ANALYSIS OF DESIGN-DRIVEN INNOVATION PRACTICES IN TURKISH AND SWEDISH FURNITURE FIRMS

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ABSTRACT

ANALYSIS OF DESIGN-DRIVEN INNOVATION PRACTICES IN TURKISH AND SWEDISH FURNITURE FIRMS

Aim of the present thesis is to explore and analyze recent practices of design-driven innovation (DDI) in furniture industries of Turkey and Sweden. Despite the large body of literature on innovation as commercialization, there exist several directions in DDI which need to be further explored especially for developing countries like Turkey. In fact, existing studies mostly comprises of the practices of leading design-based companies to further develop the theoretical ground on DDI. By providing insights to the application of DDI theory in developing countries, we aim to enhance the scope of DDI in terms of its drivers affected by design cultures and innovativeness levels of countries. Hence, besides Turkey, this thesis explores the practices of DDI in Sweden as a leading country in terms of its design culture. Differences and commonalities of DDI practices in these countries are analyzed together to define the effects of design culture on DDI. Furniture industry is selected to frame the thesis due to its design focus and ease of application according to other technology based sectors. Through this way, we aim to better compare and contrast the evidences of different countries. An exploratory approach is internalized in which we conduct case study methods to provide evidence to the theory. Semi-structured interviews are realized with designers and designer managers of leading furniture companies of Turkey and Sweden for data enhancement and validation. Through cross-case analysis of national outcomes, we propose additional drivers to DDI theory as product segmentation, activity research, culture research and concept research.

Keywords: Design-driven innovation, innovation strategies, innovation of meanings, research for innovation

ÖZET

TÜRK VE İSVEÇ MOBİLYA FİRMALARINDA TASARIM-ODAKLI İNOVASYON PRATİKLERİNİN ANALİZİ

Bu tezin amacı, Türkiye ve İsveç'teki mobilya firmalarında yakın zamanda geçen tasarım-odaklı inovasyon (TOİ) uygulamalarını incelemek ve analiz etmektir. Literatürde Ticarileştirme anlamındaki inovasyon üzerine yazılmış geniş yayınlar bulunmasına rağmen, özellikle Türkiye gibi gelişmekte olan ülkeler için TOİ'de daha fazla incelenmesi gereken çeşitli yönler bulunmaktadır. Aslında, mevcut çalışmalar çoğunlukla önde gelen tasarım-odaklı firmaların, TOİ'deki teorik temelin daha çok geliştirilmesine yönelik pratiklerini içermektedir. Gelişmekte olan ülkelerdeki uygulama örnekleri sağlayarak TOİ'nin kapsamını, ülkelerin tasarım kültürleri ve inovasyon düzeyleri ve TOİ pratiklerine etkileri bazında genişletmeyi amaçlamaktayız. Dolayısıyla, bu tez Türkiye'nin dışında, tasarım kültüründe önde gelen bir ülke olan İsveç'teki TOİ pratiklerini de araştırmaktadır. Bu ülkelerde TOİ'deki farklılıklar ve ortak özellikler, tasarım kültürünün TOİ üzerindeki etkisini tanımlayabilmek için birlikte analiz edilip değerlendirilmiştir. Mobilya endüstrisi, tasarım odağı ve diğer teknoloji bazlı sektörlere kıyasla uygulamadaki kolaylığı bakımından teze bir çerçeve oluşturması amacıyla seçilmiştir. Bu şekilde, farklı ülkelerden bulguları daha iyi kıyaslamak ve karşılaştırmak amaçlanmıştır. Teoriye kanıt sağlaması açısından, örneklem çalışması ile yürüttüğümüz keşifçi bir yaklaşım içselleştirilmiştir. Türkiye'nin ve İsveç'in önde gelen mobilya firmalarından tasarımcılar ve tasarım yöneticileri ile veri iyileştirme ve doğrulama maksatlı yarı planlanmış röportajlar gerçekleştirilmiştir. Ulusal çıktıların çapraz analizi vasıtasıyla TOİ teorisine, ürün segmentasyonu, etkinlik araştırması, kültür araştırması ve kavram araştırması gibi ek güdümler teklif etmekteyiz.

Anahtar Kelimeler: Tasarım-odaklı inovasyon, inovasyon stratejileri, anlam inovasyonu, inovasyon araştırmaları

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LIST OF ABBREVIATIONS

EU	European Union
DDI	Design-Driven Innovation
NPD	New Product Development
OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
TUIK	Turkish Statistical Institute

CHAPTER 1

INTRODUCTION

1.1. Problem Definition

This thesis focuses on the analysis of design-driven innovation (DDI) practices in Turkish and Swedish furniture industries via case studies from both countries. The literature about DDI is mostly focused on global market leaders as to be the cases for exploration of the theory in practice. There are also some studies about DDI practices in emerging countries (i.e. China, Indonesia, and Greek) but the studies in Turkey are not necessary for the exploration of design and innovation concepts. In addition, there is no study about DDI practices in Turkish furniture industry although it is one of the most prominent sectors for design.

Innovation is the key feature of competitiveness for any kind of business. In a growing world of economies and technologies, the significance of innovation for competitiveness is gaining importance around all over the global world. Porter (1998a) considers innovation as one of the most repressive elements of competitive advantage. The survival of the companies is dependent to innovation (Goyal & Pitt, 2007).

Not only technological innovations but also design innovations are gaining importance increasingly when to compete in the global marketplace (Sun & Lee, 2013). In today's global marketplace, firm's success and survival rest on product innovations (Lee & Zhou, 2012; Rubera & Kirca, 2012). Rubera and Kirca (2012) states that product innovations, independent from its novelty degree, have a positive effect on firm value via market share increase.

Besides above implications, there are emerging economies like Brazil, China and India by which researchers (e. g., Atuahene-Gima & Murray, 2007; Khavul, Peterson, Mullens, & Rasheed, 2010; Lee, 2010; Lee & Zhou, 2012) are attracted to study on innovations those countries provided. Yu et al (2013) states that innovation is especially important for emerging Asian countries which are currently appeal to strategic transformation. Daniela et al (2014) states about Turkey that "the Expected Incremental GDP in the next 10 years to be larger than the average of the G7 economies, excluding the US countries" since Turkey is listed as an *emerging economy* and *market* (Albo,

Díaz, & Ng, 2012; Cadenas, Martínez , Ugarte, & Rodrigo, 2014; Jones, 2012) in BBVA-EAGLEs and Dow Jones indexes. Furthermore, it is specified as an; *advanced emerging economy* (FTSE, 2015a, 2015b), *emerging-market economy* in *E11* list (BOAO, 2014) and as an emerging economy in *G20* list in terms of various criteria.

Through the above statements and reports stating Turkey as in G20 list, it is expected that there is an increase in innovation activities in Turkey. In fact, innovation in Turkey has been gaining importance as we can see from the news of activities on the internet about innovation including seminars, workshops, meetings, fairs and trainings. Furthermore, governmental support for innovation activities increased by introduction of new support programs by TUBİTAK (The Scientific and Technological Research Council of Turkey), KOSGEB (Small and Medium Enterprises Development Organization), Kalkınma Bakanlığı (Ministry of Development) and several other intuitions. Former president of Turkey, Gül (2011) states 'I believe that innovation is one of the most important forces that will shape our today and tomorrow. …as a nation among the rapid pass of the history, it is time to run exactly through the subject of science, technology and innovation rather than walking.'

Importance and applications of innovation increase in Turkey, however, it is not a leading country in terms of development and application of technology. In fact, it is mostly dependent to exported technologies for increasing its innovation capabilities. This fact drives the idea of researching for other competition resources like design as one of the survival and success factors. Hence, the scope of this thesis is specified around product innovation applications, especially DDI practices in Turkey.

Furniture industry is one of the most prominent industries in which design is a master trigger for competition. Through the history, design is featured within the furniture products due to their prior use in daily lives aiming to satisfy functional and psychological needs. Furthermore, furniture design applications are easy to overcome among other technology based industries. Even, craftsmanship is necessary for production of furniture; for instance, a single person should design and produce his/her chair. In fact, main production systems and materials in furniture industry are not dramatically changing; the manufacturers are mostly using the same techniques and materials as their ancestors (Ata, 2015). Therefore it would be analyzed in terms of DDI applications in emerging economies like Turkey. Because it is much more design oriented than other industries like electronic goods which would be facilitated with technical advantages among others rather than design. Thus, industrialization and

innovativeness levels of economies would not to be specified as the main drivers for furniture industry; but design culture and design discourse may be much more important than technological discourse in this perspective. Instead, design would be the prior strategy for competing with developed countries for Turkey. Hence, furniture industry is determined as the research sector to be focused on DDI practices due to its easy applications and thereby to its potential to improve the industrial capabilities by creating future life contexts.

In addition, the idea of analyzing recent applications of DDI in furniture industry is in my mind for three years as I have worked as a product designer in Atagür Office Furniture Company in 2012. The company was founded in 1958 (Atagür, 2010), however, it could not reached to the expected growth rate even more than 50 years passed after its settlement. The restrictions to design competitive and innovative products that would stand for the firm were sourced by the lack of strategy plan for innovation by design. As a designer, I was expected to design innovative products to compete with Turkey's office furniture leaders. However, it was not only a designer issue but also a firm based strategic approach with its managerial tools like internal and external organization, process planning and marketing strategy and so on.

This study is built up on my above observations in Turkey about DDI applications. However, studying additional cases would increase the validity of the research. Therefore, besides DDI applications in Turkish furniture, that of Sweden is determined to be explored and analyzed in this thesis.

Sweden is a small country with a population approximately ten percent of Turkey even though it has more than half of Turkey's land which is occupied by mostly forests. Accordingly, wood workmanship and its related industries are developed in Sweden. Furthermore, furniture industry in Sweden is shown as the leader of the global market with Italy in terms of their innovative furniture designs (Sigolotto, 2010). Moreover, Sweden is a leading country regarding design culture that is improved by elegant and natural style of *Scandinavian design*. Even though Sweden competes with Italy in terms of furniture design outcomes, Italy is not studied in this thesis since Verganti (2009) states that it is hard to get to be trusted by and maintain data from Italian furniture companies.

1.2. Aim of Study

The aim of the present thesis is to explore DDI practices of furniture companies in Turkey and Sweden as to be analyzed from a macro level. The literature reviewed in CHAPTER 2 frames the analysis in terms of strategic, operational, market-entry and organizational dimensions. Through those dimensions, further objectives are defined as to explore the strategies and practices of furniture companies in terms of their:

I.   Approaches to DDI regarding their research agendas and sources,

II.   New product development processes,

III.   Tools and methods in market-entry phase,

IV.   Organizational structures regarding internal and external actors of DDI.

The aim of selecting two different cultures is to determine if there are various approaches to the application of DDI theory changing accordingly. In fact, in various cultures and especially cultural varieties in a specific culture affect the language of design established there, since objects are meaningful to people living in a socio-cultural environment. National design culture would be the platform in which various cultural experiences are generated to design and yet, to form a country level design culture. The impacts of national design cultures on DDI applications in furniture industry are analyzed via exploring country level innovation performances and yet design cultures of Turkey and Sweden.

1.3. Research Questions

Through the above implications and the aims of this thesis, four main research questions are defined:

I.   How do the furniture companies research for and design a new product meaning for a new costumer?

II.   How do the furniture companies translate the design with a new meaning into a new product?

III.   How do the furniture companies deliver the new products into the markets?

IV.   How do the furniture companies organize their innovation process in terms of internal and external actors

1.4. Methodology

An exploratory approach is internalized in this thesis. First, innovation performances of Turkey and Sweden are explored in CHAPTER 2 through quantitative data gathered from international competitiveness and innovativeness reports aiming to propose a general idea about national level discourses in which furniture industries adopt their strategies and practices accordingly. Second, design cultures of those countries are reviewed from academic literature to get insights to national level design approaches as to better analyze whether they have impacts on DDI practices.

Case study method is conducted aiming to provide evidences from reality to the theory. Through this perspective, theoretical implications would be tested and improved via analyzing multiple cases in both countries. Furthermore, it provides evidences about DDI practices from different countries to compare and contrast even the Swedish cases are limited to two according to the number of four cases from Turkey. In fact, this thesis does not claim that it provides a comparative analysis, but the explorative results are compared through cross case analysis.

At the first stage, Turkish furniture industry is reviewed via news, magazines, and national furniture associations' websites for furniture firms which specify a *designers* section in their websites. Six companies (Koleksiyon, Ersa, Nurus, Tuna, Bürotime and Enne) are determined as to be the cases for this thesis. Nurus, Ersa and Enne are our prior cases due to their selection by *Architonic* database which is a well-known and also biggest international resource for architecture and design (Ebeş, 2014).

Case companies are selected through their designer portfolios and international offices and retail shops/agencies provided by their websites. The former represents the companies' approach to design in which they orient it to their strategies. The assumption here is that via providing a designer portfolio in their websites, they try to emphasize their brand value by design. In fact, without innovation and design synthesized together, it is hard to compete globally. Furthermore, designing the *meaning,* which is the concern of DDI, is a profession of designers. Hence we do not search for sales reports or patent numbers of furniture companies since we define design-driven innovation as "making sense of things" (Verganti, 2009) which refers to meaning of products. In fact, meanings are not the matter of R&D (Verganti, 2009). Thus we focus on designer portfolios who are responsible for making sense of things. The latter defines their global market

practices which allow us to assume that they have a strategic design and production process. Because, competing in a global furniture market requires a well-defined design and innovation strategy in which we would explore DDI practices.

