

Design integration and organisational routines

Serkan GÜNEŞ

Gazi University, Faculty of Fine Arts, Ankara, TURKEY

Received: November 2010 Final Acceptance: June 2011

Abstract:

For most companies, the main problem concerning new product development is integrating industrial design process in NPD. Although its definition and scope is not noticed fully, increasing importance of design for company is a fact and there are respectable amount of different practices to create a structure for design in the company to support and strengthen the corporate vision and long-term competitive advantage.

Design integration within a firm requires changes in decision rules or routines. As the routine changing processes are themselves routine guided, first, awareness at top management should be constituted for the highest level strategic decision. Selection between developing a new routine itself and adopting an existing one depends on industry type, company size, ownership for design and type of competitive competence, however much of learning in design is imitation of existing ones and vicarious by engaging with consultancies.

On this account, this paper is an attempt to bring insights into this debate first by positioning industrial design in innovation strategy and explicating topic by using different and potential design integration types within various firms. The study interested in explaining different design integration forms, and specifically in understanding what, if any, connections there are between different level of design integration in various firms and organizational routines in innovation management literature.

Keywords: *Innovation, new product development, industrial design, organizational routines.*

Introduction

Can industrial design be routinized and automated like any other industrial work? Does industrial design conflict with scientific management attempts because of its creative, non-routinizable and non-clerical in nature? These conflicting questions are still on the agenda by reason of the nature of design work and its rising importance in marketplace.

As design plays a crucial role in market, it is possible to follow the boom in literature about the ways of integration design in firms' innovation strategies. These studies mainly aims to associate design and its management with overall innovation strategies by focusing successful market cases depending

on design oriented thinking. Many studies are still in lack of proper definition of design; however, this causes inadequate positioning of its scope and zone of influence.

Notable exceptions to this generalization is Verganti (2008), who introduces “design driven innovation” that aims at radically change the emotional and symbolic content of products, through a deep understanding of broader changes in society, culture and technology by filling gap between innovation and design management literature. Yet he specify valuable analogies between design driven innovation and existing theories on radical innovation of technologies by deep analyses of major design driven Italian firms, a guide model for all design conscious or unconscious firms that still remain to be unsolved.

Importance of industrial design

Relevant literature has identified the crucial role of product design in shaping patterns and improvement of competitiveness of products and performance of firms and sectors through innovation. Studies have underlined the positive effect of higher expenditure to innovation performance (Marsili and Salter, 2006) however, empirical studies are still weak to define mechanisms about integrating design abilities within a firm and its impact on developing either original, improved or modified products to improve innovation performance due to difficulties to find consistent definition of industrial and engineering design and their sphere of influence in innovation processes.

Although industrial design has an important role in innovation, its slippery definition and scope still is not noticed fully. Industrial design is generally known and sensed as a final “cosmetic touch” or “something to make products look better” (Verganti, 2008) after research and development (R&D) (Marsili and Salter, 2006) and so, industrial designers are brought into the R&D process at relatively last stage (Veryzer, 2005). Besides, there is still inaccurate information to characterize precise distinction between engineering design and industrial design. Industrial design is the conception and planning the artificial (Buchanan, 1990) that offer a clear advantage for the consumer. Its role is not solely a form giving process contrary to expectations; it is a process of achieving greater consumer satisfaction through ergonomics, functionality, user-product interfaces and aesthetic issues where engineering design first focuses function of the product. It has a strong bound with continuous technological change but it also considers changing preferences of consumers. Understanding the roles of industrial design and its scope in R&D in this context is especially important since radical new products play an important role in building competitive advantage (Veryzer, 2005).

The interplay between innovation and industrial design is fuzzy a ground. Before all else, a better understanding of the most effective roles of design (mostly at product level) in innovation is required (Roy and Riedel, 1997). On this account, first, interconnections between innovation and R&D, R&D with New Product Development (NPD) and NPD with industrial design should be defined.

Innovation, “as new combinations of existing resources, equipment and so on” is a “source of energy” that “disrupts any equilibrium in the economic system” and “propels it from one equilibrium to another” (Schumpeter, 1943).

This transformation is mostly driven by technological competition between firms; however technological type of competition is not limited with new and more efficient machinery previously introduced by Marx. In the literal sense, it encloses development of new and new variants of products, the introduction of new type or qualities of raw materials or intermediate products, the creation or exploitation of new markets or new ways to organize business (Fagarberg and Verspagen, 2002).

Innovation pioneers new innovations or triggers “swarming” imitations (Schumpeter, 1943) and tend to come in bunches to destroy past ones until it provide acceptable economic reward to firms. To guarantee economic reward in cyclic and stabilized periods, mechanized and organized innovation increasingly goes on in groups and organized context, yet the perception of cumulated impact of small routine type innovations may be great (Lundvall, 1992). To facilitate innovations in systematic basis, many organizations invest on research and development (R&D) activities that aim to increase knowledge stock to derive new applications. On this account, R&D became a vital element of the broader knowledge and capability generation process (Nelson and Winter, 1982) to trigger repeated cycles of problem solving (Dosi and Marengo, 1993). In the current highly competitive market, continuous technological change, competitors and changing preferences of consumers, firms are under increasing pressure to develop new products with collaboration of functional areas such as R&D, marketing, production and design. On these grounds, many scholars show an interest in coordination of R&D process and ways to facilitate sharing knowledge across functional areas and mechanism for decision making and conflict resolution for effective and fruitful new product development process.

