centered innovation as a declination of this approach to innovation since it also starts from analyzing users to directly or indirectly identify directions for innovation. Although the user centered approach is more advanced and sophisticated (its methodologies allow companies to better understand why and how people give meaning to existing things), it still remains a market-pulled innovation as the degree of innovation lies within the realm of existing socio-cultural regimes and technological paradigms.

What this means is that the company that wants to adopt this approach to innovation must develop the necessary skills and methods that are needed to better understand user needs and expectations. In fact, it means that they must :

1. Understand the difference between explicit and latent needs of a consumer and how this can impact the innovation and new product development process;
2. Know how to gather knowledge related to explicit and latent needs of the consumer;
3. Know how to translate this knowledge into product/service specifications that can enable the company to develop user-centered or market-pulled innovation.

What are consumer explicit and latent needs? To understand what explicit and latent user needs are, and the difference between them, we rely on the distinction between understanding what people say, what people do and what people make. If we were to consider them on a continuum, we could say that what people say and what people make are at the extremities of this continuum, where what people say implies getting an understanding as to what people explicitly state they want from a product or service, and what people make are truly the needs that users are either unable to express, or are unaware they have. In other words, what people say implies asking people through questionnaires, interviews and other quantitative methods of analysis explicit questions related to their current degree of fulfillment and satisfaction of their current needs on behalf of the existing product offering(s).

As figure 7 illustrates, this means that the types of innovations, and hence the type of competitive advantage that a company can have is limited to be incremental by nature as it implies analyzing the explicit needs users have. If we move more towards the other extremity towards what people do, we can see that companies adopting methods such as focus groups and ethnographic research are able to not only gather explicit needs, as these are embedded within consumer behavior, but also observable and often also tacit needs that are only observable through the natural observation of how people interact with the products and services that companies offer. Consequently, the types of innovations that can be generated by looking at what people do are of greater significance as this implies discovering new needs that are hidden within consumer behavior.

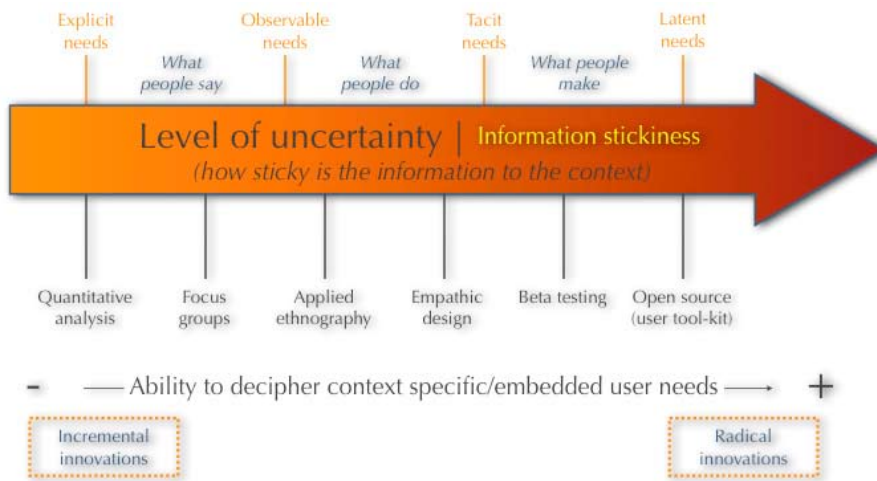


Figure 7: User needs analysis

Finally, if we move towards understanding what people make and dream, this implies truly involving the user throughout the entire new product development process. In fact, it implies co-designing with the various stakeholders that come into contact with the company. In doing so, the company is able not only to understand (1) the explicit needs embedded within the behavior of the user, (2) the observable and tacit needs embedded within the context-of-use and behaviors of the user using the product, but also (3) the notion that the user is a dynamic part of the development of the context within which he/she lives, and hence is able to subconsciously change or innovate the context in very subtle ways that can eventually create ripples throughout the underlying socio-cultural and technological context: the heart in which radical innovations lies.

What does it mean to conduct user needs analyses? As briefly mentioned in the above sections, the focus of the market-driven or user-centered approach to innovation is to base innovations on the detailed knowledge of a consumer's needs. Hence, at the heart of this approach to innovation lies a company's ability to choose and conduct the right types of analyses at the right time and with the right attention. Hence, it implies gathering information using the most appropriate methods and tools associated with the type of innovation, the type of market, the characteristics of the company's NPD process (timing, quality, costs etc), and, finally, the consumer's context.