15 of 48 Swedish companies from the Architonic database are selected as to be get contacted through their designers and abroad offices/agencies quantities. Offecct and Skandiform are involved in this study and it is defined as necessary not to repeat several practices after completion of Turkish cases.

Case companies are analyzed throughout a theoretical framework in which research questions are focused individually based on various dimensions as strategic, operational, market-entry and organizational phases. This type of division of the process separates the activities into individual correlated phases whose dynamics are characterized by contributors' efforts to better improve the products. For instance, strategic dimension covers design-related activities focusing on the ideas to be generated to form the product concepts whereas operational dimension refers to the operational activities held by producers and consists of the new product development (NPD) processes. In a similar way, market-entry dimension constitutes the companies' strategies for launching the end-products while organizational dimension stands for critical organizational structures through the entire DDI process.

Through the case study research tools, semi-structured interviews are conducted within furniture companies of both countries. Because it provides a wide perspective in which we would generate various interpretations of our respondents. In fact, it allows interviewees' comments on the questions in a conversational interview so that we might get better insights to their ideas following a pre-determined path.

Product/design managers are selected for one side for the exploration of the entire process since they actively manage it. They are specified as the gatekeepers of design process at this stage. Designers are determined on the other side to explore the strategic dimension and validate the data obtained from product/design managers.

Interview questions are pre-tested with a small company's (Rafevi) design manager, Hamit Ebeş; and the designer, İsa Candemir. They are asked to give feedbacks and comments on the questions to better address DDI process in furniture industry. Furthermore, an academic researcher in industrial design, Semih Danış, who has various projects other than furniture is interviewed to analyze if the questions are more descriptive to the furniture industry. Through his suggestions, the questions are

regenerated to focus on designers' general strategies so that we would analyze them in a wider perspective.

Firm level innovation practices are analyzed regarding innovation as "commercialization of goods" (Godin, 2008, 2010). Because this perspective provides us ability to define *commercialized goods* as to be internal *outcomes* for each case company. Thus, firm level innovation activities are analyzed throughout an *output approach* (Godin, 2002) determining individual product cases as samples of our companies. Product/design managers are asked to specify the most innovative products as a product case.

By defining a subject as a case within an organization, it is objected to validate data gathered from designers and design/product managers via asking similar questions about the cases of subject. The strategic approaches of designers are combined with that of companies through analyzing case products. Furthermore, operational and market-entry phases of DDI process is explored via comparing data acquired from those two different actors involved in NPD process. In addition organizational structures of DDI are analyzed through the same approach.

The interview data is deciphered for each case and inductively coded without any categorization first. The codes of the designers and product/design managers are grouped under strategic, operational, market-entry and organizational dimensions and analyzed through the theoretical framework. Cross-case analysis is carried out by collecting general common practices. In this stage, codes and their implications are used to better clarify and standardize the results under several outcomes to address country level commonalities and differences.

1.5. Structure of the Study

First, academic literature is reviewed focusing on innovation and design. Innovation literature is analyzed through its economic realm since it is a key feature for economic development of companies and yet economies. An output approach is internalized for firm level analysis of innovation and design by focusing on the product innovations provided by companies. Literature about firm level innovation activities is carried on this perspective regarding strategies, processes and organization of innovation. On the other hand, an activity based approach which is related to policy

making is adopted for national level innovation activities. Through this perspective, literature is reviewed according to Turkey's and Sweden's national innovation performances and design cultures. The main structure of the thesis is shown in Figure 1.5.1.
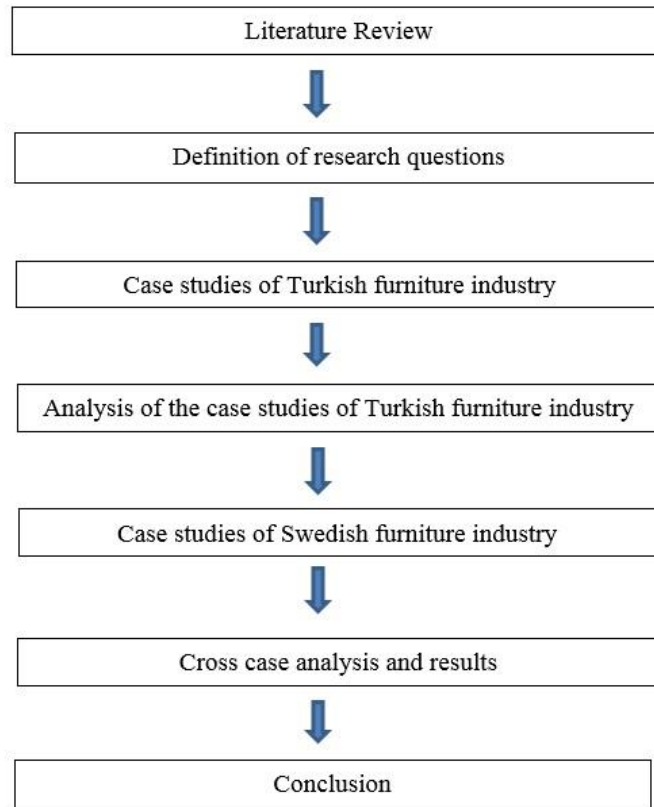
Figure 1.5.1. Structure of the thesis

1.6. Limits and Restrictions

The initial idea on deciding on Turkey and Sweden as the cases to be analyzed through DDI practices in furniture industries was to deliver a comparative analysis of those two evidences. However, we could not reach to our expected case quantity of four yet Skandiform and Offecct accepted to be get involved out of 15 companies. Therefore, this thesis does not propose an exact comparison of Turkey and Sweden in terms of its goal, but the similarities and differences are explored accordingly.

The limitations of international research changed our approach to an explorative one rather than a comparative study. Furthermore, due to the limited time and research costs, we had to analyze DDI practices from a macro level determining basic and general applications for separate dimensions of the process.

CHAPTER 2

BACKGROUND INFORMATION

2.1. Introduction to Innovation

Innovation concept has gained importance in twentieth century almost from the beginning of industrialization. Most of the societies in our epoch give a central magnitude to this interdisciplinary phenomenon. There are many studies in scientific and technical literature covering the concept in various approaches to specify explicit definitions and outcomes of such a broad term. However, the perceptions and definitions about innovation are mostly related to its technological realm (Gaynor, 2002).

Godin (2008) discusses the term as a category addressing innovation in three basis through history as imitation, invention and innovation. Imitation is recorded first by Plato regarding the physical objects as the imitations of God and true nature.

Invention is used in fourteenth century regarding knowledge and science (Godin, 2008, p. 14). While imagination in arts and literacy and discovery in science shared their place with invention, it came to become one with technological inventions which is defined by patent system identifications in late eighteenth century (Godin, 2008, p. 19).

The term *novation* was rarely used before twentieth century; instead, create and invent were preferred for creative and productive abilities (Godin, 2008, p. 23). Very first few uses of the term innovation and theoretical discussions about cultural change was made by anthropologists framing the concept in terms of invention versus imitation (Godin, 2008). Liguori and Schnepp (1954) defines innovation as: "any thought, behavior, or thing that is new because it is qualitatively different from existing forms" so as to extend the scope of the term rather than concentrating mainly on technological inventions.

Among sociologists, the term innovation is discussed within social change focusing on "invention, ingenuity, novelty, creation, originality, imagination, discovery and initiative" (Godin, 2008, p. 27).

Economists' perspective of innovation is revealed within two approaches, for the purpose of this thesis, among various collection of theories: (1) the Schumpeterian, and (2) the Neo-Schumpeterian. The former represents innovation as commercialization

(Godin, 2008, 2010, 2012) of technical inventions whose focus is on *process innovations* in its very early stages but is followed by focusing on the *product innovation* (Godin, 2010), while the latter is a consideration of *policy issues* (Godin, 2012).

Schumpeterian theory of economics consist of two models as Mark I (or widening) and Mark II (or deepening) (Breschi, Malerba, & Orsenigo, 2000; Erbil, 2007; Malerba, 2002). The first is based on entrepreneurship 'creating a destruction' in technological innovation process in which the entrepreneur is the key agent of innovation (Breschi et al., 2000; Malerba & Orsenigo, 1997). On the other hand, the second is characterized by 'creative accumulation' where large firms are emerged (Malerba & Orsenigo, 1997). However, combined productive functions in the process and recognition of revolutionary potential of innovation are in common for both models (Erbil, 2007). Hence, this approach defines a structure for innovation which proposes how innovative products should be developed (*the process*) and how innovation process would be instituted (*organization*) at firm level. Because the mainstream focus on this approach is on firm level innovations including the process and organization innovations to develop products.

Neo-Schumpeterian (or evolutionary) theory (i.e., Nelson & Winter, 1982) bases on technical change regarding radically different mechanisms that is diffused through the national and international economies (Dosi et al., 1988; cited in Erbil, 2007). The firms have to change their technical agenda (processes) and organization to cope with dynamically changing socio-institutional framework that always influences the nature of the mechanisms (Dosi et al., 1988; cited in Erbil, 2007). This approach provides a qualitative change and a diffusion of systems perspective to the organizations (in regional settlements) (Erbil, 2007) via focusing on knowledge that varies across sectors (in those regions) (Malerba, 2002). Since the systems vary at the country level so does the *knowledge*, a *country level approach* is crucial.

Godin (2012) discusses this dimension through the approaches stating innovation as *commercialization* and *policy as application*. The first represents productivity issue for the determinant to the measurement of innovation (e.g., the linear proportion between the labor count and innovativeness) in a company, but later on, it was profit oriented rather than the productivity (Godin, 2012). However, its implications to the measurement of innovation is remarkable for this study as it indicates *firm level process* and *organizational* determinants The second is emerged through evolutionary theory's claim that technological changes are for the customers rather than the firms, thus knowledge about users is required besides

technological knowledge (Godin, 2012). Accordingly, *cultural* aspects and *national systems* (so do the *design culture* and *clusters*) emerged in economies.

Here in this thesis, Schumpeter's theory is regarded as commercialization of goods focusing on the product with an "output approach" (Godin, 2002) and their production processes at the firm level but the evolutionary theory is determined as dynamic innovation capabilities of countries (Turkey and Sweden) throughout an "activity approach" (Godin, 2002). Hence, the former implies combining *production functions* in a new way and the latter contributes technological change as a dynamic response of the companies to the government policies (Godin, 2012). Therefore a conceptual model would be developed through this distinction to differentiate levels of product innovation analysis in this thesis as shown in Figure 2.1.1.

Figure 2.1.1. Stages of innovation analysis
(Source: The author's own conceptualization)

The firm level concepts consist of design specific literature and discussed in separate sections. Besides, the country level dimension firstly focuses on design and innovation relationship, and then national (Turkish and Swedish) knowledge (design culture) and national innovation performances to draw a perspective for the nature of furniture manufacturers. There are almost more than those criteria, but it would be remarkable to distinguish the main approaches in which this thesis is structured. In addition, it is organized to better understand innovation and design relationship via dividing firm-level innovation analysis into three; one which represents operational level processes; the other that is formed by strategic approaches to the design and the last constitutes the organization .Meanwhile, even this conceptualization is based on economic theories, relevant implications of which are interpreted through this thesis to make its structure visible.

2.1.1. Categories of Innovation

Innovation requires not only designing, engineering and managerial skills to generate it and obtain continuity of improvements; but also integration of R&D activities into practice and the employment of technological abilities to overcome high levels of complexity, quality and productivity (Diaconu, 2011). Therefore studies about innovation types varies as "profit model, structure, network, process, product performance, product system, service, channel, brand, and customer engagement, product, operational, strategy and management innovation" (Vaughan, 2013, p. 5). However, our focus on this thesis is product innovation and its dynamics.

Joseph Schumpeter (cited in Croitoru, 2012, p. 142) classifies innovation as "new combination" in five cases: the introduction of a new good; the introduction of a new method of production; the opening of a new market; the conquest of a new source of supply or raw materials or half-manufactured goods; the carrying out of the new organization of any industry.

Oslo Manual (2005) categorizes innovation at the firm level not only as "product innovation" and "process innovation" but also as "organizational innovation" and "marketing innovation". In this sense, product innovation refers to both production and commercialization of new goods (products or services) and significant improvements of existing products while process innovation represents the actualization or adoption of new or advanced production or delivery process (OECD, 2005).

Innovation is not a unified phenomenon because some innovations may disrupt and break the existing competence establishments whereas some others improve current goods to get advance in competition (Abernathy & Clark, 1985). Every innovation needs a variety of organizational environments and different managerial skills according to the assumption that products are not homogeneous. So that, the firms try to gain competitive advantage by offering products that have one or more product achievements such as reliability, performance, availability, aesthetic appearance, ease of use, image (among others) and initial cost (Abernathy & Clark, 1985). Abernathy and Clark (1985) define four categories of innovation in relation to two drivers: the firm's customer base covering markets and linkages to the customers and the firm's technical competence regarding the firms' capabilities of technology and production. Their four innovation

typologies are architectural, market niche, regular and revolutionary innovation (Abernathy & Clark, 1985).