New product development is an interdisciplinary activity. It is mainly the combination of marketing, design and manufacturing functions of enterprise (Ulrich and Eppinger, 2003). In this context, innovative performance and the successful integration and management of design with other NPD functions is directly linked (Marsili and Salter, 2002). Industrial innovation has become increasingly design-dependent and the advanced market economies cannot compete successfully in global product markets unless they invest in design excellence, design education, and design research (MacPherson and Vanchan, 2010). The integration of design is not just limited with the amount spent on design; it also encloses the ways of improving the competitive advantage through searching and adaptation of appropriate design sources. In the time, with the industrialization of consumer products, industry ganged with pioneer consultant designers at 1930s as outsourcing, after World War II, design profession is absorbed by firms and transformed into a routine business of the formal structure while effectively smothering its innovative energy (Meikle, 2005). The motivation of decreasing product life cycles, permanent technical innovation and dynamic markets, today, “economic competitiveness became an immediate driving force behind the resurgence of design” (Buchanan, 1990).

Positioning industrial design

The goal of industrial organizations is to make profit and to keep on growing. Industrial organizations get this profit through with the products they produce and the services they offer. For long-term survival, industrial organizations have to enter marketplace with superior products (Holland et al., 2000). As products compete in marketplace, market share is affected by such factors

as price, quality, durability and reliability; but at the same time the industrial design factors like appearance, variety and specifications, which exert strong influence on are highly effective on the preference of consumers. On this account the success of industrial design refers to an increase in profitability and commercial benefits (Oakley, 1990; Gorb, 1990).

Design effort is highly related to overall product strategy of organizations in terms of price, focus and differentiation. According to Porter (1990), design can be seen as one of the product positioning tools adding various product features like quality, durability, ease of use, distinctive aesthetics and price. Consequently, industrial design can be defined as a strategic tool for an industrial organization in terms of competitive advantage. The relevant literature locates industrial design within the NPD process. As the NPD concerns the management of the disciplines involved in the development of new products (Trott, 1998), Walsh et al. (1992) positions design in its core, many authors emphasis on its role in a flexible and network type NPD (Pitkonen, 1989; Hyvönnen, 1991; Rasan, 1995; Holland et al., 2000).

After underlining the value of industrial design expertise for survival and competitive advantage, it is better to discuss the ways of introduction of design expertise for product innovation in term of hierarchy of routines.

Firms are assumed to follow heritable and mutable decision rules (or routines). A firm that is unsatisfied with its competitive position begins to “search” for new and more efficient routines and only if the new one is superior, firm adopts it. Searching process can be conducted in two ways; either firm can develop a routine itself or imitate an already existing successful one. Preference between these two ways is characterized by a high degree of Knightian uncertainty of marketplace, bounded rationality of actors, promised economic reward and scale of the firms. There is a great deal of imitation between firms (Dickson,2003) because of the cost rise with innovation; while some large ones tend to develop new routines itself due to their high profit target. On the other hand, according to Nelson and Winter (1982), many organizational routines are quite tacit in nature. Thus the more tacit the firm’s routines, the harder (may well be impossible) it is to imitate by others (Tecee et. al, 1997). Despite this strong “inertia”, changing structure of the firms is conceptualized by hierarchy of routines through highlighting the relationship between strategy, structure and organizational capabilities.

Nelson and Winter determine three type of routines: operating (low-level), investment and search (high-level) routines. Low-level routines refer to daily processes and have short-run characteristic. Investment routines relate to investment decisions and direct grow capabilities. Higher ones affect strategic decisions and ability to ‘search’ out ways of improving lower order routines. Dickson (2003) introduced hierarchy of organization as coherent where operational routines are nested within system control routines, which are nested within resource deployment (investment) routines that are nested within organization learning routines. He argued that newly introduced system control routines are a special case of standard operating (control) routines. In general sense, hierarchy of routines are defined a key construct to explain evolving economic change, competitive advantage and continuous improvement.

As the organizational changing processes are themselves routine-guided, introduction of industrial design function can be explained by hierarchy of

routines through its effect on strategy, structure and capabilities of the organization.

Evolving the role of design in new product development has changed dramatically during last century. According to Perks et al. (2005), during the 1800s, design was embedded in the business and the manufacturing techniques of the time and began in earnest during the 1920s – 1950s, driven by customer affluence and demand for stylish, aesthetic products by outsourcing of specialist and consultant designers. Schumpeter identified parallel approach about this era (1943:132):

“For, on the other hand, it is much easier now that it has been in the past to do things that lie outside familiar routine – innovation itself being reduced to routine. Technological process is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways.”

This specialization on design issues gave occasion to design became as a profession in 1960s and many design schools focused on industrial design education in 1970s. In 1980s, the media and business worlds saw design as a placebo for all ills and design consultancies boomed. However economic recession hit much of the world in 1990s and design was perceived as an expensive superlative activity and was brought back into the firm (Perks et al., 2005) (Table 1). Many academic studies about integration of design discipline in NPD are emerged to improve the communication with technical and marketing functions. In 2000s design takes a more strategic role in business processes and played leadership role in the product development process (Von Stamm, 2003).