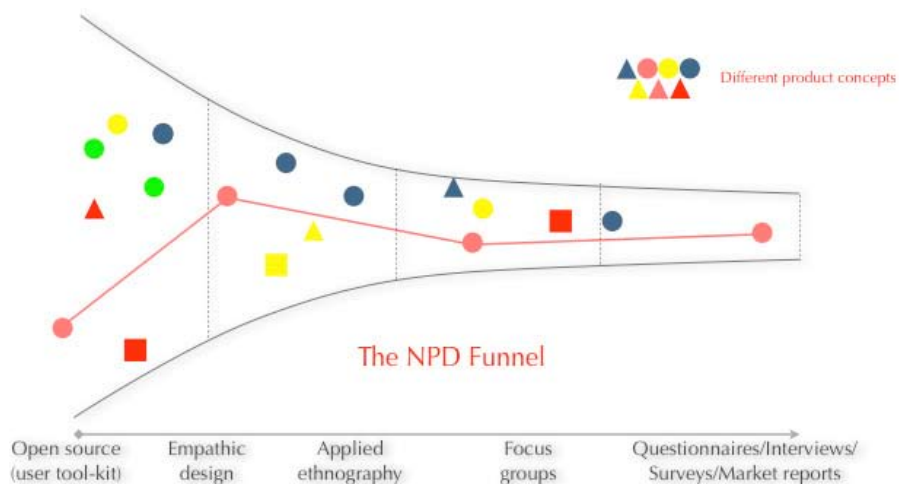


Figure 8: NPD funnel and user needs analysis methods

A good rule of thumb related to conducting user needs analyses is depicted in the figure 8 above. In this figure, we can see that the earlier on in the new product development process (and hence in the opportunity funnel), we are, the more exploratory the types of user needs analyses can and should be. Hence, looking at figure x, this means that companies should adopt more qualitative methodology in order to gain a deep and exploratory understanding of what potential user needs are. In fact, the main objective for companies whose products are in the early phases of the new product development process is to gain as much insight as possible into what people do, make and dream. Conversely, the more downstream you are in the new product development process, the more validating (and hence quantitative) the methods should be. This is primarily due to the fact that in the latter phases of the new product development process, the company has already made design decisions that have conditioned and fixed many of the product/service characteristics of the product that is being developed, and hence are in need of a validation of the decisions previously agreed upon.

How can I translate this user-centered knowledge into products and/or services? Once a company has identified the explicit, observable, tacit and latent needs of users, the next step in adopting a user-centered approach to innovation is to understand how to translate this gathered user-centered knowledge into products and services. To accomplish this, a company must:

1. Understand the context that it is willing to innovate. What this means is that, based on the degree of innovation the company is willing to generate (incremental vs radical), the company must conduct an internal analysis to understand how this type of innovation etc. will impact the company's internal structure in terms of costs, resources and timing;
2. Prioritize the needs that the company is willing to satisfy on the basis of (1) the conducted internal analysis and (2) an external analysis geared to forecast how the user needs will evolve over time in the light of the fact that these needs may be satisfied by either competing or substitute products.

To accomplish this, there are several methods and tools that a company can adopt in order to translate needs into product performance characteristics. In particular, the quality function deployment methodology is one of the most widespread methods that is able to (1) support companies in structuring customer requirements (user needs) in a logical and intuitive manner, and (2) support companies translate these customer requirements into engineering characteristics. In doing so, the company is then able to quantify the degree of fulfillment of customer requirements on an investment basis. In fact, using such a structured approach to translating user needs into product characteristics, the company is able to better articulate the decisions and trade-offs made in terms of satisfying customer needs.

Another widely consolidated theoretical methodology that can support companies in this phase of translating user needs into product characteristics is Kano's model of customer satisfaction. In particular, what is interesting about this model is that Kano classifies a product features pitching customer satisfaction against degree of fulfillment. In particular, he distinguishes product features between:

- Must haves: Product features that the consumer expects, and if not present are dissatisfied with the product.
- Linear performers: Product features that proportional to customer satisfaction. In other words, customer satisfaction increases as the degree of fulfillment of that specific need increases;
- Delighters: Product features that if not present do not infringe upon customer satisfaction of the overall product, but if present exponentially increase customer satisfaction as degree of fulfillment increases;
- Indifferent quality elements: Product features that customers are indifferent to. In other words, if they are present/not present, they do not impact overall customer satisfaction;
- Reverse quality elements: Product features whose presence annoys customers to the point that the more they are present, the less satisfied the customer will be.

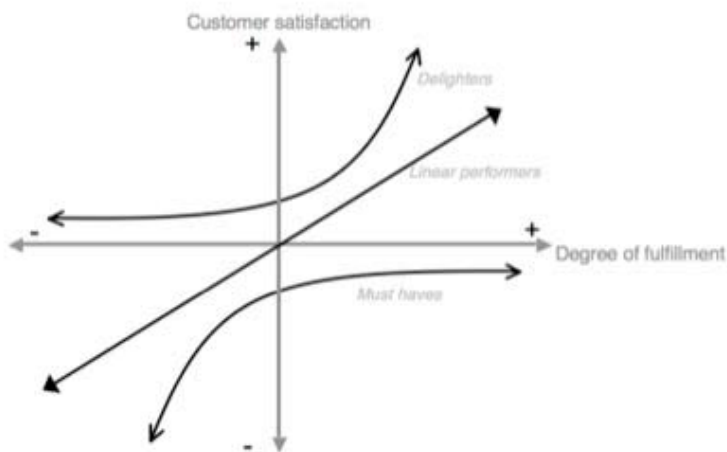


Figure 9: Kano's model of customer satisfaction

Consequently, adopting a user-centered or market-pulled approach innovation implies navigating through this world of user needs in the most appropriate manner, trying to avoid indifferent and reverse quality elements while maximizing on linear performers and delighter product features and maintaining must have product features. Of course, the true user-centered or market-pulled companies also understand that Kano's model evolves over time (Delighters over time become linear satisfiers and then must haves) and consequently, their quest is to always try and understand what are going to be the future delighters in their product category.