Any innovation has to have a novelty degree by definition even it is technological (product or process) or non-technological (organizational or marketing) (Iyer, LaPlaca, & Sharma, 2006; OECD, 2005, p. 57). As Diaconu (2011) notes, novelty level sorts goods and processes as "innovations" and "non-innovations" (*see* Table 2.1)

Table 2.1. Type and degree of novelty and the definition of innovation
(Source: Korres, 2008, p. 5)

			Innovation		Not innovation
			New to the World	New to the Firm	Already in the Firm
Innovation	Technologically new	Product			
		Production Process			
		Delivery Process			
	Significantly technologically improved	Product			
		Production Process			
		Delivery Process			
		Organisation			
Non Innovation	No significant change. Change without novelty or other creative improvements	Product			
		Production Process			
		Delivery Process			
		Organisation			

Through the novelty degree -in terms of the markets-, products/services or processes may be "new to the firm", "new to the industry (in the country or to the operating market of the firm)" or "new to the entire world" (OECD, 1996, 2005; Osta, Cartwright, Prabhu, & Bevolo, 2007). However, when distinguishing the innovation's novelty level, it is important to classify the level of the firms, countries, regions, markets and so on. Because products may be new to a country/region/market although they are established by others (Diaconu, 2011; OECD, 1996).

Innovation is classified through novelty level as "incremental innovations" and "radical innovations" (Freeman, 1982) because every product/service/process can have a different value of innovation in its category. Both types of innovation is discussed within a wide range of perspectives; technical process innovation (i.e. Dewar & Dutton,

1986), organizational innovation and innovation process (i.e. Ettlie, 1983), technical change (i.e. Nelson & Winter, 1982), and so on.

Incremental Innovation

It indicates minor changes on existing product (product/service/process), enforces the potential of existing product - regarding an improvement on it – and usually empowers the dominance of established firms (Dewar & Dutton, 1986; Ettlie, Bridges, & O'Keefe, 1984; Nelson & Winter, 1982; Orlikowski, 1991; Tushman & Anderson, 1986). Although it does not end with dramatic developments in science and industry, by calling for considerable skill and ingenuity, the outcome is significant for economic consequences (Henderson & Clark, 1990) and it has particularly importance in science and economics by its follow through after the period of radical innovation (Freeman, 1987).

Radical Innovation

It contains discontinues events and usually it is the result of a deliberate research and improvement activity (Freeman, 1987). It differs from incremental innovation due to its definition consisting of "fundamental changes that represent revolutionary changes" (Dewar & Dutton, 1986, p. 1422). Radical innovation opens up entirely new markets and applications via having different engineering and scientific perceptions (Dess & Beard, 1984; Dewar & Dutton, 1986; Ettlie et al., 1984).

Handersen and Clark (1990) introduces "architectural" and "modular innovation" typologies according to their framework focusing on the components of a product rather than the entire outcome.

Through the literature product, process, organizational, service, marketing and market niche innovations are detected as the main distinctive categories of innovation. Furthermore, Oslo Manual (2005) places technological innovations as the broader category of product and process innovation while grouping marketing and organizational innovations under non-technological innovations (*see* Figure 2.1.2).
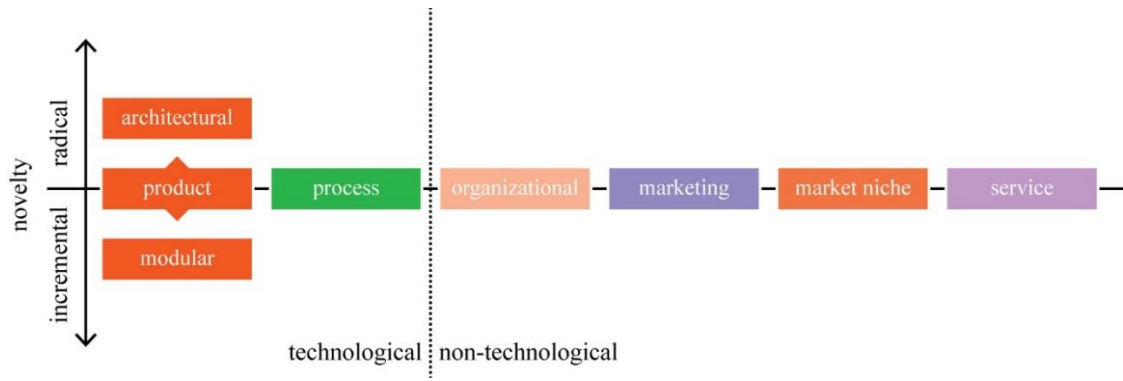
Figure 2.1.2. Types of innovation
(Source: The author's own conceptualization)

In addition, modular and architectural innovations (Henderson & Clark, 1990) would be classified as specific product innovation categories through a macro level because of their focus on components of the outcome.

2.1.2. Characteristics of Innovation

Jantz notes that (2012, p. 528) "radical innovations represent a clear departure from existing practice whereas incremental innovations are more routine and support existing practice". In a similar way, Dosi (1982) discusses innovation within a framework of technological change in which radical innovations lead to significant modification of established technological trajectories while incremental innovations, by definition, are limited to the path given by radical innovations. The degree of performance and innovation types are given accordingly by Sigolotto (2010) in Figure 2.1.3.
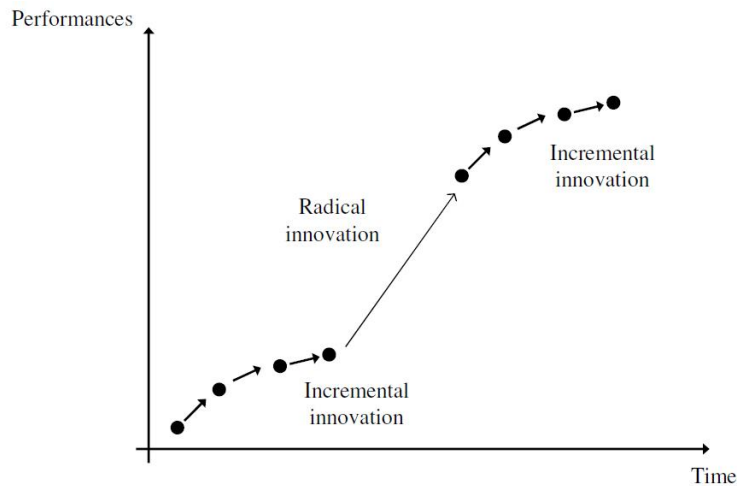
Figure 2.1.3. Performance level and innovation types
(Source: Sigolotto, 2010, p. 15)

Radical innovations affect "the nature of human interaction, productivity, commerce, creativity, and recreation" (Eisenberg & Fullerton, 2012, p. 11). The diffusion of this effect among economies, industries and markets creates new contributions to the competition. As Osta et al. (2007, p. 149) notes, the consumers, competitors, regulators or changing technology may lead to "long-term competitive dominance" - or costly failure. In addition, Eiriz, Faria, and Barbosa (2013, p. 104) claims that: "since change is always present in the daily life of a firm, then, it could be said that there is always ome kind of innovation, generally incremental in its degree of novelty".

New skills, knowledge and abilities are required for innovative competences in the establishment of (incrementally developed) products, but discontinuities are the results of magnitude improvements in cost and/or performance and in know how (Tushman & Anderson, 1986). Thus, companies aiming to have a competitive advantage have to better reach and manage the knowledge sources for establishment of radically improved products, services or processes and for incremental developments of them. From this perspective, Diaconu (2011) states, most innovative companies introduce both types of innovation at the same period aiming price or technological competitiveness.

Novelty degree of which the innovation activities provide as new products, processes, organizations, marketing applications etc. is characterized within a strategic approach by companies that have competitive advantage among others. According to this assumption, strategic approach of the company to the innovation would be analyzed via the novelty degrees of its products. Studies through the novelty level (Norman & Verganti, 2014; Verganti, 2003, 2006, 2008, 2009); the process of re-design (Rothwell & Gardiner, 1988); the strategic perspective of the companies to product innovation (Sigolotto, 2010); design in competition (Filitz, 2015) shows that novelty levels of the

established products (processes/services/organizations) is the outcome of a strategic decision.

The outcome of the process may be sourced by strategic approaches and/or operational applications. In other words, it may be radical (or not) if its main sources are strategic tools like *design* and *disruptive technologies*. Because design *pushes* the *meanings* attributed to the *image* of a product while technology *pushes* the products to be used in a different socio-cultural context (Verganti, 2009). Verganti (2009) describes radical innovations as the outcome of a *push* strategy whether it is driven by design or disruptive technologies. Thus, Apple's İpod is given as an example of *technology-push* approach and Kartel's Bookworm is introduced as a *design-push* outcome (Verganti, 2009).

2.1.3. Dynamics of Innovation

Backhaus (2003) argues that entrepreneurs are the facilitators of economic development via giving new directions to the economic "level of the circular flow" through satisfying "new" needs in consequence of satisfied ones. Hence, "new combinations" of developments in different organizational schemes is planted in various economies creating a circular flow of development. In this flow, Schumpeter's metaphor of "creative destruction" (*cited in* Croitoru, 2012) by entrepreneurs defines the dynamics of innovation regarding radical innovations as the threatening force over established enterprises who are not able to develop it. At that point, destruction phase starts. Besides, according to Schumpeter (*cited in* Croitoru, 2012), radical innovators are the facilitators of economics due to incremental development efforts devoted to them.

The sequence of incremental and radical innovations in its established industry has a regularity in which technologies and linkages are discontinuously changed and then followed by incremental changes (Utterback, 2004; Utterback & Abernathy, 1978). Tushman and Murmann (1998) represent a model (*see* Figure 2.1.4) that dynamically changes through a path according to technological discontinuities.
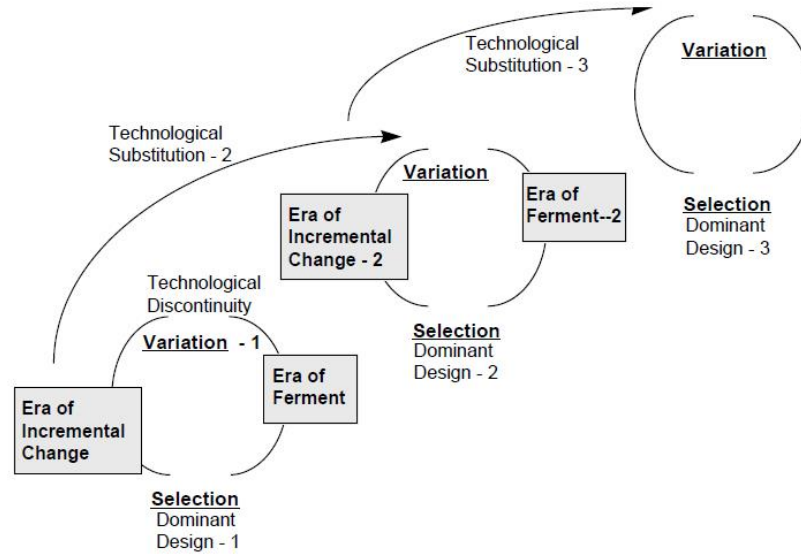
Figure 2.1.4. Technology Cycles over Time
(Source: Tushman & Murmann, 1998)

2.2. Product Innovation Strategies

There are many discussions and classifications to analyze and theorize innovation through its technological and economics realms. Main distinctive points and models of which are briefly stated above in respect to the scope of this thesis. Following literature review is mainly focused on strategies of innovation through design that would be implemented by companies.

According to Eiriz et al. (2013), the determinants of innovation strategies for a firm in its life cycle is blended by the innovative outcome which is the result of key decision factors of the firm in terms of innovation types or degree of novelty. They argue that these decisions are the main drivers for innovation strategies. Moreover, the authors claim that innovation strategies vary over time and across firms' growth stages. Eiriz et al. (2013) argue that, in terms of typologies, the strategic approach of the firm to the innovation changes accordingly its maturity level because at the beginning of the launch of a newly designed product, the evidence from the users is inadequate so that firms at the entrance level would rely on their strategies to radical innovations. Thus, many companies focuses on product innovation rather than process innovations in which main concern of the firms are about efficiency aspects after reaching a dominance in the product segment This claim is addressed early by Utterback and Abernathy (1975) as a

suggestion that product innovation is more important in early stages of a firm rather than process innovations which would be focused on in mature phases.