Table 1. *The evolution of the role of design in new product development (Perks et al., 2005).*

Period	Design Role
1800s	Business-Oriented
1920s-1950s	Specialist
1960s-1970s	Professional
1980s	Brand Dominated
1990s	Sub-process of NPD
Early 2000	NPD Process Leader

Contribution of design function in the company correlates often with the importance and integration of design in the company, but depends also on industry type, company size, ownership for design and type of competitive competence. The “design ladder” (which is developed by the Danish Design Centre) represents four different levels of company based employment of design: non-design, design as styling, design as a process and design as innovation (Table 2). The design ladder is a useful 4-step model for grouping companies' design maturity based on their attitudes towards design. The higher a company is up the ladder, the greater strategic importance design has for the company. This design integration hierarchy shows strong likenesses with hierarchy of routines in terms of “search” that firms, which prefer higher profit through design function, tend to choose best way believed to fit its structure. Higher level of the ladder demand higher level routines (as learning or search routines) where lower level of the ladder can be parried by imitation of rival products (Table 3).

Table 2. Design ladder (D.D.C., 2003).

Level	Design Maturity
4	Design as innovation
3	Design as process
2	Design as styling
1	Non-design

Integration of design function within a firm can be in several ways. First, because of competence advantage and pressure of continuous improvement firms can directly imitate inspiring trendsetter products. However, if the knowledge embedded in product is highly tacit and due to preventive of intellectual property rights direct imitation opportunities may be impossible. On the other hand, imitating original product with minor modifications can somehow eliminate intellectual property rights, thus infringement of intellectual property rights of industrial design is common in business.

Table 3. Design integration hierarchy versus hierarch of routines

Design Ladder Hierarchy (D.D.C, 2003)	Companies' Attitudes Towards Design (D.D.C,2003)	Role of Design in NPD (Perks et al., 2005)	Design Management Requirements	Routines Hierarchy Requirements (Dickson,2003)
Non-Design	Design is a negligible part of product development etc., and any design activities there are fall to professional groups other than designers.	Business Oriented	Conventional Product Management	Organizational Operational Routines
Design as Styling	Design is seen solely as relating to the final physical form of a product. This can be the work of a designer, but is usually created by other employees.	Specialist, Professional, Brand Dominated	Operational Level Design Management	Organizational System Control Routines
Design as a Process	Design is not a result but a method that is integrated early on in the development process. The production outcome requires contributions from a range of specialists.	Sub-process of NPD	Tactical Level Design Management	Organizational Resource Deployment Routines
Design as Innovation	The designer works closely alongside the company's owners/management on a complete or major renewal of its business concept.	NPD Process Leader	Strategic Level Design Management	Organizational Learning Routines

Conscious design integration within a firm can be in three types: (1) To engage on consultant designers as outsourcing, (2) assign the project to the designer working internally (in-house designers) or (3) both.

Many firms, which pick up acquaintance with design for the first time, tend to engage on design consultants. In recent years, however, major industrial firms have started to outsource knowledge-intensive activities in spheres such as research and development (R&D), product design, and engineering (Parker and Anderson, 2002; Lynn and Salzman, 2007). Consultant designers are generally more expensive than hiring in-house employees however engaging on consultant designers may be less expensive in long run. As consultants are experts with an established body of design knowledge and skills, they may involve change routines within the organization with the advantage of not being a member of organization and

not involved in the internal politics. Especially in SME's, design consultancies may even be strategy makers, because of lack of internal design resources. Design skills may disappear in the organizational hierarchies, and in competition with other groups at the workplace, however consultant designer can combine existing technologies in surprising ways (Hargadon and Sutton, 1997) due to absence of bound by the preexisting definitions the organization provides. Successful engagements with design consultants can encourage firms to hire in-house designers and facilitate an in-house design team in NPD process for the further projects. On the other hand, several problems can occur during outsourcing. First, delivering critical information (as know-how resources and tacit knowledge) to external consultant may be limited. It must be remembered that distributing information to the consultant is always somewhat restricted, and details often dispensed in briefs only on an as needed basis (Järvinen and Koskinen, 2001). Second there is always a threat of history-incompatibility responses in the consultancy engagement. Routines of clients and design consultants may differ. At the same time, there may be competition between in-house NPD functions and engaged consultants.

Various, many firms with an in-house team or designers can contract with consultancies for fresh perspectives, to enhance and activate the mutual competition between the consultancy and the representatives of in-house design teams or due to lack of time or specific professional skills inside and differing points of view. This is because there are visual aspects, where the company's in-house designer or design team is often prone to become tunnel-visioned, if certain repeated design-process are in constant use (Järvinen and Koskinen, 2001). Nevertheless, some firms tend to contract with well-known or "star" designers because of increasing importance of international competition not only in manufacturing but also in industrial design to associate brand with design and the designer label. In such a case, in-house designer(s) may participate in the projects, but merely act as intermediaries or coordinating personnel, controlling the actual work of consultancies (Järvinen and Koskinen, 2001) or may refrain due to controversial views to design project.