Design-driven approach to innovation

To better understand the principles of design driven innovation, it is necessary to introduce the product-system diagram that interprets a product through the use of three distinct levels: the tools, which make up the different parts of a product, the results, which connote the workings of the product and the effectiveness, which defines the performance characteristics of the developed product. This is illustrated more clearly in the figure X. If we look at this model from a technological perspective, as often happens when talking about product innovation, we can see that these three levels assume the well-consolidated meanings of technologies, functions and performances. A lamp, for instance, can be read in terms of its underlying technologies (optics, sources, materials, control-systems, pressing-system, etc.), its functionalities (to light in a diffuse or concentrated manner, to control the light source, to limit the current consumption rate and heat emission, or to orient the lamp on different axes, etc.), and its performances characteristics (degrees of movement of the lamp, the efficient use of power, control precision, the tonality of light, the degree of illumination, etc.).

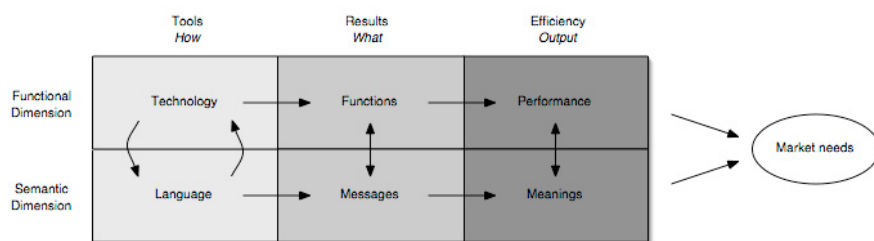


Figure 10: The dimensions of the product system
Zurlo, F., Cagliano, R., Simonelli, G., & Verganti, R., *Innovare con il design: Il caso del settore dell'illuminazione in Italia. Il Sole 24 Ore, 2002.*

Typically, this type of distinction is what lead companies to define product specifications, and hence can be considered the main functional and performance characteristics used to compete on the market place. Moreover, these characteristics are also the typically parameters that consumers uses to rated the quality and innovativeness of a product. Thus, to innovate means to develop product or process technologies that either allow the company to (1) develop new functionalities, (2)improve performance of existing functionalities, and (3) introduce new uses for the product in question: all this to better satisfy consumer needs.

These viewpoint, however neglects (or considered only in a marginal manner) a second product dimension, the symbolic and/or semantic dimension that constitutes a central and inevitable aspect of design driven innovation. This second dimension is illustrated in the lower part of figure 10, and mirrors the distinctions made in terms of technologies, functionalities and performances. In fact, instead of technologies, we talk about product language, instead of functionality, we speak about a product's messages and finally, instead of performance, we intend a product's meanings. Consequently, a product not only carries out specific functions, but it also transfers specific messages that contribute to defining a specific meaning that a customer can give a product.



Consequently, as illustrated in figure 11, the three types of approaches to innovation lead to different degrees of innovation. Put in another way, technology-pushed innovation, market-pulled innovation, and design-driven innovation all have different focuses. While, as described in the previous sections of part 2 of this manual, technology-pushed approach to innovation focuses on the development of technologically-driven innovations that are based on scientific and theoretical advances in applied sciences, and market-pulled approach to innovation focuses on a deep understanding of user needs, the design-driven approach to innovation focuses on research and development activities related to the scientific and artistic dimension of product languages, messages and meanings.

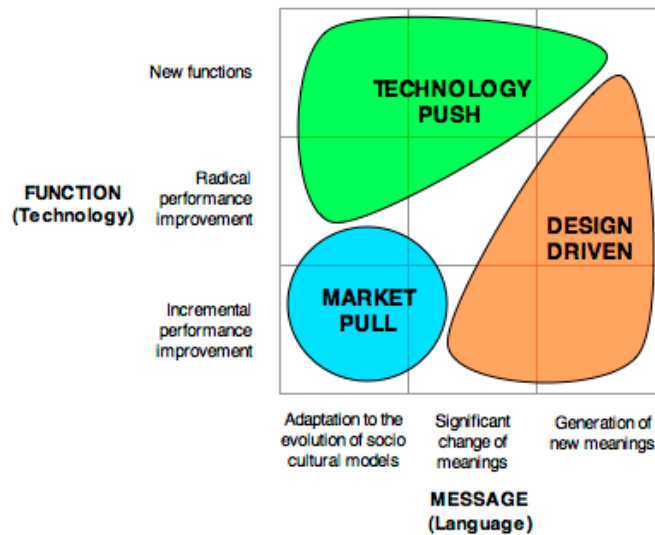


Figure 11: Dynamics of design driven innovation
Roberto Verganti, *Design Driven Innovation* (Boston: MA; Harvard Business School Press), 2008

Consequently, it becomes apparent the relationship that exists between the technology-push and design-driven innovation approaches: while the former acts on the technological level while trying to push forward changes in the socio-cultural context, the latter works on the more abstract interpretive level while moving towards the development of new technologies that support the expression of new meanings. Hence, while in the technology-pushed approach, the driver is the development of new technologies, it is only a means to an end in the design-driven innovation approach in which the driver is development of new meaning or semantics of the resulting product. This concept is better illustrated in figure 12 that highlights the main drivers to the various approaches to innovation.