The patterns of innovation strategy lies on product development, learning by experience, restructuring and discovery phases (Eiriz et al., 2013) (*see* Figure 2.2.1). From this perspective, "product development" (strategy) occurs when firms incrementally innovate their products while they "learn by experience" of "existing technologies, processes, markets, and people, which may allow firms to evolve over the growth stages" (Eiriz et al., 2013, p. 105).According to their classification, "discovery" refers to creation of new products based on a radical innovation. It is dependent to discontinuously developed technologies (Tushman & Anderson, 1986) and it is pushed by the vision of firms not only to find new product meanings and languages but also "through a deep understanding of broader changes in society, culture and technology" (Verganti, 2008). "Restructuring" is defined as the change of processes by a radical innovation that takes place in the firm's processes leading to its restructuring in areas such as "their information systems, production, market research, or even in organizational structures" (Eiriz et al., 2013, p. 106).
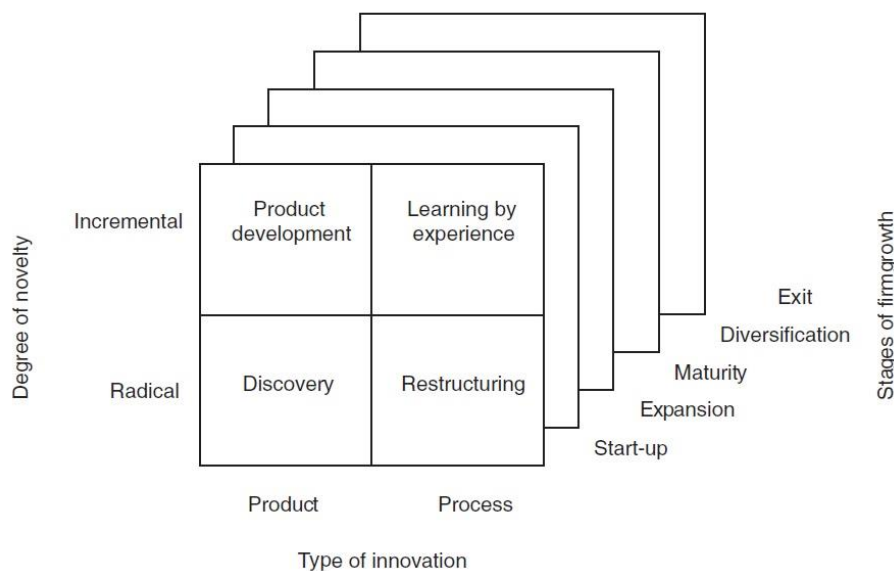
Figure 2.2.1. Typology of innovation strategies
(*Source:* Eiriz et al., 2013, p. 104)

In terms of novelty degree, incremental innovations are referred to the products that are mostly developed through user research approaches (Sarja, 2015b; Verganti,

2009) but radical innovations are developed with the entrance of disruptive technologies (into the production process) (Herstatt & Lettl, 2000; Sarja, 2015b; Verganti, 2009) or sourced with a research for providing a future proposal to the users regarding the improvements of meaning and languages in products (Verganti, 2003, 2008, 2009). In a similar approach, Rothwell and Gardiner (1988) states that high rates of technological changes deploy small amount of radically improved products which are followed by incremental ones to satisfy evolving needs of various user segments. Meanwhile, Rubera and Droge (2013) focuses on the marginal effect of design-driven and technology innovations:

> "...synergistic interaction could arise from the utilization of technology innovation as a platform for design innovations... Also, design innovations can be used to help consumers realize the benefits of technology. Thus, the complementarities of technology and design innovations could have marginal impact in enhancing firm performance in addition to the value of technology versus design innovation separately; i.e., design and technology synergistically interact. (Rubera & Droge, 2013, p. 448)"

In terms of sources of innovation, as Verganti (2009, pp. 3-4) underlines, product innovation has three strategic basis: breakthrough innovations in technologies to get better product performance, better analysis of user needs for improved product solutions and radical innovations of meanings and languages of products. Through this distinction there are three approaches in the literature: technology-push (e.g., Herstatt & Lettl, 2004), demand/market-pull (e.g., Mowery & Rosenberg, 1982) and design-push (i.e., Verganti, 2003, 2008; Verganti, 2009)

Another classification for the strategies of product innovation is built in terms of the information it represents. The variety of information embedded in a product differs according to the strategic approach of the companies to the product innovation. If the product corresponds to the information about existing needs of the customers, then it would be a result of a customer-pull approach. If the information gathered from a product relates generation of new production functions to differentiate an existing product (Eiriz et al., 2013), it would be specified as technology-push approach. Verganti (2008)[1], in his study of design and innovation relationship, focuses on products' "functional utility" that is defined by functional (technology) and meaning (languages) perspectives. Thus, the latter is obtained by the information served by the product meanings which addresses design-push approach.

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[1]All citations of this study are retrieved from the working paper of the article cited here.

2.2.1. Market-Pull Approach

According to market-pull approach, market needs are defined as innovation sources (Herstatt & Lettl, 2004; Sarja, 2015a, 2015b). Utterback and Abernathy (1975, p. 642) defines product innovation as "a new technology or combination of technologies introduced commercially to meet a user or a market need". They preserve innovation with its application to the market regarding product innovation, in which the success is "obtained by identifying relevant product requirements" (p. 643), is tended to be driven by new market needs. Moreover, Luh et. al (2012) states that real competitive advantage lies on a good understanding of user needs to be satisfied by relevant products rather than the variety of them that a company may provide to modern business. Furthermore, Iyer et al. (2006) underlines that a perceived market need is expected to be satisfied by designing products that would be developed in a short period of time. In addition, Rubera and Droge (2013) argues that ability for stimulating new demand via product innovation has a positive effect if excitement and interest is created.

Different perspectives for developing methods of user research is found in the literature (e.g., Kamper, 2002; Rosenthal & Capper, 2006; Whitney & Kumar, 2003) but the main priority here for this thesis is how to approach to the user needs in terms of product innovation before explaining them.

Maslow (1943) defines at least five goals of us which may be called as needs: physiological, safety, love, esteem, and self-actualization in a hierarchical order. According to Reid-Cunningham (2008) self-actualization differs from person to person in accordance with personality, culture, circumstances and other factors. Furthermore, the needs are not have an end because they are always regenerated by these factors and we are always strive for satisfying them (Reid-Cunningham, 2008). Through this perspective, life is "a journey of ascent from the lower to higher levels" (Lambert, 2011, p. 3).

Maslow's hierarchy of needs has a crucial importance in terms of product innovation, especially for user-centered design approach, because it classifies the needs as basic so explicit needs and implicit so tacit needs. In a narrower sense, Sanders (1992, p. 51) classifies user needs according to their levels of need expression for product development research as shown in Figure 2.2.2. Actually, explicit needs are expected to be more easily converted to product designs but tacit and also latent needs are hard to

explore and interpret for designing the relevant product.. Because, tacit needs require knowledge about user experiences (Chandrasegaran et al., 2013) which is hard to be explored. That is why the concept of "design with users" emerges instead of "design for users" (Sanders, 2003).

Observable needs are displayed in action and can be determined through observation by experts.

Explicit needs can be expressed by participants in words.

Tacit needs are conscious needs that participants are unable to express in words.

Latent needs are subconscious, possibly dormant needs that participants are unable to express in words.
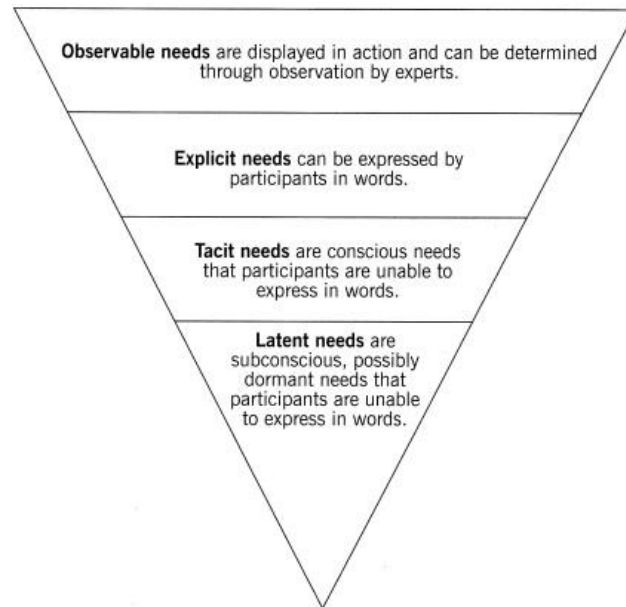
Figure 2.2.2. Levels of need expression
(Source: Sanders, 1992)

User-Centered Design

One application of market-pull approach in the literature is user-centered design in which "the user of a product, application, or experience is at the center of the design process" (Pratt & Nunes, 2012, p. 12). Not only understanding user needs and to whom the product will be designed (Pribeanu, 2014) but also uptake the limitations of the people is required for this concept (Pratt & Nunes, 2012). Furthermore, according to Pratt & Nunes (2012), the designer is responsible for analyzing and foreseeing the engagement of the users with products, and also testing them in a real world. User-centered approaches allow users to bring their own conceptualization and meanings to the real world (Krippendorff, 2004; McDonagh & Thomas, 2010) by providing them a wide range of use and acceptance of products/services in which the results are increase in productivity and reduction in errors (Zoltowski, Oakes, & Cardella, 2012).

Participatory / Experience / Co-Design

In this perspective, according to Sanders (2002), "a new design space" as "CoDesign Space" where professional designers work together with ordinary people

emerges. She states (Sanders, 2003) that "experience design whose aim is to design users' experiences of things, events and places" (p. 2) which refers to knowing better about the tacit and latent needs of them from their experiences of products designed within collaboration (see Figure 2.2.3)
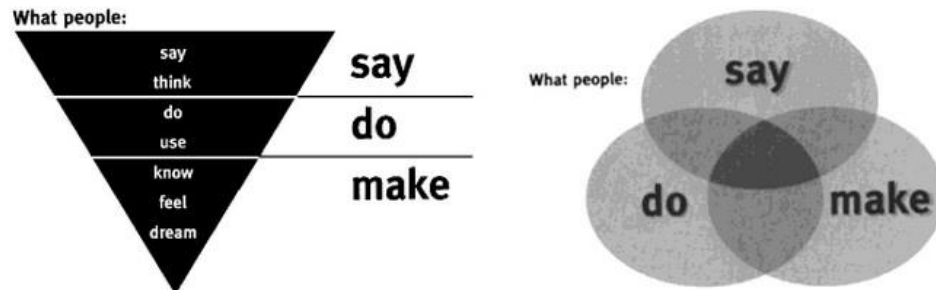
Figure 2.2.3. What people say, do and make
(Source: Sanders, 2003, p. 4)

Emphatic Design Research

In this perspective, users' emotional impacts to the products are much more important than listening to the voice of the customers (Luh et al., 2012). Because of the users' feelings to the products that are bought for, the users may not know or describe their needs. Thus, according to Luh et al. (2012) designers not only design products, but also the user cognition. Emphatic design deepens the designers' understanding of users by providing "intangibles such as feelings, emotions, dreams, aspirations, and fears" that may be sources for inspiration, cues and triggers to design (McDonagh & Thomas, 2010).

2.2.2. Technology-Push Approach

Technology-push concept refers to technological research and development for marketing new products that are radically designed (Sarja, 2015b). According to Herstatt and Lettl (2000, p. 2) "an emerging technology or a new combination of existing technologies provide the driving force for an innovative product and problem solution in the market place". The authors claim that radically improved products or processes as the outcome of technology-push approach, in certain cases, possibly create their own markets.

2.2.3. Design-Push Approach

Akiike (2014) underlines that most existing studies (e.g., Christensen, 1997; Christensen & Bower, 1996; Krippendorff, 2004) focus on functions regarding them as technical attributes like product specifications. Verganti, (2008) notes that there is another dimension for products as semantic value regardless of novelty level:

> "...we may say that innovation may concern a product's functional utility, its meaning or both. And alike functional innovation may imply an incremental or radical improvement of technical performance, also innovation of the semantic dimension may be more or less radical." (Verganti, 2008, pp. 11-12)

Porter (1998b, p. 37) points out that design (or brand identity) and technology are the strategic forms of differentiation in the market via enhancing market share. Technologies are for improving production systems and product performances (Talke, Salomo, Wieringa, & Lutz, 2009), and also for reducing costs while design innovation is responsible for human sensitivity (Rubera & Droge, 2013; Verganti, 2009). Furthermore, there are many product attributes including industrial design elements like appearance and user friendliness (Dumas & Mintzberg, 1991). In addition, product design involves "construction for human interaction and aesthetics" (Veryzer, 1995). Through this perspective, besides market-pull and technology-push approaches, Verganti (2003; 2008; 2009) describes another approach to the product innovation strategies as "design-push".