When design perceived as a strategic asset, many firm internalize it. As the strategic value of design increases, it will rapidly become an in-house phenomenon (Järvinen and Koskinen, 2001). And as it is internalized more, design becomes a standard part (or core) of company practice. Internalization of design as an in-house function provides several benefits. In such a case, organizations do not spend much time to find suitable consultants and transfer the knowledge; nevertheless, in-house design activity enables to secure the sharing and transfer of the critical knowledge (information and know-how) within an organization. In house design teams routinize design activity and this situation promotes relations between NPD functions. Attainable in-house design teams construct a design centered corporate structure. As said before, however, in-house designers' skills may disappear in the organizational hierarchies, and in competition with other groups at the workplace. The less control designers have over their immediate work and the frames that direct their work, the worse they are able to influence production, and promote their core values, whether these are based on applied sciences, or the art world (Järvinen and Koskinen, 2001). On the other hand, in-house design teams become easily tunnel-visioned as they are tied to the structures of the company.

As much recent attention in industrial practice has been centered about which activities a firm should complete for itself and for which it should rely on outside suppliers (Ulrich and Ellison, 2005), there seems a trend to use both in-house and consultant designers to determine what to do in-house versus what to outsource. Both internalization and externalization of such a strategic tool may be ironic in terms of competitive advantage, however such imports currently account for about 35 percent of externalized design expenditures, compared to less than 15 percent ten years ago (MacPherson and Vanchan, 2010). On the other hand, several reasons can be interpreted for this attitude. First, the mutual relation of in-house and outsource produces a greater fusion powered by the technical or creative potential of both internal and external suppliers. This conversational structure triggers learning process for both sides in terms of sharing knowledge and expertise. Nevermore, outsourcing could be motivated by a wide range of factors, including risk sharing agreements, quality considerations, vendor reputation, service delivery speed, cost containment or the presence of internal diseconomies of scope (MacPherson and Vanchan, 2010).

Design-driven firm

Current interest on design elicits the appearance design-oriented firms. This type firms have highest level of design integration to create right environment for communication and set of people for entrepreneurial/creative climate and expertise to bring design driven innovation.

Verganti (2008) defines design as organizational process, a process to get closer to user and their both functional and social-cultural needs. He highlights 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 (Figure 1). However this approach is suitable for Italian firms which include design as a strategic resource and where company and designer form strong alliances for a longtime, but it is weak for particularly smaller and medium-sized companies that lack of innovation process with the capacity to develop more radical ideas with business potential. Similarly, Utterback et al. (2006) introduces Design Inspired Innovation focusing on language (emotional and symbolic value of the product) to achieve success through a high level of socio-cultural fit. These two approaches stress of changing role of design on marketplace correctly but still lack of a satisfactory explanation to surpass both managerial and cultural barriers to integrating design in product innovation.

Chaotic and competitive markets put pressure on firms to be in continuous transition through design driven. However major transformation through a design driven firm type is slow and incremental. This is because; (1) transformation through a design driven needs design awareness and proper managerial and cultural environment within firm and (2) changes in decision rules (routines) of the firm.

General practice for full design integration within a firm begins with awareness on design issues. Unfortunately, it is difficult to suffuse an entire company with the "design mind" yet the employees represent different schools of thought and background (Jevnaker, 2000). According to Jevnaker (2000) this "hidden treasure" (design) can be accessed with the right

combination of corporate design capability, design/business relationships, and constructive design experiences by integration of competencies as a dynamic, rather than linear, process; relationship building for long-term design/business alliances with clients and repeated investments in creative design opportunities for experiencing increasing returns.

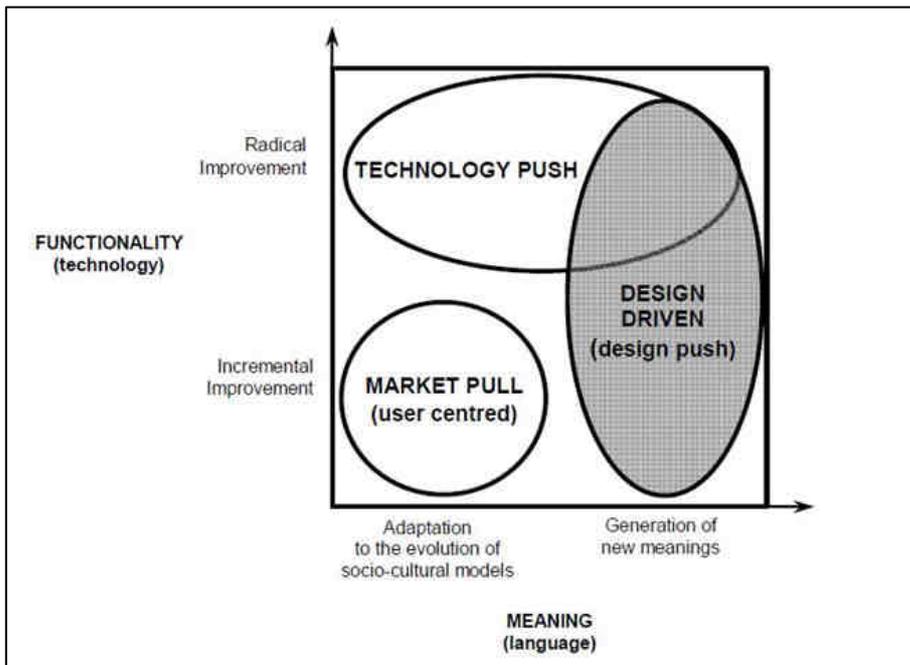


Figure 1. Innovation strategies (Source: Verganti, 1998)