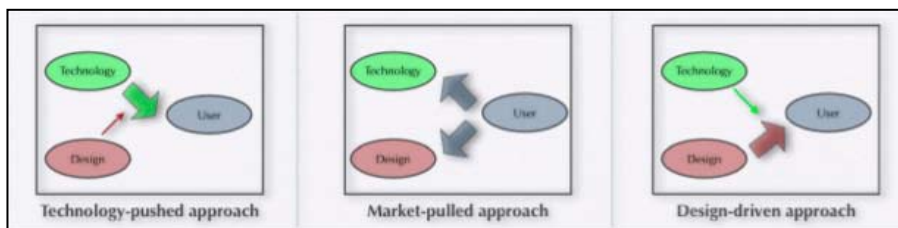


Figure 12: Dynamics of design driven innovation
Roberto Verganti, *Design Driven Innovation* (Boston: MA; Harvard Business School Press), 2008

Consequently, to adopt a design driven approach to innovation, a company must:

1. Develop a deep understanding of what is meant by product languages, messages and meanings;
2. Understand how to identify, capture and interpret emerging trends related to the world of design by being proactive members of design discourses occurring throughout the world;
3. Develop the necessary skills to manage design driven innovation.

What are product languages, messages and meanings?

As illustrated in figure 13, design languages are determined primarily by the morphological and symbolic codes that are used to express the sensory characteristics of a product. Therefore, for a company wanting to adopt a design driven approach to innovation, it is necessary for the company to have a strong understanding as to how a product's sensorial impact on a consumer can change by altering the "semantic" bill of materials of the product. In other words, just as there is a bill of materials that allows a company to identify the various physical components of a product, there is also a semantic bill that can be used to underline the semantic elements of the product. These are traditionally articulated according to the overall architecture, geometric structure, color, surface and material that are used to connote the physical and psychological presence of the product for the consumer who, through his/her 5 senses interacts with the product.

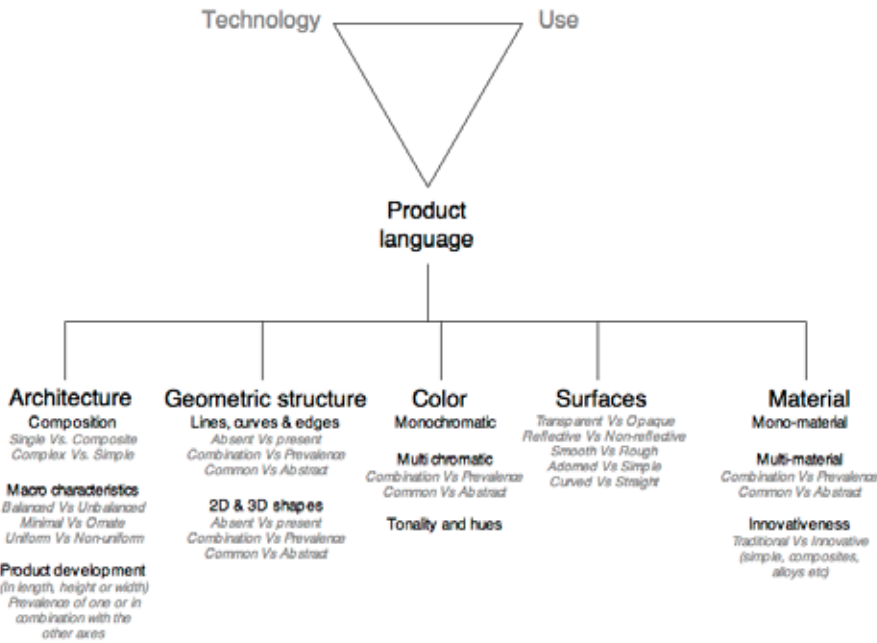
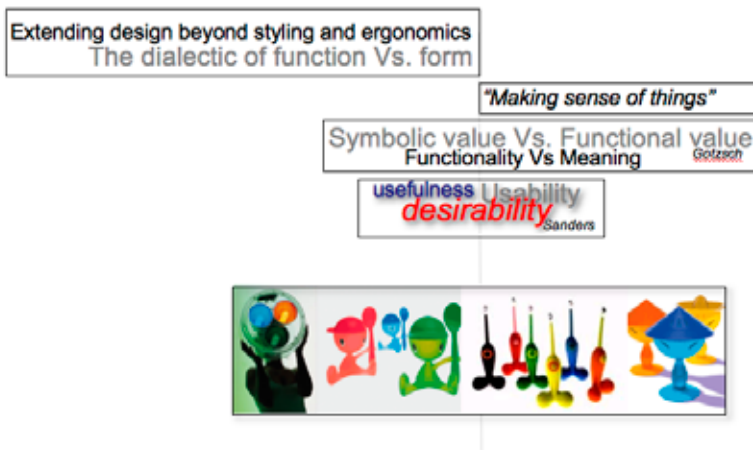


Figure 13: Bill of «Design languages»
Alessio Marchesi - 2005 Business classics: Managing innovation through product longevity

Consequently, a company adopting a design driven approach must have a good understanding as to how to manage these aspects of the development of new product languages in order to develop the most coherent set of messages and meanings with the company's marketing and branding strategies.