Verganti (2003) states that, designing a product requires knowledge about the customers for commercialization; knowledge about relevant technologies for production and knowledge about product languages. According to Verganti (2003) the last describes "knowledge of signs and symbols that will deliver a particular message, as well as the semantic context (the socio-cultural models) through which the user will give meaning to those signs" (p. 37). Radical design-driven innovations propose breakthrough messages and the drivers of which differs from that of market-pull and technology-push approaches; hence, the starting point here is neither the customer needs nor the technology even they would be developed through the latter (Verganti, 2003). In design-driven innovation (DDI), languages push the needs (through technology) while technologies push the needs through languages in technology-push approach and needs pull the technologies and languages in market-pull approach (Verganti, 2003) (see Figure 2.2.4).
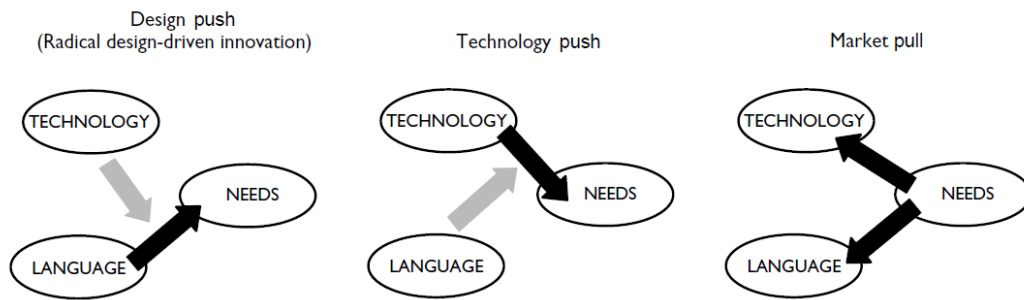
Figure 2.2.4. Knowledge drivers in different innovation approaches
(Source: Verganti, 2003, p. 38)

Verganti (2003; 2008; 2009) argues that radical DDIs are the results of design-push activity where the designers are *pushed* by a vision or ideology which defines *proposals* for future life contexts. Verganti (2003) underlines that these design-push proposals eventually satisfy latent needs whereas market-pull innovations are for explicit and immediate needs, thus, through the novelty level, he classifies market-pull approaches as incremental innovation strategies.

Verganti (2003) elaborates a framework for the relation of form and function in a product (*see* Figure 2.2.5). He considers emotional and symbolic values as the message of the product while technologies introduce and define functions.
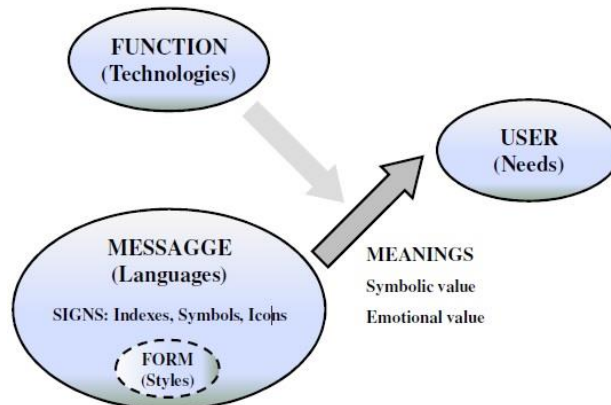
Figure 2.2.5. Design-driven innovation
(Source: Verganti, 2003)

Main Phases of Design-Driven Innovation:

Listening: This phase comprises of searching for new meanings and knowledge sources of innovation. Possible new meanings and languages of new products are

25

researched by companies. It comprises of the search for new interpreters to access these sources.

İnterpreting: This phase comprises of generating new vision and elaborating new proposal for a new radical change in languages and meanings. It covers collecting and reinterpreting of the knowledge gathered from listening phase. Internal researches and developments to generate those knowledge to produce radical change is considered here in this phase.

Addressing: It covers the introduction of new radical meanings to the other interpreters in the design discourse. Defining the most promising means through which interpreters can discuss and then internalize those new proposals is the scope of this phase.

Verganti (2009) defines those phases in a framework as shown in Figure 2.2.6.
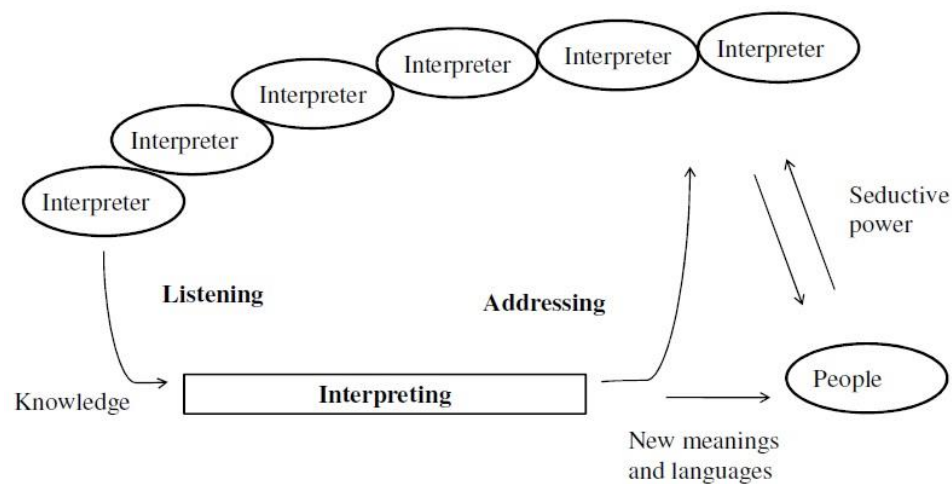
Figure 2.2.6. The process of design-driven innovation
(Source: Verganti, 2009)

DDI defines a research at the beginning of concept generation phase. Technologies and designs are researched before the idea generation phase. Companies and designers search for relevant knowledge about recent design and technology discourses before the generation of ideas. Designer selection is occurred after this phase. The process of research in DDI is shown in Figure 2.2.7.
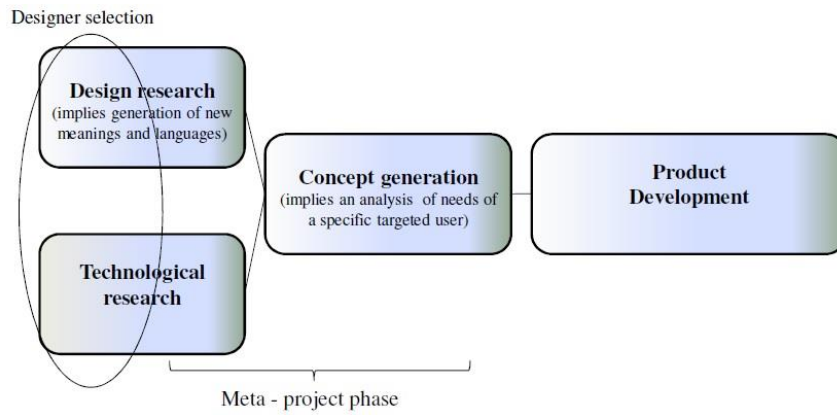
Figure 2.2.7. Design-driven innovation as a research process
(Source: Verganti, 2008)

Organization of Innovation in DDI:

DDI proposes a network based process in which several actors surrounding the firm would be get involved in the process. The knowledge sources for DDI is the interpreters defined, selected and attracted through the design discourse. The design discourse surrounding a firm is shown in Figure 2.2.8.
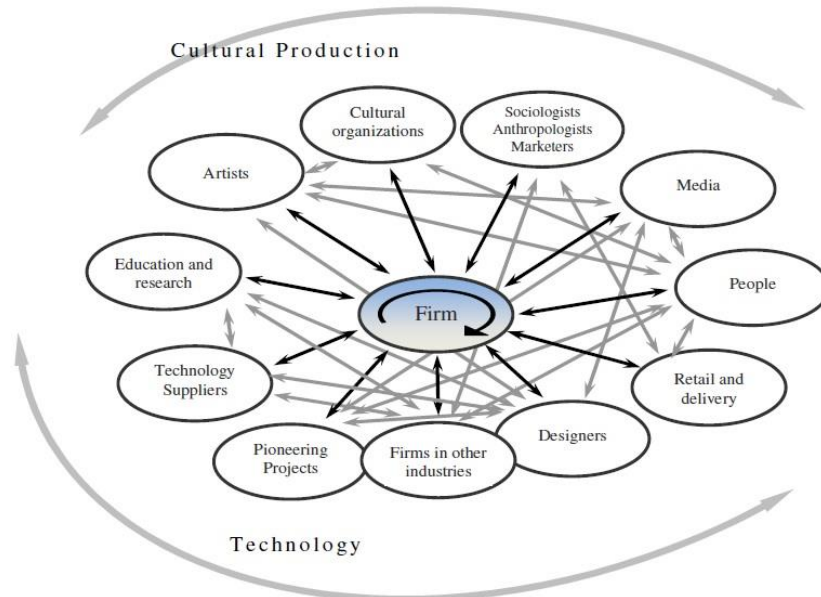
Figure 2.2.8. The design discourse surrounding a firm
(Source: Verganti, 2009)

The variety of the knowledge sources directly affects the nature of the meanings produced after the process. Technologies and cultural knowledge is diffused among the design discourse where firms try to find correct sources for their DDI process.

CHAPTER 3

METHODOLOGY

3.1. Description of Research Questions

Main objective of this thesis is to explore how furniture manufacturers develop an innovative product from its initial ideas to the end-product's market launch. However, it proposes a huge conflict to define which type of data is relevant for which issue without a perspective. Hence, design-driven innovation (DDI) theories provide a perspective to narrow down the scope. Accordingly, four main research questions are determined to be discussed and analyzed throughout this study as shown in Table 3.1.[2]

Table 3.1. Main research questions of the thesis

		Strategic	Operational	Market Entry	Organizational
RQ1	How do the furniture companies design a new product meaning for a new costumer?	▓			
RQ2	How do the furniture companies translate the design with a new meaning into a new product?		▓		
RQ3	How do the furniture companies deliver the new products into the markets?			▓	
RQ4	How do the furniture companies organize their innovation process in terms of internal and external actors				▓

Besides innovation, design is an another phenomenon discussed in this thesis through *innovation of meanings* (Verganti, 2009). It indicates a *strategic approach* of firms to the new products. Strategic decisions on the brand identity, product identity, product positioning, design approach, sustainability, cultural aspects and so on are grouped together in this domain. Moreover, DDI theories put an outline for the research for *strategic activities* in a company. It covers the approaches of furniture manufacturers to the *design* (as commercialization) which is explored through their DDI processes. Thus this thesis focuses on DDI processes to get data of strategic approaches of the case companies to design yet it underlines three stages of design process (listening,

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[2] The research questions for this study are adopted from Kembaren et al. (2014)

interpreting and addressing) which constructs the structure of strategic analysis as discussed in the following paragraphs.

New product development (NPD) processes are analyzed regarding their effect on product design as *operational* inputs. In fact, NPD processes contribute technical abilities of the companies in which they are able to add performance improvements to the products by reducing the costs (Abernathy & Clark, 1985; Roy & Riedel, 1997); differentiating the product from rivals (Roy & Riedel, 1997); and improving the functionality of the products via technological innovations adopted to the production system (Abernathy & Clark, 1985), the durability of the products with the assistance of new materials, the value of the products through considering eco-design and sustainability issues etc. Those technical abilities would be facilitated by operational changes in the production system.

Each company has a different organizational culture in which NPD processes are managed by past experiences and know-how. *Organizational structures* and their improvements are represented by variables of actors involved in the process. These variables are changed via both operational and strategic decisions so that human resources not only seek for strategic decisions on which type of experiences are need to overcome the NPD process but also for operational vote to whom would be worked in collaboration. However, the strategic decisions on organizational structure is not studied in this thesis since they represent information about *why* the companies put forward them. On the other hand we focus on *how* the companies organize their design processes.

Through this perspective organizational activities for this thesis are defined as responses to the potential organizational changes. It shapes the entire process of NPD. In fact, the collaborations with external actors of the process will assign various paths to the process in which the quality of knowledge and its transfer varies for every project. The end-products are developed through those paths affected by external and internal actors of the organization. Hence, who are the internal and external actors and how they play a role in our case studies' DDI processes is the point focused on this thesis. Thus, internal and external drivers for DDI is analyzed in terms of managerial decisions to solve an existing problem in strategic, operational and market entry phases.

M*arket entry* phase is crucial for companies to get the advance of newly designed products. Because it refers to communication with the entire market. If the new product's message cannot be introduced to the market in a well-defined strategic plan, the product's value and its *proposals* might not be received by the customers. This may

reduce the product's potential innovativeness of meanings. In addition, product positioning and segmentation would be affected by deficient correlations of the customers between new product's message and their lifestyles. Furthermore, firm's corporate identity in terms of its user segmentation is assigned with product segmentation and positioning. Hence, brand identity would be referred with communication design of the products so its market entry phases.