Although markets force firms to be design driven because of competition in Lamarckian sense, first, top management should be consent to integrate design resources. Notable consciousness and promotional efforts are necessary in top management to inculcate design culture in industry at strategic level to align design strategy with corporate. Nevermore, as design process is carried in different industries with different sizes and traditions, it is a multifaceted concept and should be supported by corporate culture and all employees with different responsibilities and backgrounds. So, there should be a collective consciousness and common purpose at all levels of the firm for the sake of satisfactory design integration.

Due to markets, firms are always in transitional nature and searching more efficient routines that best-suited for their eco-environment for long-term and well-qualified survival. Every try -such as to engage on consultant designers as outsourcing, assign the project to the designer working internally (in-house designers) or both- is a search process for the efficient routine, only if one of them by comparison is found to be superior, the firm adopt the new routine (Fagerberg, 2002) until forthcoming conjuncture. Although the changes in routines which are produced in every design integration attempt are normally small, the accumulation of these behavioral changes overtime can cause substantial routines changes in higher hierarchy in a firm, a process that can result in the emergence of design driven innovation.

New design driven firms arise in two ways: either form mutations in routines by itself (search) because of repressive markets, or from the transfer and adopting routines between firms (imitation) and between firms and design

consultants. There is nothing new about the tendency to imitate existing design process based routines, yet developing new design routines are problematic due to tacit, fuzzy and costly nature. So, at the preliminary stage, using design consultants practice has become widespread among firms which prefer higher profit rather than satisfactory one. Occasionally, however, the boundaries between search and imitation on design issues are blurred. This is because outsourcers sometimes may be expensive in long-run, firms tend to facilitate in-house design team due to escalation of costs and restraint of strategic tacit.

Holding these comments in mind, therefore several common types of design integration stick out within firms with a great deal of imitation (Figure 2). Limited number of firms, mainly large ones, directly employ in-house design teams at first (develop a new routine itself), other tend to outsource because of limited expenses. If the performance of in-house teams is found unsatisfactory, firms engage in search of new and more efficient routine: (1) abrogate in house design team and engage with consultant or (2) support in house design team consultants. Further, if consultancy is found effective at first, firms (1) carry on engagement or (2) employ in house design team with the guidance of lessons learned by the previous engagement due to escalation of costs.

Each combination is unique depending on industry type, company size, ownership for design and type of competitive competence, yet it is impossible to determine a general way if and how the design integration ways are applied in the company. What is common is that selections are occurred in deliberate manner and follow the hierarchy of practiced organizational routines. A consistency can be examined between hierarchies of routines and levels of design management levels within a firm (Table 3) where organizational operating routines correspond to operational design management (concerned with managing individual design projects and design teams) (Oakley, 1984; Mozota, 1996); Resource deployment (Dickson, 2003) or investment routines (Nelson and Winter, 1982) match to tactical design management (concerned with organizing design resources and design processes) (Mozota, 1996) and learning (Dickson, 2003) or search routines (Nelson and Winter, 1982) suit to Strategic design management (involving creating the strategic, long-term vision and planning for design and deals with defining the role of design within the company) (Mozota, 1996) .

Many research in design management literature focus on the integration of NPD functions with each other (and also marketing) in an interactive nature. Some propose improved communication between units; others focus enhanced physical arrangements as co-location, a few in rests seek for cross-functional team compositions for a desired integration but most of them failed to draw a general picture yet one size cannot fit all. As the competition based on price shifts towards to competition based on intangibles such as design, branding, research and development (R&D) and embedded or attached services (Bryson 2008), competing solely on price is increasingly impossible; sometimes unnecessary yet price reduction is attainable and common in terms of rational calculations and several managerial revisions. On the other hand, design-based competitiveness depends on firstly and mostly a paradigmatic cultural shift within an organization which sometimes cannot be transferred but learned and also searched by griping pain.