In particular, what this implies is that a company, adopting a design driven approach to innovation, must understand that the overall objective of the development of products is to extend beyond the idea that design is only





Design discourses? What are design discourses?

The meaning a user gives to a product depends on his perception and impact it will have on his existence, which in turn is significantly affected by that person's socio-cultural context. Consequently, proposing new product meanings implies an understanding of the inner dynamics of socio-cultural models; it goes beyond what is currently visible. Such knowledge of the subtle and unexpressed dynamics of socio-cultural models is not found in books or in sociological scenarios of the future. Moreover, this knowledge is not codified, but tacit and hidden; it must be researched and developed through a continuous process. Furthermore, this knowledge is also distributed throughout the business environment; there is not a single repository from which it can be retrieved. Hence, the shaping of socio-cultural models and their impact on the interpretation of product languages depends on millions of unpredictable interactions among users, firms, designers, products, communication media, cultural centers, schools, and so on. In other words, this knowledge is diffused within our environment as part of a design discourse: a continuous dialogue on socio-cultural models (foreseen and desired) and their implications on patterns of consumption, meanings, and product languages, occurring through several explicit and tacit interactions among several actors in global, as well as local, settings.

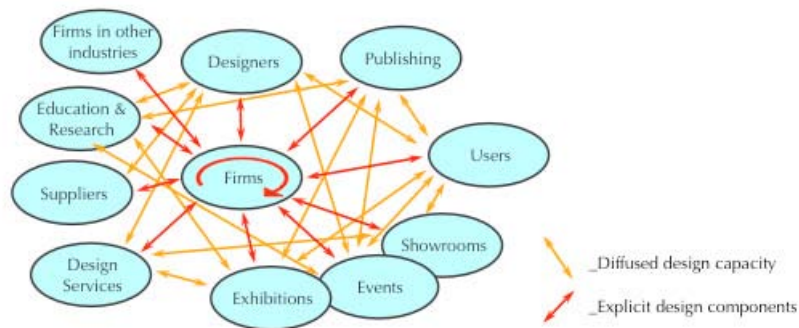


Figure 14: Network of interpreters

Roberto Verganti, Design Driven Innovation (Boston: MA; Harvard Business School Press), 2008

Consequently, a company that wants to adopt a design-driven approach to innovation needs to access knowledge of product languages and the dynamics of socio-cultural models. It may have several channels within which it may access this tacit and distributed knowledge, developing interactions with users, suppliers, other firms, training institutes, and so on. Most of all, however, they must be able to recognize that different professionals can act as focal points in this network of interactions. They are a crucial gate that may give access to the design discourse and to discussions that will shape future product meanings. In other words, they act as gatekeepers in the evolving flow of socio-cultural models. They broker knowledge of design languages.

Consequently, a company must enter into this mentality of managing a network of interpreters that allow them to access both local and global design discourses related to how contemporary and future societies are evolving so as to be able to develop products that are in line with the changing times (both semantically and technologically). This implies opening up the company to many different interpreters and develop innovation in a more "open" manner. It often means outsourcing and/or partnering with many different types of actors. Actors that are not typically considered key within a company context or the typical supply chain of the a company. For example, it may mean developing relations with external designers, editors, publishers, Universities, event managers etc., or it may mean developing these competencies in-house. One thing is for certain though: the design driven company must have the competencies and mentality to render this network useful. Whatever the case, it means being able to create links to worlds that before hand were not considered strategic for the company's new product development ventures.

How can I manage a design driven process?

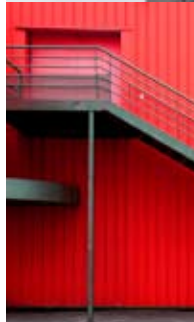
Through our empirical analysis of the furniture sector, the strengths seen in companies adopting a design driven approach to innovation manifest several unique capabilities that make them different from the other companies operating in this industry. In particular, design oriented companies manifest a higher capability to understand trends in cultural models. This is primarily due to two factors:

- Their ability to integrate and be an proactive member of the local context, which inevitably plays an important part in the a company's ability to absorb stimuli from the context as well as be able to influence globally through a networked approach to communication;
- The higher absorptive capacity of the company's managers involved in the new product development process.

Other traits that distinguish design driven companies from other companies in the furniture industry is their higher capability to support DDI with technical innovations. In fact, through their ability to design and manage more flexible and dynamic networks of resources during the entire new product development process, it allows them to easily and more readily recombine and exchange technologies and languages in products. This is also due to their increased willingness to experiment and trial & error. Aspects that also allow them to be open to both technological and semantic R&D activities that are supported by upper management who are also active participants in both local and global discourses that in turn involve a myriad of professionals and interpreters of both the technological and semantic codes of society.

Therefore, how can you manage the design driven process? The following guidelines can help you in changing your mentality towards a more design oriented approach.