Kembaren et al. (2014) research for recent DDI practices in design-preneur-led creative industry. Kembaren et al. (2014) specify similar questions to answer in their research and proposes a theoretical framework as shown in Figure 3.1.1.
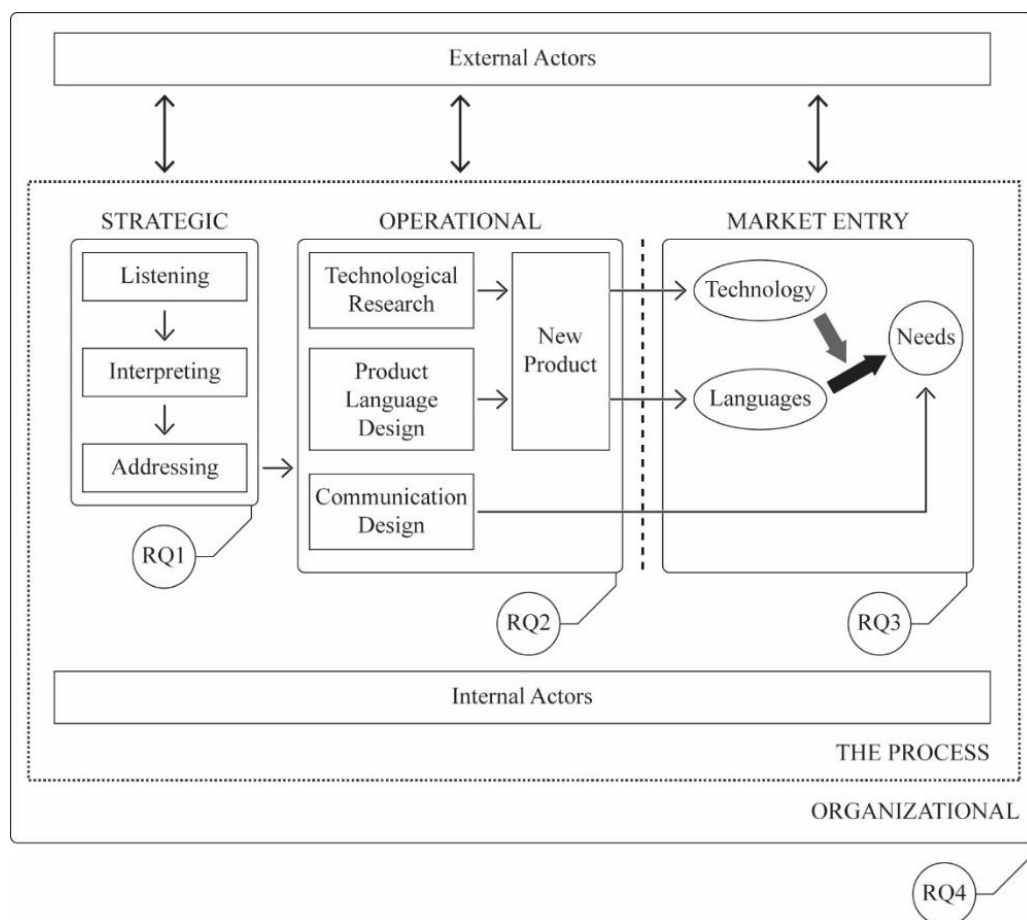
Figure 3.1.1. DDI process theoretical framework
(Adopted from: Kembaren et al., 2014)

This framework is specified as to get answers to our research questions yet it covers the whole process in terms of DDI theories. First, it identifies the process in dimensions as *strategic, operational, market entry and organizational*. This distinction defines not only a work flow of the process but also a separation between professional practices involved in the process. Meanwhile, it points out organizational activities via

defining a variety of professional experiences in DDI process. Hence, strategic dimension of the framework -mostly- meets to the design ideas and designers; operational dimension introduces NPD activities such as production and product improvements and also the technical professionals in the organization; market entry dimension reveals adopted strategies to better address the meanings of products and marketing professionals; and yet organizational dimension focuses on the organization of innovation in terms of internal and external actors.

Second, the framework draws an organizational perspective by defining professions through their level of contribution to the process as strategic, operational and market entry. In fact, it groups the organization into separate contribution levels each of which has its own organization. Strategic dimension stands for design organization; operational dimension represents organization of NPD process; and market entry dimension specifies the organization of market launch activities. Therefore the framework allows to analyze the organization of innovation in different contribute levels of the interpreters.

Third, the framework provides a clear departure to analyze the external and internal organization of DDI process. Meanwhile, it allows to differentiate the companies according to their stance to the process. Through this perspective, a company may only organize all the contributors without having an active role on the process which defines it as an external driver to the process. On the other hand, when a company undertakes the production and market entry dimensions and collaborates with external designers, the design activities turn into external drivers for the company. One another attribute of the framework at that point is that it groups the external and internal drivers in terms their level of contribution to DDI process. In fact, each phase has its own external and internal drivers. Through this framework, internal and external organization of innovation would be analyzed separately in terms of different strategic, operational and market entry dimensions.

We have divided the process and grouped practices under those domains, however, it does not mean that we collect dimension-specific data from specified dimension. In fact, all those dimensions affect each other and structures the entire process. Hence, we try to collect, analyze and validated data from other dimensions and interpret them towards various dimensions. By this way, we aim to get validation and enrich collected data regarding its relations with other dimensions.

Turkey and Sweden are selected to explore DDI practices in furniture companies. Turkey is a developing country which mostly requires exported technologies rather than focusing on R&D activities to overcome a production problem. Most of the exported products comprises of high-tech based ones like consumer electronics, production machinery, and transportation vehicles and so on. On the other hand, it has the ability to produce products that need accordingly low-tech machinery to carry out like textile, furniture, and home electronics. Moreover, Turkey exports those products to various countries representing different socio-cultural contexts like Middle East countries, EU countries, and African countries and to the countries in north Asia. Turkey tries to balance the costs of the production with low cost laboring to get advance in competition while exporting products (Ata, 2015). In fact, labor costs in Turkey is low according to the developed countries regarding low-cost production processes so that some international companies established their factories in Turkey.

Design would be an approach for Turkey to overcome the challenges in the market. Hence, design activities including fairs, conferences, workshops, panels and policies regarding governmental supports for design are improving recently. Through this idea, we defined Turkey as a case to explore DDI practices from a developing country perspective. In fact, Turkey has a geographical advantage by locating between Asia and Europe. This provides the ability to interpret various cultural knowledge towards design.

Sweden is the other case researched for this thesis since it is rewarded with being one of the leading countries in furniture design and industry with Italy (Sigolotto, 2010). We have focused on Sweden rather than Italy as there are most specific cases studied in Italy. In fact, Verganti (2009) states that it had taken a 10 years of research with Italian furniture companies as it is hard to reach to the relevant unique information about DDI strategies in Italy. Therefore, we framed our research defining Sweden as to be analyzed in terms of DDI practices.

Furniture industry is defined as the sector by which we would like to explore DDI practices. Furniture products are easy to produce since a person may produce it individually if required materials are provided. Thus, it would be carried out by developing countries with low-tech machineries and may be with low-cost laboring.

The main concern on why we focus on furniture industry is its design oriented nature. For instance, a table is used for a specific task that define some functional aspects regarding a surface and dimensions. The other criterions on a table differs according to

design approaches. As well, furniture companies try to be differentiated with designing in a new way of interpretation of their knowledge. Hence, we defined it to explore DDI practices.

Strategic Dimension:

First research question covers the strategic decisions on the idea that will lead to entire process. Critical decisions of the designers are analyzed in this dimension within three phases as *listening, interpreting* and *addressing* (Verganti, 2009). Even though Verganti (2009) proposes those phases in a networked organization in which the outcomes are produced strategically by several actors and he does not give a clear argument to define those phases as if they are only carried out by designers but additional experts; we specifically focused on the idea generation of designers in terms of Verganti's definition of process stages. Hence, we divided the new product development process into two as strategic which refers to design activities and operational that covers NPD processes of our case companies.

Listening comprises of the activities to gather idea about future trends. The proposals of the designer are sourced by this phase in which the designer gets in touch with other interpreters of design discourse. The designer seeks for ideas via her/his networks in DDI for new lifestyles and technologies. Which types of sources and interpreters feed the designer is analyzed in this session. Furthermore, resources of designers for the very first stages of idea generation are analyzed in terms of their approaches to market research, design research and technological research. Through this way, we aim to get insights of our collaborator designers' strategies since Verganti (2009) argues that technological research and design research have much more effect than market research on innovative products. As well, we would have the ability to compare those research approaches with the design managers' since they are asked for their research agendas.

The sources of innovation are proposed to be seen by asking designers about their archive systems in terms of how they are organized, their main characteristics and their access tools. Through this perspective, we would not only reach to additional information about designers' research areas but also have chance to improve and validate the data gathered from the questions framing strategic approaches of the designers.

Interpreting phase stands for idea generation of the designer in which she/he interprets initial ideas to create a vision by design concepts. The input ideas gathered

from listening phase are generated, analyzed and selected by the designer according to the specified *design brief* in this phase. The interpretation methods of the designers about deciding on the best idea to further develop is analyzed in this section.

Furthermore, internal and external actors and their effects on the current product (our case products) are analyzed in this session since they define a design brief. Although design briefs are clear statements defining the frame of the project, we aim to explore additional briefings provided by other actors like research and development (R&D) department, sales and marketing departments, and so on. Moreover, we seek for information about other external contributors regarding their assistance to interpreting phase.

We defined the new product concept as the main objective of this phase. Meanwhile, a choice of concept that is selected through an organizational arrangement to be further developed frames this phase. Interpreting phase here in this thesis differs from NPD phases by its nature representing a semi-defined product concept. In fact, NPD processes are related with improving product languages and functionalities regarding materials and production techniques. Thereby, we have separated this phase from NPD phases.

Addressing refers to the process in which product concepts would be addressed to the interpreters. Designers are responsible for the introduction of the concepts to other interpreters in a design discourse such as external producers, supply chains, other designers and engineers and so on. Product vision, future socio cultural contexts, design statements should be included to the product concept by designers to be addressed (Kembaren et al., 2014).

For this phase, we mainly focus on the tools that designers choose for communicating with other interpreters in terms of their products. How they represent the product concepts, which tools they are using, to which level they improve the concept before presentation are asked to the designers. Through this way, we aim to get insights to the strategies and tools used in conversations regarding the product. DDI proposes a network based research so that we aim to explore those aspects in terms defining them as part of communication referring a network of actors.

Operational Dimension:

Operational activities are analyzed via focusing on furniture companies' NPD processes including *technological research, product language design and*

communication design. The improvements from concept ideas to the initial products first, and yet to a *new product* is analyzed through product cases of our companies.

Technological research stands not only for the research of companies to adopt new production systems into their technical abilities but also research and implementation of recently introduced materials to the design portfolio. Moreover, process improvements for sustainability, eco-design and quality certifications are operated in this dimension.

Product language design represents the process of (*re-)*designing the product in terms of corporate identity, product segmentation, ergonomics, material selection and technological additions to the product concept. In short, it implies further development of the product according to the company's product profile regarding the product language to express the product *message* better.

Both designers and design managers are asked to define their product language design approaches. Designers are expected to cover the initial idea processes in terms of product language design while design managers are selected for gathering information about the effects of operations on the product concept.

Through this way, designers and design managers are defined as two separate sources of information about NPD process. Both of them are asked to specify the process from prototyping to market-entry phase. This approach would not only enriches the data collection but also enhances the validity of this study accordingly.

Communication design focuses on the strategies to better deliver the new value embedded in products to the market (Kembaren et al., 2014). The companies' approaches and tools are analyzed in this session by interviewing with design managers. The designers are also asked for giving information about their communication approaches at the very beginning of the process. It is differentiated from addressing phase in strategic dimension with its coverage of product standardization, feedback management, sales and after-sales services, advertising channels and activities; in short, its nature characterized by activities that would be defined as *storytelling* (Kembaren et al., 2014) activities. On the other hand, addressing phase comprises of realities about the product idea like its concept and their initially improved solutions that would be tested through prototypes. Hence, we aim to interpret those different data in terms of communication design activities.

Market Entry Dimension:

Market entry phase represents market launch process of the products. How the furniture companies launch their products are analyzed in this dimension.

Organizational Dimension:

Organizational analysis comprises of *internal* and *external actors* who are *selected* from design discourse by companies and involved in DDI process. Since DDI has a networked strategy in which these *actors* contribute to the process (Sigolotto, 2010), organization of DDI is discussed within various dimensions in theoretical framework. For the strategic dimension, they are analyzed through designers' perspective. Operational dimension regards organization of innovation as that of research and development (R&D) departments, and designer portfolio, supply chain and co-design. The former two are represented as internal actors while the latter two are determined as external drivers. Because furniture companies are defined as the organizers of the whole process whether they are actively involved in the process or not and as the products are mentioned with them at the end.

Our approach to this dimension is to get insights about our case companies' network management procedures. Meanwhile, by exploring various organizational settlements, we would better propose suggestions in term of DDI theories. In fact, knowledge transfers, types of data transferred, the characteristics of communication between interpreters, critical meeting structures and their outcomes are analyzed in this section.

3.2. Research Approach

An exploratory approach is internalized through this thesis to answer the research questions. In fact, the goal of this study to uncover the applications of DDI theory in practice to test and further develop the theoretical literature with evidences from one of its application areas. Both quantitative and qualitative data is gathered to be analyzed in terms of this approach aiming to discover recent practices of furniture companies in different cultures. The former is reviewed and discussed through an *activity based* approach to the innovation in which country level innovation performances are analyzed according to the national innovativeness reports. By means of those activities and policies held by Turkey and Sweden, not only national clusters

and their characteristics surrounding design discourse are revealed to frame DDI activities in their nature regarding how furniture companies synthesize their strategies accordingly; but also limits and restrictions in different innovation performance levels are explored regarding that Turkey is a growing country with respect to Sweden's developed establishments of innovations. In fact, this approach reveals a problem statement for this thesis which focuses on DDI approaches and applications in Turkey as a developing country while analyzing the results from an accordingly developed country that is well known with its design culture leading to a socio-cultural context fed by Scandinavian design style. Furthermore, qualitative data is gathered and analyzed through an *output* innovation approach to explore the recent practices and applications of DDI theory adopted by leading furniture companies of Turkey and Sweden. Hence, firm level innovation practices analyzed by a qualitative approach and its national drivers explored quantitatively are framed to get insight to the DDI theory from a broader perspective in which we may relate the practices to those drivers.