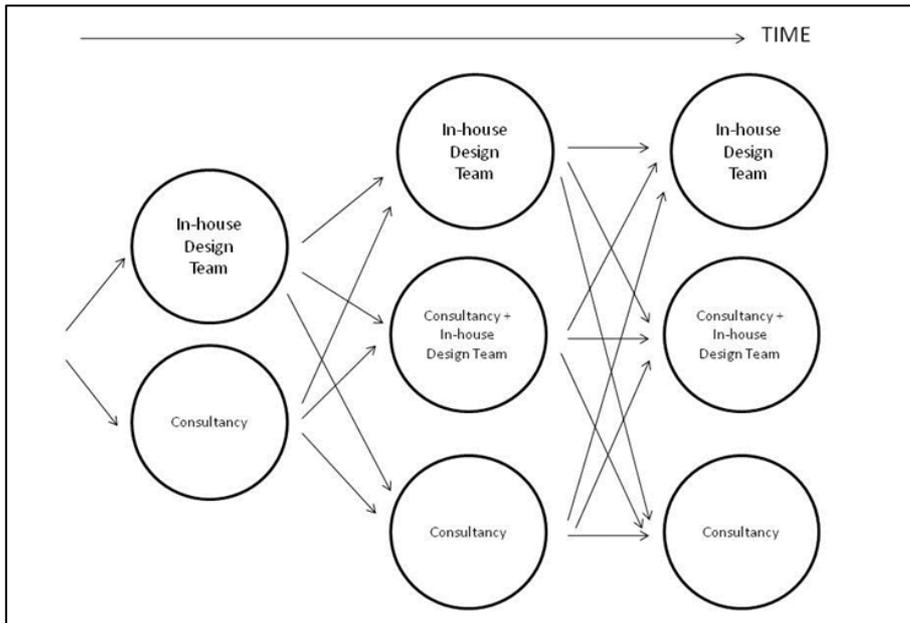


Figure 2. Search for design integration.

Before discussing ways of integration of product design, one should know and care that organization cultural environment is a critical factor not only for functioning design process but also in attracting creative potential that is distributed in business environment. First of all, design needs a climate where it can nurture and a climate that will serve as a magnet for talented ones. As the values describes organization culture and its sub-cultural components, values builds routines, scripts, realizations, perceptions and ideologies in the course of time. By this way, any integration of design whether by outsourcing or internal, first needs arrangements and exchanges on values or may be a complete destruction in archaic depth of thought.

Consequently, design integration based organization, at least at the preliminary stage, can be appear mainly in three ways. First is change in routines where action stems from logic of appropriateness and legitimacy. Second is revision of routines in history dependent and incremental manner to glorify past experiences. Third is target where the behavior depends on the relation between the observed outcomes and the aspirations for those outcomes (Levitt and March, 1988).

As a matter of fact, any fictional change in routines will fail without support of direct experience, so search in the pool of routine alternatives can only give idea; on the other hand learning by doing will help in cumulated production of organizational experience and sui generis tacit despite of its transaction costs.

Conclusion

Design has traditionally been viewed as “something to make products look better” (Verganti, 2008) within an organization rather than as part of a managerial process or a business resource because of lack of understanding of its role and process (Kim and Kang, 2008). However, as complexity of products increases, today, design plays a growing role in improving the competitiveness. Competitiveness through products can be

improved by good product design and product innovation (Roy and Riedel, 1997). Yet the good product design is directly linked with successful product innovation, design services within a firm should be routinized for long-term survival. To cope with complexity and uncertainty in design, design routines should be performed more collective than individual level to ensure strong links between marketing and technology.

It should be emphasized that design integration within a firm occurs only when design based product performance is unsatisfactory. It is important to underline the presumption that firms, which become aware of its importance at strategic level and tend to integrate design services, choose to use consultants at first, only if it by comparison is found to be superior they keep going outsourcing, or employ in-house design team because of increasing costs. There have been many methods about how the design process in firm might be practiced; however, primary objective of this process is to be a design driven firm for long-term survival.

The design integration hierarchy and hierarchy of routines show likenesses in terms of coherency (Table 3). Higher integration needs higher organizational routines where non-design activity can be conducted by lower operational routines without pronounced and embedded design method. On this account, as design needs both sacrifice on investment and expertise, many firms tend to use external design specialist and professional with shared risk and reward, where limited number of them employ in-house teams to go a step further in integration.

Generally speaking, being a design driven firm is a pace up and down process which took on a shape by successes and failures. Every successful step inspires next level at design ladder and requires new managerial infrastructures and organizational routines. Nevertheless, failure also provides “learning” in a strictly logical or technical sense and breed success by re-examining flaws and changing ex-routines.

References

- Buchanan, R. (1990), Myth and Maturity: Toward a New Order in the Decade of Design, **Design Issues**, Vol.6, No.2, 70-80.
- Bryson, J.R. (2008) Value Chains or Commodity Chains As Production Projects And Tasks: Towards A Simple Theory Of Production, in Spath, D. and Ganz, W. (Eds), **The Future of Services: Trends and Perspectives**. Carl Hanser Verlag, Munich, 265–84.
- Dannish Design Center. (2003), **The Economic Effects of Design – Design Ladder Model**.
- Dickson, P.R. (2003), The Pigeon Breeders’ Cup: A Selection on Selection Theory of Economic Evolution, **Journal of Evolutionary Economics**, Vol. 13, 259-280.
- Dosi, G., Marengo, L. (1993), Some Elements of Evolutionary Theory of Organizational Competencies. in R. W England (ed.), **Evolutionary Concepts in Contemporary Economics**. University of Michigan Press, MI
- Fagerberg, J., Verspagen, B. (2002), Technology-Gaps, Innovation-Diffusion and Transformation: An Evolutionary Interpretation. **Research Policy**, Vol.31, 1291-1304.
- Gorb, P. (1990), Design Management. Von Nostrand Reinhold, New York