1. Adopt a structured interpreter/designer selection activity. In particular, make sure that there is reciprocity in the relationship. Ask yourself, does the relationship add value to all parties involved or is it in some manner unbalanced? The focal point here is balance. Design driven companies are very good at selecting the right mix of interpreters and designers to involve in the development of new products. In particular, they are very good at making the relationship balanced in terms of benefits for everyone.
2. Develop a relationship codification activity: In a design oriented firm, when a project is presented, it is a real pleasure. They love the design activity, they love it with a passion. Having said this, in design driven companies, success occurs primarily because relationships are founded on intelligence, speed culture, friendship, and the will to give pleasure. (Not just the bottom line). This is how the design process should be managed.
3. The NPD team development activity should be a balanced act with the right mix of a heterogeneous, interdisciplinary, internal and external resources involved in the management and development of the products being developed. A mix that is based on the development of a flexible and dynamic network of suppliers, interpreters and internal resources that bring knowledge and expertise to the team.
4. R&D activities regarding the identification and interpretation of socio-cultural and technological trends and market needs must be conducted by every component of the NPD team. Exposure to this type of research activity for everyone is key. It is unthinkable that the designer or the design manager will have the best ideas. It is just impossible and silly to think so. Therefore, the more exposure to these design discourse by everyone, the better off the company will be.
5. Think of design as a strategic resource. The more design oriented companies, in fact, make design a competitive weapon in today's marketplace. Think of design as being a source of innovation capability rather than design capacity. In doing so, you will see that the types of innovations developed will be different.





6. Adopt an editor/author approach to innovation. Since the freedom of action is an important factor driving the innovation process and in attracting the most talented designers, this freedom of action must be connected to the operations and technological capabilities of a firm and its supply chain. However, as an author does not worry about the typing and distribution technologies behind his thoughts and words, the “concept developer” must also not worry about the production and distribution technologies of his/her ideas; this is connected in general to the flexibility of the firm and its network, and in particular to the following factors:

- Strategic orientation and management attitude: Since the firm recognizes the strategic value of the initial concept (often proposed by the designer), it makes all possible efforts to make disappear any technological constraints to the designer;
- Free and applied experimentation: the firm instead must try and increase the designer’s concept potential by proposing new technologies that can enrich the initial idea. It must, therefore, try to provide an experimentation laboratory where it is possible to experiment and test ideas, even when these ideas need to be launched onto the market to be tested.
- Flexible technologies: In order to make the technology component disappear from affecting the initial concept, the production system, distribution system and industrial network should achieve maximum of flexibility.

The project is therefore a natural consequence of this relationship. The role of the “company-editor” is to frame and orient the relationship with the designer. It manages the coherence of the “editorial line” through the role of the manager, who takes care of the portfolio of “designer-authors”, seeing them on a regular basis, stimulating specific interventions, as well as considering their spontaneous propositions.

The role of the “company-editor” instead consists in furnishing the “designer-author” with different concrete solutions in order for the designer-author to “free” his creativity from as many constraints as possible. As an editor the firm is not simply someone who provides “paper and bookshops” (manufacturing and distribution capability) to any “author” (designer or other concept developers); it has to be coherent with its own editorial line (vision and brand). This is important for the following reasons:

Focus: Every concept that complies with the editorial line builds upon previous concepts, and together they sustain the editorial line; they are the incrementally building blocks of a brand. Several concepts that are not aligned with an editorial line are simply confused and send entropic and confused messages to the market, which eventually weakens the linguistic innovative capability of the firm;

- Differentiation: If any designer can work with any company, than what makes a difference to competitors is not simply the designer (who could bring its ideas, designs and knowledge to its competitors), but the combination designer-firm, where the firm brings its own contribution in term of vision, which in turn protects and differentiates it from its competitors;
- Attractiveness: As mentioned above in the section related to designer portfolio management, firms that provide the most knowledge and the best possibilities to learn attract the most talented designers. To do that, a firm must carry out its own research on languages (or at least be able to providing the conditions for several talented designers to meet together and contemplate the design applications).
- The relationship between the manager-editor and designer-author is based on concrete formats such as design briefs, projects steps, company de-briefings, etc. Although these materials do not ensure the success of a given project, they constitute a guidance system, or homing device, for the relationship. Most of the descriptions emerging from the case studies point to very informal relationships.

4. NPD metrics

To understand the effectiveness of your company's innovation strategies implies first assessing the state of your company's new product development process. In particular, it means evaluating the its performance with respect to timing, quality, the costs, and its related resources. Consequently, as previously mentioned, this part of the guide helps you to start thinking about what it means to assess the state of the NPD process and its coherence with the chosen innovation strategies. First of all, as mentioned above, measuring the efficiency and effectiveness of the NPD process with the coherence of the company's innovation strategies implies evaluating three different types of factors: Quality, Time, and Costs (See figure 15). Let's look at these one by one.