Case study research tools and methods are applied for the exploration of DDI practices in furniture industry in this thesis. Case study research provides an understanding of a phenomena within a bounded system in which various data sources like documents, observations and interviews are generated in a contextual and historical framework to determine and describe the prevailing processes of the phenomena (Aten & Denney, 2014). Patton (2002) defines prior function of case study research as "to gather comprehensive, systematic, and in-depth information about each case of interest." It also endeavor to consolidate empirical data with theory (Aten & Denney, 2014).

Multiple case studies are analyzed through the process in which we focused on strategic, operational, market-entry and organizational dimensions of DDI practices adopted by furniture companies in macro level. Because each dimension needs further detailed research with its coverage of various inputs, outputs and actors that would require in-depth research individually. Instead, we draw a theoretical framework whose main focus is defining DDI practices and yet, we analyzed the process through above dimensions framing DDI theories. Therefore, our approach to the case studies covers analyzing DDI practices via dividing the process to separate dimensions and exploring each of which within the statement orienting DDI as to be the macro phase of all. Through this perspective we may assume that there would be critical organizational practices between those dimensions since each dimension provides a dynamic

mechanism that would be separated from others with its characteristic and tools used in its emergence. Meanwhile, the organization of DDI practices of case companies is analyzed via focusing on the organizations established between those dimensions. Hence, while transferring the information and product (or concept) from one dimension to another, critical decisions on product design are accepted by actors involved in the phase. For instance, when design concepts are introduced to the organization by designers, the design process in strategic dimension is followed by operational phase. The organization between strategic and operational phases takes critical decisions on product concepts which defines a concept as to be the *best* product idea to be launched or the ignorance of the company's strategic approach. Thus we assume that critical changes on ideas (meanings) or design concepts (product languages, functions, meanings) are finalized for other phases in these organizations and yet, we mainly focus on those to explore the product meaning changes.

Accordingly, this approach provides a scheme for DDI process in which we may propose a funnel model for meaning changes as shown in Figure 3.2.1. The top of the model comprises of ideas that would be generated by designers. The ideas are interpreted to create product concepts while after a selection process that narrows down the ideas to be coded in product concepts. Addressing phase covers the addressing of design proposals to the interpreters where the meanings are selected throughout the strategies of the furniture company. A dramatic change in product meaning is expected after this phase by deciding on which proposals and product ideas would be focused on to be developed through operational phase. The dimension, materials, production techniques and meanings of design are much more specified in operational phase according to the company's product profile and future plans.

İdeas

Design
Brief

Listening

İnterpreting

Adressing

Product
Language Design

Communication
Design

New
Product

Market Entry

Market
Entry

Strategic

organizational

Operational

organizational

Meanings and products
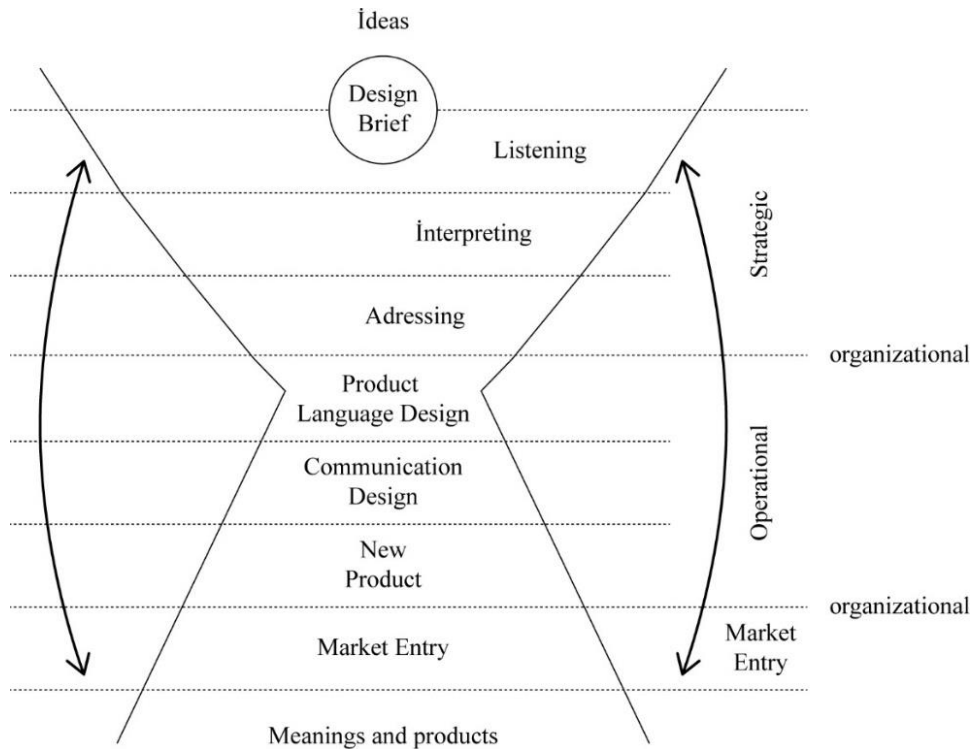
Figure 3.2.1. Transfer and orientation of ideas to products and meanings in DDI process (Source: The author's own conceptualization)

Communication and product language design phases comprise of design decisions on how to introduce the proposals provided by the product to the interpreters and markets. In these phases, companies are expected to be focused on addressing the propositions and product meanings by generating linkages between those propositions and recent (or future) daily life contexts. Thus, we propose a planned meaning introduction and integration which define connotations between the product and life contexts. The connotations here are to make the interpreters get insights to new product meanings so that we may argue that meanings of newly designed products are empowered with these connotations. They are enriched and oriented to the life contexts by giving references to proposed user needs. Hence, the funnel model turns into upside down regarding a planned increase in product connotations. The meanings of newly designed product are supported and developed through incremental improvements on products, and its segment by adding new products framing the proposed meanings after the first products' market-entry phase.

This model defines a cyclical transfer of knowledge from recently developed products to new ideas. In fact, the outcomes of DDI process reveals new ideas for new product proposals.

Throughout this approach, it would be beneficial to determine a product case to be discussed and analyzed for each company. Putting the object as a case and defining a process accordingly represents an organizational scheme in which we may find a variety of information about the external and internal drivers of the process but the organization of innovation. Because end-products are developed by various internal and external actors and by interpreting the data they provide to the organizational analysis of the same process, we may get empowered insights to the organizational settlements. In fact, innovative products are developed through a process in which there is a unique knowledge transfer between the interpreters. The success of this transfer is related to the network and communications of the actors so especially to the selection of *right* actors for the specified process. In a similar sense, it would be implied that *new product* is designed, produced and launched to the market via efforts of various interpreters to get in touch with the *right* actors. Companies which define design as its core strategy are trying to get advance of design value they introduced to the interpreters. Thus, they are in challenge to get the best solution to a design problem so to include the *right actors* to the process.

Hence, this perspective not only provides a variety of information about the organization of innovation, but also improves the validity of the research since it defines NPD process as a collaborative work in which there are different internal and external sources of data. Designers and design/product managers are selected as interviewees to gather information about a specific product case's process and organization of this process (*see* Figure 3.2.2).
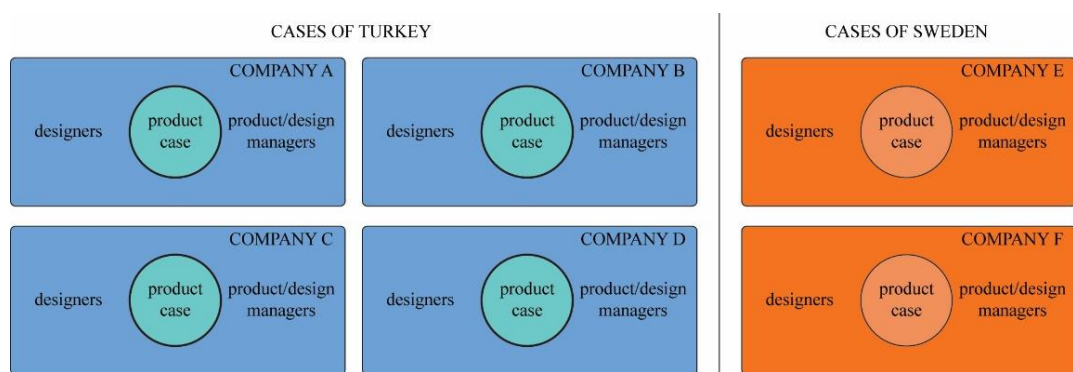
Figure 3.2.2. General research structure
(Source: The author's own compilation

Research validity is provided via asking some common questions to both designers and design/product managers of our case companies. Furniture companies are

defined as the organizers of the whole process whether they are actively involved in the process or not because the products are mentioned with them at the end.

A qualitative approach is internalized during case study research process. In fact, we aim to explore each company's strategies and practices in terms of DDI via searching about qualitative data that would open up new ways to the theoretical ground. Moreover, we would propose some evidences to test the theory in practice by the nature of qualitative research providing individual insights to the problem of matter through conversations.

The company cases are analyzed through a cross case analysis procedure in which we collect and discuss evidences from Turkey and Sweden. This approach does not reveal a comparative analysis but the evidences are analyzed in their design discourses. As well, we reviewed the literature about Turkey and Sweden in terms of their innovation capabilities and design cultures. The quantitative data about competitiveness and innovativeness levels of those countries refer to the technological clusters surrounding design discourse. Through this way, we would get insights about the recent national practices on innovation. Here, we assume that the improvements on innovation and innovation policies of countries create a developed culture by which design discourse is affected accordingly. Therefore we have related the innovativeness levels and design discourse in this way to frame the research outcomes regarding national level practices on the adoption of DDI theories in furniture industry.

Furthermore, qualitative approaches about design cultures of Turkey and Sweden are reviewed from academic literature to propose evidences about national design discourses. Through this approach, we aim to specify the recent practices in design discourses in which our case companies provide new products. These design discourses reveal mainly the market structures covering recent trends, design perceptions of the customer groups and product language characteristics of the products introduced to the markets and so on. By this way, we aim to draw a frame to the strategic approaches of our case companies to their DDI practices.

3.3. Selection of the Cases

The case companies are determined through their designer portfolios and the number of international sales offices and agencies or dealers. We propose that the

former represents a strategic approach to design by a network based research agenda in which the companies collaborate with several designers to create new products. It defines the company's vision regarding design as a critical dimension of the process as the furniture companies collaborate with designers. On the other hand, the latter reveals information about the company's recent situation in the market. For instance, variety of countries that furniture companies export their products would refer to both the companies' strategic approach to design and in a sense, a competitiveness portfolio of them regarding international market abilities. Through this approach, we would define companies that compete with each other in same markets especially EU countries for Sweden and Turkey. We assume here that those companies competing in the same markets would focus on design strategically to be differentiated by it and they mostly have the ability to cope with different design practices. Hence, we have defined the second criteria as the quantity of those international representatives for selecting the case companies in both Turkey and Sweden.

Even if we have considered some international competitiveness and innovativeness reports regarding Turkey and Sweden, we are not interested in those quantitative data while defining the case companies. In fact, that is why we have reviewed innovation literature within *output* and *activity* based approaches. We define the former approach for covering the outputs of firm level activities while considering activity based approach as it refers to national innovation activities and policies. Through this perspective, we aim to reveal a product based approach which entails design activities. Hence, the outputs of the companies are regarded with their products rather than the companies' patents, number of labors working in, production capacity, sales rates and so on. In fact, some of those criterions are used in reporting competitiveness and innovativeness reports of the countries; however, there is no reference to design especially design for emotion.

Through those criterions, a research is conducted in Turkey to define case companies. Various statistical databases like furniture association reports and Turkish Statistical Institute reports are reviewed to get insights to the industry and its leaders in terms of sales, exports, improvements etc. After having information about brand names and their facilities, an internet research is conducted to determine those companies' designer portfolios first. This research is conducted via a company website scanning process to explore their design portfolios. In fact, our prior focus is designer portfolio

since this thesis is framed with design and it would provide us a level of contribution to DDI theories.

Through the internet research and self-observations, we have found that most of the domestic furniture companies have not yet established an approach to design representing their designer portfolio on their websites. In addition, their websites are mostly characterized with sales and after-sales service applications, dealer information, cost reduction news and so on. As well, their priory to this approach is may be their target customers who will interact with their products.

We have found that most of the designer portfolios we got information about are commonly found in office furniture industry. In fact, in the office furniture industry, there would be a distinction between the customers and the users of the products. Companies are the main customers of office furniture but whose workers constitute the user group. Furthermore, companies try to emphasize their vision and brand value via their interior office environments (Ebeş, 2014). Those distinctions create a *niche market* in which design is the main concept for satisfying not only the end-users by providing an office environment but also the customers via enhancing their abilities of brand communication (Ebeş, 2014). Therefore, office furniture companies are defined as to be researched since they create new products to a niche market regarding various inputs to design discourse.

During the testing process of interviews, Ebeş (2014) suggested an international design database called Architonic which comprises of designer and company portfolios in several countries regarding various areas in furniture and architectural design. We have defined Architonic as the third criteria for case selection since it represents an international classification regarding design and production quality.