- Hargadon, A, Sutton, R.I. (1997), Technology Brokering and Innovation in a Product Development Firm, **Administrative Science Quarterly**, Vol. 42, No.4, 716–749.
- Holland, S., Gaston, K., Gomes, J. (2000), Critical Success Factors For Cross-Functional Teamwork in New Product Development, **International Journal of Management Reviews**, Vol. 2, No.3, 231-259.
- Hyvönnen, T. (ed.) (1991), **Product Developments and Design Practice**, University of Industrial Arts Helsinki, Helsinki
- Järvinen, J., Koskinen, I. (2001), **Industrial Design as a Culturally Reflexive Activity in Manufacturing**, University of Art and Design Helsinki, Helsinki
- Jevnaker, B. (2000), How Design Becomes Strategic?, **Design Business Journal**, Vol.11, No.1, 41-47.
- Kim, B.Y., Kang, B.K. (2008), Cross-Functional Cooperation with Design Teams in New Product Development, **International Journal of Design**, Vol. 2, No.3, 43-54.
- Levitt, B., March, J.G. (1988), Organizational Learning, **Annual Review of Sociology**, Vol 14, 319-340.
- Lundvall, B. A. (ed.) (1992), **National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning**, Pinter Publishers, London
- Lynn, L., Salzman, H. (2007), The Real Global Technology Challenge, **Change**, July/August, 9-13.
- MacPherson, A., Vanchan, V. (2010), The Outsourcing of Industrial Design Services by Large US Manufacturing Companies, **International Regional Science Review**, Vol. 33, No.1, 3-30.
- Marsili, O., Salter, A. (2006), The Dark Matter of Innovation: Design and Innovative Performance in Dutch Manufacturing, **Technology Analysis & Strategic Management**, Vol. 18, No.5, 515–534.
- Meikle, J. (2005), **Design in the USA**, Oxford University Press, Oxford
- Mozota, B.D. (1996), **Design Management: Using Design to Build Brand Value and Corporate Innovation**, Allworth Press, New York
- Nelson, R.R., Winter, S.G. (1982), **An Evolutionary Theory of Economic Change**, Harvard University Press, Cambridge
- Oakley, M. (1984), **Managing Product Design**, Weidenfeld and Nicolson, London
- Oakley, M. (ed.) (1990), **Design Management**. Buter and Tanner Ltd, Cambridge
- Parker, G., Anderson, E. (2002), From Buyer to Integrator: Transformation of The Supply Chain Manager in The Vertically Disintegrated Firm, **Production and Operation Management**, Vol.11, No.1, 75-91.
- Perks, H., Cooper, R., Jones, C. (2005), Characterizing the Role of Design in New Product Development: An Empirically Derived Taxonomy, **The Journal of Product Innovation Management**, Vol. 22, 111-127.
- Pitkonen, J., Salminen, J. (1991), Design of Nokia Family Phones, In Hyvönnen, T. (ed.) **Product Development and Design Practice**, University of Industrial Arts Helsinki, Helsinki
- Porter, M.E. (1990), **The Competitive Advantage of Nations**, Free Press, New York
- Rassam, C. (1995), **Design and Corporate Success**, Design Council, UK
- Roy, R., Riedel, J. (1997), Design and Innovation in Successful Product Competition, **Technovation**, Vol.17, No.10, 537-548.

- Schumpeter, J. (1943), **Capitalism, Socialism and Democracy**, Harper, New York
- Teece, D.J., Pisano, G., Schuen, A. (1997), Dynamic Capabilities and Strategic Management, **Strategic Management Journal**, Vol.18, No.7, 509-533.
- Trott, P. (1998), **Innovation Management and New Product Development**, Pearson Education Ltd, Essex
- Ulrich, K.T., Ellison, D. (2005), Beyond Make-Buy: Internalization and Integration of Design and Production, **Production and Operations Management**, Vol.14, No.3, 315-330.
- Ulrich, K.T., Eppinger, S.D. (2003), **Product Design and Development**, McGraw-Hill/Irwin, New York
- Utterback, J.M., Vedin Bengt-Arne, A.E., Ekman, S., Sanderson, S., Tether, B., Verganti, R. (2006), **Design-Inspired Innovation, World Scientific**, New York
- Verganti, R. (2008), Design, Meanings, and Radical Innovation: A Meta-model and a Research Agenda, **Journal of Product Innovation Management**, Vol.25, No.5, 436-456.
- Veryzer, R.W. (2005), The Roles of Marketing and Industrial Design in Discontinuous New Product Development, **Journal of Product Innovation Management**, Vol.22, No.1, 22-41.
- Von Stamm, B. (2003), **Managing Innovation, Design and Creativity**, Wiley & Sons, UK
- Walsh V, Roy R, Bruce M, Potter S (1992) **Winning by design: Technology, product design and international competitiveness**. Blackwell Business, Cambridge

Tasarım bütünleşmesi ve örgütsel rutinler

Tasarım kavramının işletmeler için gerek dikey gerekse yatay ürün farklılaşması bağlamında öneminin giderek artması, klasik fiyat odaklı talep kanunundan farklı olarak rekabetçi üstünlük araçlarından birisi haline dönüşmesini sağlamıştır. Ürün tasarımının bu potansiyelini kullanmak ve ürün tasarım süreçlerinin işletmelerin diğer fonksiyonları ile nasıl ilişkilendirileceği çoğu işletme için bir problem alanı olmakla beraber, firma yapısı, firma algısı, pazar ve ürün çeşitliliği, her işletmeye uyan bir bütünleşme metodunun varlığını engellemektedir. Tasarımın daha ziyade görsel bir unsur olarak algılanması da yeni ürün geliştirme süreçlerindeki konumunun yanlış anlaşılmasına sebep olmaktadır.