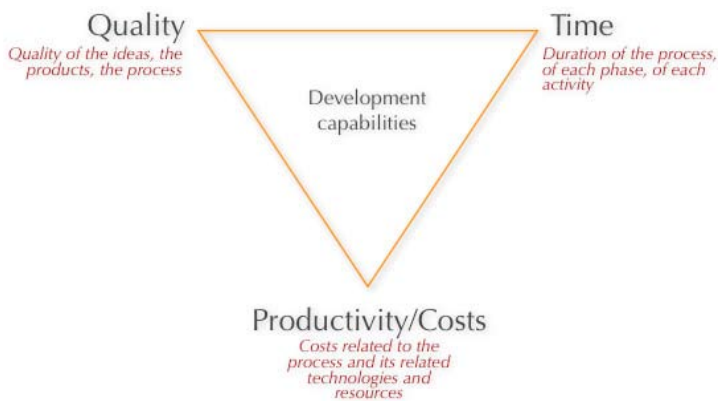
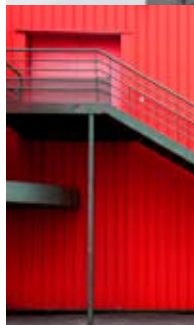


Figure 15: NPD evaluation dimensions

Quality: When we speak about Quality, what is important from a company perspective is to evaluate not only the quality of the resulting product or service that has passed through the new product development process, but also the various work in progress results within the new product development process. In fact, a company, in order to evaluate how well they are faring in product development should evaluate 3 primary factors when it comes to quality:

1. The quality of the ideas that are generated during the entire NPD process. In other words, a company should measure the innovativeness of the ideas and the concepts that are developed during the initial phases of the new product development process. In measuring this, a company can evaluate how radically-oriented or incrementally oriented its personnel working in the NPD process are, and in doing so, can better understand the resulting outputs that are generated from the overall process. Another important variable to measure is the degree of exposure that the NPD department has with respect to the trends that are changing the socio-cultural and technological characteristics of contemporary society. What is meant by exposure? This depends on the industry, but, primarily, it means how "linked in" a company is in its surrounding context. What it outsources and what it tries to measure internally with respect to the changing times. From a more quantifiable perspective, a company should also measure how many ideas are developed (quantity of ideas developed), which measures not only the degree of innovativeness, but also the speed with which its department can generate ideas (the more ideas generated, the higher the probability that one of these ideas can be considered a breakthrough idea. Finally, while innovativeness, exposure and quantity of ideas measure the productivity of the quality of ideas, it is also important to measure the degree to which a company can seize the moment. Does it have the right attitude to be able to capture the innovativeness and quality of ideas or not. In short and in layman's terms, chance favors the prepared mind. Consequently, another element that can help company's understand the quality of the ideas and how well they are understood is by understanding how well structured the NPD process truly is. (The second variable that we will be looking at).



As figure 16 illustrates, measuring the time it takes a company to pass through the entire NPD process implies measuring at least three different concepts of time in NPD terms. In fact, in measuring this, the intent is to benchmark how long it takes the company change with respect to the industry. The first is time to change. In trying to measure this, a company is able to understand how easy or difficult it is for the company to develop radically innovative products. In fact, it tries to measure the time it takes a company to develop a product from the first signs of change in the socio-cultural or technological context. In doing so, the company is able to evaluate how well it is linked into the context, and how well its NPD department is able to identify, capture and interpret weak signals from the socio-cultural and technological context that eventually define the trends of the future. Time to market (or lead time) instead measure the time it takes a company to move through the NPD process once it “officially” starts; in other words, when the company perceives the change and starts the concept generation phase of the new product development process. This is the most commonly measured parameter when it comes to time as it is the most measurable in terms of visibility within the company as it starts with the company allocating a formal budget to the NPD process and it ends with the formal launch of the product onto the marketplace. Finally, the last parameter worth evaluating from a time perspective, is the response time or the time it takes the company to move through the more mechanical phases of the NPD process (from the freezing of the initial concepts to launch).

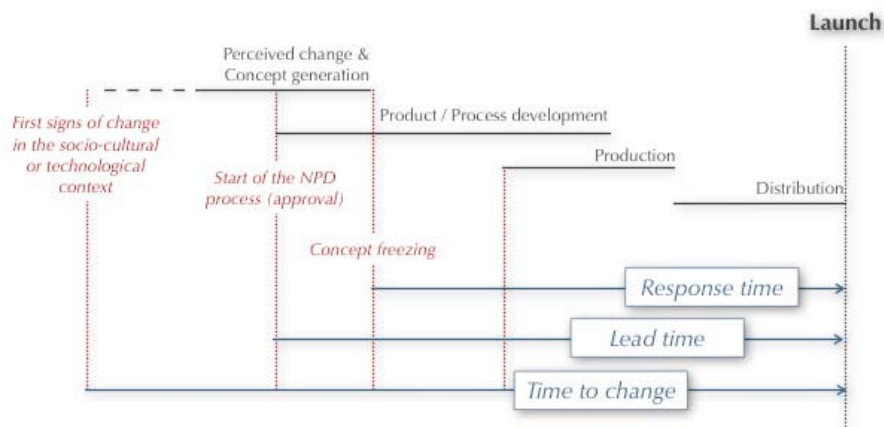


Figure 16: Lead times

What is important to understand is that, while companies primarily focus on measuring the time-to-market of their products, it is also very important to evaluate these other two concepts of time as they are linked not only to the quality of the ideas developed in the NPD process, but also the quality of the process and resulting products.