Ekonomi kendi içinden yeni mallar, yeni üretim metotları ya da ticari imkânlar sayesinde devamlı olarak yenilenmekte, hareket halinde tutulmaktadır. Bu değişime yabancı kalamayan işletmeler sürekli olarak rekabet baskısını nedeniyle değişime ayak uydurmak zorunda kalmaktadır. Bu nedenle beraber tasarım bütünleşmesi de işletmelerin rutinlerinde değişim gerektirmektedir.

Örgütsel rutin (örgütsel hafıza) kavramı evrimci iktisat geleneğinin uzantısı olarak, Nelson ve Winter tarafından geliştirilmiş, bu model içsel değişmeyi merkeze koyarak; çeşitli biyolojik analogileri kullanarak ve davranışsal firma teorisinden yararlanarak evrimci bir teknoloji gelişme yaklaşımı oluşturmuştur. Modelde sınırlı rasyonallite nedeniyle firmaların rutinlerine göre davrandıkları, mevcut durumlarını korumaya çalıştıkları ancak daha etkin bir konuma geçme arzusuyla yeni rutin arayışına giriştikleri savunulmaktadır. Yeni rutin ise eğer eskisinden daha etkinse uygulamaya konmaktadır. Rutin arayışı belirsizlik içerdiğinden çoğu işletme imitasyonu yeğlemekte, mevcut endüstri rutin havuzdan kendine uygun ve başarılı rutinleri seçmekte, ancak bilginin aktarılabilmesinin sınırlı doğası nedeniyle kimi zaman

imitasyonun yerine firma bünyesinde yapılacak araştırma ve geliştirme faaliyetine bağlı olarak ortaya çıkacak rutinler uygulamaya konmaktadır.

Nelson ve Winter daha sonra rutinler arasında hiyerarşik bir ilişki olduğunu savunmuş, operasyonel rutinlerin firmanın günlük işleri ile bağlantılı olduğunu, yatırım rutinlerinin yatırım kararları ve büyüme kapasiteleri ile ilişkide olduğunu, en üst seviyedeki arama rutinlerinin ise üst yönetimin stratejik kararlarını kapsadıklarını belirtmişlerdir. Hiyerarşi modeli daha sonra Dickson tarafından dörtlü bir sistem şeklinde ele alınmış operasyonel rutinler ile yatırım rutinleri arasına sistem kontrol rutinlerinin varlığını savunmuştur. Hiyerarşik yapılanmada üstteki rutin alttaki rutini etkilerken, örgütteki ciddi değişimler ancak hiyerarşide üst konumda bulunan rutinlerin değişmesi ile mümkün olmaktadır.

Konu bu açıdan ele alındığında tasarım kavramının farklı seviyelerde bir işletmeye nüfuz etmesi ancak farklı rutin değişiklikleri ile olabilmektedir. Kısacası örgütün tasarım faaliyetinin potansiyellerini tam olarak kullanma becerisi ancak hiyerarşide en üst seviyedeki rutin değişiklikleri ve bunların altındaki rutinlerin sırasıyla etkilenmesi ile mümkün olmaktadır. Çalışmada tasarım bütünleşmesi ile örgütsel rutinler arasındaki ilişkiyi ifade edebilmek için öncelikle Danimarka Tasarım Merkezi'nin Tasarım Merdiveni kavramı üzerinden işletmeleri tasarıma karşı tutumları ile Perks'in yeni ürün geliştirme süreçlerinde tasarım rolü değerlendirmeleri Dickson'un rutin hiyerarşisi ile karşılaştırılmıştır. Karşılaştırma neticesinde tasarım bütünleşmesinin farklı rutin değişimi seviyelerine tekabül ettiği belirlenmiştir.

Tasarıma dönük rutin transferlerinde, rutini işletme bünyesinde yaratmak yerine dış kaynak kullanımı (tasarım danışmanlığı gibi), bir bakıma imitasyon, yoğun kullanılmakla beraber çoğu zaman etkin sonuçlar vermekte ancak stratejik bir konuda dışa bağımlılığı arttırmaktadır. Rutini işletme bünyesinde yaratmak ise dışa bağımlılığı azaltmakla beraber yeni maliyetler ortaya çıkarmakta, kimi zaman işletme içi dinamikler nedeniyle vizyon eksikliği yaratmaktadır. Her iki yöntem kullanımı ise iç ve dış kaynakların çatışmasına yol açabilmektedir. Tasarım odaklı bir işletme olmak ise en üst hiyerarşi gerektirmekle beraber, tüm rutinlerde köklü değişikliklere yol açmaktadır.