Productivity/Costs: To complete the NPD metrics that a company should have under control during the development of new products, costs and productivity are the last metrics that must be measured. In particular, what is again important is to not measure the costs or productivity in absolute terms, but relative to (1) the quality of the ideas, process and resulting product and (2) the time it takes the company to develop products. In particular, what is important is to evaluate these costs from different perspectives and evaluate them benchmarking them against industry standards.

The most common metrics that are used to evaluate the performance of the NPD process are summarized in the tables below. In particular, while they consider the above mentioned 3 dimensions (Quality, Time and Cost) they have been divided into criteria that are most commonly considered important for a company. Moreover, they are also important to consider in light of the type of innovation strategies and innovation culture that your company decided to adopt for the development of its products. For more information pertaining to innovation can support you in better structuring your company for the future, please refer to the FIRST’s website, methodologies and tools.





Performance indicators to measure the ability to govern the NPD process
Ratio between the N° of actual and forecasted projects
N° of products ideas that pass the concept generation phase
N° of modifications made to the initial project plan
Degree of change between planned and actual duration of a specific NPD process
Degree of change between planned and actual costs of a specific NPD process
Degree of NPD team satisfaction (Turn-around)
Average break-even point

Performance indicators of the level/degree of product innovation
Average product life cycle
N° of new products developed /year
Average time-to-market
NPD backlog
degree of product innovation (incremental/radical)
degree of substitutability
level of technological innovation

Performance indicators of the quality of the ideas developed during the NPD process
N° of patents/copyrights
Degree of market success of the product concept
Average product life cycle
Radical/Incremental innovation ratio
Degree of imitability of the product concept

Performance indicators to measure the relevance of the NPD process
% of NPD expenditure of overall revenue
Cost of the project / Average product life cycle of the product
Time-to-market / Average product life cycle of the product

Performance indicators of the level/degree of market success
Average market share obtained by new products
Average revenue from new products
Variance in market share related to new products
Variance in market share related to new products
N° of new consumers/markets obtained by new products
Degree of acceptability of the product on behalf of the market & competition

Performance indicators of the perceived quality of the product by the consumer
breadth of the product portfolio
Degree of completeness of the product portfolio
Average time to personalization
Average cost of personalization
Degree of conformity
Reliability
Aesthetics & personality
Maintainability
Availability
Post-sales services
Sustainability
Average product life cycle

Performance indicators of the perceived quality of the product by the company
Revenue/Cost ratio associated to the development of the new product(s)
Time-to-market
N° of modifications made to the product after starting production
N° of new components associated to the development of the new product)

5. References

- Burgelman, Christensen, Wheelwright, Strategic Management of technology and innovation 4th edition, McGraw-hill Irwin NY, 2004;
- Christensen, C., The innovation dilemma. Boston: Harvard Business School Press, 1997;
- Marchesi, A., Business classics: Managing innovation through product longevity (2005);
- Tushman M and O'Reilly C., Winning through Innovation. Harvard Business School Press, Boston MA. 1997;
- Verganti, R., Design Driven Innovation (Boston: MA; Harvard Business School Press), 2008;
- Zurlo, F., Cagliano, R., Simonelli, G., & Verganti, R., Innovare con il design: Il caso del settore dell'illuminazione in Italia. Il Sole 24 Ore, 2002;





Institute of Technology for Furniture
and Related Industry
C\ Benjamin Franklin, 13. Parque Tecnológico.
Apdo. nº 50 - 46980 Paterna. (Valencia)
Spain
Tel : 00 34 96 136 60 70
Fax : 00 34 96 136 61 85
vsales@aidima.es
www.aidima.es



BFM
British Furniture Manufacturers Federation
Wycombe House
9 Amersham Hill
High Wycombe
Bucks HP13 6NR
Great Britain
Tel : 00 44 1494 523021,
Fax : 00 44 1494 474270
info@bfm.org.uk
www.bfm.org.uk



EFBWW
European Federation of Building & Wood Workers
Rue Royale 45/3
1000 Brussels
Belgium
Tel : 00 32 2 2271040
Fax : 00 32 2 2198228
info@efbh.be
www.efbww.org



EIAS
European Industry Associations Services
Rue de la Loi 26
1040 Brussels
Belgium
Tel : 00 32 2 2181889
Fax : 00 32 2 2192701
www.eiasnet.com



IFA
French Furniture Manufacturers Federation
28 bis avenue Daumesnil
75012 Paris
France
Tel : 00 33 1 44 68 18 00
Fax : 00 33 1 44 74 37 55
unifa@mobilier.com
www.mobilier.com



MIP
Piazza Leonardo Da Vinci 32
20133 Milan
Italy
Tel : 00 39 0223992804
Fax : 00 39 0223992720
alessio.marchesi@polimi.it
www.polimi.it



UEA
European Furniture Manufacturers Federation
Rue de la Loi 26
1040 Brussels
Belgium
Tel : 00 32 2 2181889
Fax : 00 32 2 2192701
secretariat@uea.be
www.ueanet.com

FURNITURE INDUSTRY IN RESTRUCTURING : SYSTEMS & TOOLS



Editeur responsable

UEA

Wetstraat 26 rue de la Loi
B-1040 Brussels
Tel. 003222181889
Fax 003222192701
secretariat@uea.be
www.ueanet.com



Co-funded by the EUROPEAN UNION
European Social Fund
Article 6 Innovative measures