Throughout above statements, case selection criterions are listed in order below.

I. Architonic database listing

II. Having a section introducing collaborated designers

III. Number of designers collaborated with

IV. Number of international sales agencies, dealers, representative offices etc.

First, we research for Architonic databases to get the most impressive furniture companies listed under Turkey and Sweden. We defined 3 companies in Turkey (Nurus, Ersa and Enne) and 48 in Sweden. Throughout further research we have excluded 33 companies from the Swedish companies list for this thesis since some of which produce household accessories, lightning furniture, furniture accessories, only a specific group

of products like shelves, curtains and carpets. Furthermore, we excluded some companies as they organize sales practices for several manufacturers under a brand name.

We have get contacted with 15 of those Swedish companies (*see* Table 3.2) 6 of them did not want to get involved in this research while other 7 has not responded to our emails, messages from social platforms like Facebook and LinkedIn or phone calls. Even we have tried to get contact with them via Samir Khoshaba a professor at Linnaeus University, we got negative responses so that we have carried out the research with Skandiform and Offecct for Swedish case analysis.

For the Turkish cases, we added Koleksiyon, Burotime and Tuna Ofis to the list. Koleksiyon is the suggestion of the thesis advisor Prof. Önder Erkarslan since they have an improved design strategy on office furniture. Burotime is the market leader of office furniture industry in terms of sales in Turkey (Kızıltuğ, 2015) and they fit to our other selection criterions like Tuna Ofis.

Table 3.2. List of proposed case companies in Sweden
(Source: Company websites)

		N. of Designers	N. of Awards (2010-2015)	International Offices, Dealers & Retailers	Memberships & Certifications	Fairs / Events Involved in	Collections
REJECTED	Abstracta	19	NA	NA	ISO 14000, ISO 9001, OHSAS 18001, FTI, Möbelfakta,	Orgatec, Stockholm Furniture & Light	Acoustics, Meetings, Storage
	Blå Station	22	10+	21	Nordic Ecolabel, Möbelfakta, ISO 9001, ISO 14001, REPA	Orgatec, Stockholm Furniture & Light, Salone del Mobile, Designjunction London	Tables & Chairs, Sofas & Benches, Storage, Acoustic Panels, Stools and so on
	Gärsnäs	19	NA	13	ISO 14001, Klimatdiplom 2013	Neue Räume, Salone del Mobile, Stockholm Furniture Fair	Tables & Chairs, Sofas & Benches, Storage, Stools, Easy Chairs, Accessories, Lamps
	Karl Andersson	44	NA	25+	Möbelfakta	Stockholm Furniture Fair, Designers Saturday Oslo,	Tables, Display systems, Srotages, Coat rocks, Sound absorbers, seatings
	Mitab	20	NA	3	ISO 9001, ISO 14001	Designjunction, Stockholm Furniture Fair, Clarkenwell Design Week, London Design Week	Tables, Accessories, Easy chairs/sofas, Chairs/stools
	Swedese	23	NA	31+	ISO 9001, ISO 14001	Clarkenwell Design Week, Designers Saturday Oslo,	Chairs & Armchairs, Easy chairs, Sofas, Stools and Benches, Tables, Miscellaneous
NOT REACHED	Asplund	9	1	50+	NA	NA	Carpets, Storage, Desks and sofas, Chairs, Accessories
	Balzar Beskow	7	NA	NA	ISO 14001, Svanen	Salone del Mobile, Orgatec, Stockholm Furniture Fair	Tables & Chairs, Sofas & Benches, Storage, Auditoriums, Stools

Table 3.2. (Cont.)

NOT REACHED	Horreds	13	NA	7+	Möbelfakta, Dela, ISO 9001 2008	Salone del Mobile, Stockholm Furniture Fair	Working desks, Storage, Conference, Seating, Coffee Tables, Accessories
	Johansson Design	9	NA	27	ISO 14001, SP Technical Research Institute of Sweden, Möbelfakta, Eco Label	NA	Chairs, Armchairs, Barstools, Tables, Sofas, Sound absorbers, Accessories
	Kallemo	20	1	9	NA	NA	Chairs, Shelves, Tables, Sofas, Easy Chaies, Accessories
	Lammhults	7	NA	42	Möbelfakta, Nordic Ecolabel, ISO 14001, ISO 9001, OHSAS 18001	Stockholm Furniture Fair	Barstools and stools, Bar tables, Chairs and armchairs, Easychairs and sofas, Accessories
	Röshults	10	NA	29+	NA	NA	Outdoor furniture, Outdoor kitchen, Storage, Fire baskets, Indoor furniture
ACCEPTED	Offecct	43	24	50+	ISO 9001:2008, ISO 14001:2004, ISO 26000, Nordic Ecolabel, Möbelfakta	Designjunction, Stockholm Furniture Fair, Clarkenwell Design Week, London Design Weesk	Easy chairs/chairs, Sofas, Barstools, Tables, Acoustic panels, Room dividers, Accessories
	Skandiform	12	2+	50+	FSC, Möbelfakta, ISO 26000	Stockholm Furniture Fair, Designers Saturday Oslo, Milan Design Week	Chairs/Armchairs, Easy-chairs/Sofas, Tables

Table 3.3. List of proposed case companies in Turkey
(Source: Company websites)

REJECTED	Koleksiyon	16	NA	18+	ISO 14000, ISO 18001, SAP/3, BW, CRM erp, ISO 9000-2000.	Design District NL, Office Next Moscow, Dubai Workspace	Openwork series, Desk systems, Storage systems, Office chairs, Armchairs, Sofas, Partition walla, Coffee tables, Lighting, Carpet/rug
NOT REACHED	Enne	3	NA	4	NA	Salone del Mobile, Dubai Index	Sofas, Chairs, Armchairs, Tables, Low tables, Bookshelves, Console
ACCEPTED	Nurus	37	35+	27	ISO 9001, ISO 14001,	Orgatec Furniture Fair	Executive series, Performance task chairs, Work systems, Armchairs/sofas, Chairs, Storage systems, Accessories, Wall-dividers, Meeting-conference, Lounge
	Ersa	18	23	NA	ISO 9001:2008, ISO 14001, ISO 10002, OHSAS 18001, Q MARK BS 476 Part 22	Orgatec Furniture Fair	Executive offices, Office systems, Office task chairs, Chairs, Waiting units, Conference hall chairs, accessories, Metal storages,
	Tuna Ofis	14	NA	NA	NA	Orgatec Furniture Fair	Visitor chairs, Multipurpose chairs, Lonnge, Executive series, Operational series, Meeting tables, Sofas, Coffee tables, Storage units
	Burotime	21	NA	43	ISO 9001, ISO 14001, ISO 18001, Turquality	Orgatec Furniture Fair	Office furniture, Office chairs, Soft seating, Waiting units, Panel systems

3.4. Data Collection Tools and Procedures

Semi-structured interviews are conducted with designers and design managers of our case studies. The former is selected to explore the strategic dimension of DDI practices since their strategies to *listen* to the design discourse, methods to *interpret* the ideas and tools to *address* the product concept are analyzed within this interviews. On the other hand, design managers are defined as to get data about companies' operational practices that comprises of the companies' approaches to innovation, NPD processes regarding product language design and communication design, and organization of the process. In fact, we assume that design/product managers are responsible for the entire design management process in our cases. For our cases, the interviewees are listed in Table 3.4.

Table 3.4. List of the interviewees

	Company	Designer	Product Case	Design/Product Manager
TURKISH CASES	Nurus	Ece Yalım *External designer*	Pitstop	Gün Acar *Designer*
		Oğuz Yalım *External designer (interior architect)*	Dodge	
	Ersa	Ece Yalım and Oğuz Yalım	Frame	Yalçın Ata
		Şule Koç *External designer*	Geo	
	Tuna Ofis	Sinan Ozan Tığlıoğlu *Internal designer*	E-Motion	Sinan Ozan Tığlıoğlu *Designer*
	Burotime	Utkan Kızıltuğ *Internal designer*	Bistrodern	Özge Çağla Aktaş *Designer*
		Arif Akıllılar *Internal designer*		Utkan Kızıltuğ *Designer*
SWEDISH CASES	Offecct	Khodi Feiz *External designer*	Palma	Ander Englund *Designer*
	Skandiform	Oliver Schick *External designer*	Stripe	Niklas Dahlman

Semi-structure interviews are used to gather data since it would represent a wider perspective providing the interviewees' interpretations approaches around a specified subject. In fact we have grouped the interview guide questions under specific dimensions. Interviews with external / internal designer(s) are carried on the topics:

    I.   General Issue

    II.   Listening (Design Research)

    III.   Interpreting (Concept Generation)

    IV.   Addressing

V.   Tech Search & Development

VI.   Product Language Design

VII. Communication Design

VIII. Product Development Process

Interviews with product / design manager(s) are carried on the topics:

I.   Innovation Perception & Scope

II.   Innovation Strategies

III. Internal Organization of Innovation

IV.   External Organization of Innovation

V.   Design Process

VI.   Process Development

The first stage for data collection is getting contact with the companies' product/design managers to define product cases. They are asked to define products that would be innovative in terms of design creating a destruction in the companies' product range. After this process, designers of those products are tried to be contacted. In cases we could not reach to the designer(s) of specified product cases, we focused on other products that are defined by design managers. Main objectives of those group of guide questions for design managers are summarized in Table 3.5.

Table 3.5. Objectives of interview questions with design/product managers

	Interview guide question	Objective / Scope / Attribute
Innovation Perception & Scope	What are the main innovative characteristics of your products?	To understand the perspective
	Which of your products is the most innovative one in terms of design, why?	To define product case
	What are the main differences between your company and national / international competitors in terms of being innovator?	To get insights about current position of the company
Innovation Strategies	Which of the followings has much priority in new product development (NPD) process? Why? Market research Technological developments Design ability	To get data about research agenda Scope of research
	What are your most prior criteria at the beginning of NPD process like aesthetic, longevity, cost, functionality etc.?	To get data about product agenda
	What are your main strategies to attract customers?	Communication and marketing strategies

Table 3.5 (Cont.)

Internal Organization of Innovation	What are the main characteristics of communication between departments; formal or informal? What sort of data is transferred between departments? How?	Communication characteristics
	Which departments have an active role in NPD process?	Internal actors
	Do you have a laboratory for testing and prototyping?	Testing and prototyping organization
	Which departments have responsibilities in this laboratory? Could you define these responsibilities briefly? How do they communicate with each other?	R&D organization
	Do you create different groups for different projects or is it strictly defined	Improving internal organization
External Organization of Innovation	Which external actors do you communicate with and which supports do you get?	External actors and their contributions
	How is this communication processed? Who has the active role for this communication?	Language brokering and knowledge transfer representatives
	How often do you communicate with them?	Communication sequence / periods
	How do these actors affect your design process and strategy?	External actors' contribution level
	Do you have a designer portfolio? How do you create, organize and develop this portfolio?	Portfolio management
	How do you define and attract the 'right designer' for you?	Designer selection criteria / designer portfolio improvement
NPD and Design Process	How do you organize your design process? Do you have an editorial line for your design process? Which stages does it have?	NPD process and its organization
	How do you evaluate the prototypes?	Prototyping and testing procedures / characteristics Product language design
	What are the designer responsibilities?	Designer expectations
	Do you have alternative strategies to solve the problems in NPD process? Could you give an example?	NPD strategies
	How do you evaluate the product concepts in NPD process? Do you have a method?	Evaluation tools and methods
	In which stage you attend to the fairs, why?	Communication design
Market-Entry	How do you launch your products? Briefly define your product launch strategies. (Books, magazines, fairs, exhibitions, workshops etc.)	Market launch strategies and tools
Process Development	How do you evaluate recent projects? Do you organize feedbacks?	Know-how management and organization
	How do you specify, develop and integrate new techniques?	Technological research

Main objectives of those group of guide questions for design managers are summarized in Table 3.6.

Table 3.6. Objectives of interview questions with designers

	Interview guide question	Objective / Scope / Attribute
General issue	Do you collaborate with specific firms regularly?	Collaboration persistence
	Do you have a portfolio of firms from various sectors? Which sectors?	Sector variety
	How do you communicate with firm departments? Do you have a role of bridging the departments of collaborated firm?	Communication characteristics
	What are the expectations of the firm?	Designer expectations / Designers' portfolio
	Do you develop (and produce) projects for your own company?	Scope of design and/or branding
	Do you create different groups for different projects or is it strictly defined?	Knowledge variety in various projects
Listening	How do you search for ideas containing new or radical product/services meaning?	Research tools and methods
	What kind of information are you looking for? Which sectors do you follow mostly?	Research resources and variety
	Where do the external sources of design come from? Which external actors do you communicate with and which supports do you get?	External actors as a resource of design ideas
	Do you have a portfolio of external actors? How do you manage and develop?	Actors' portfolio management
	Do you attend any kind of design expert community, association, or club meeting, physically and/or virtually? How often?	Institutional sources of innovation
	Do you attend any kind of activities like conference, panel, seminar, exhibition etc.? Are all they are about design?	Organizational sources of innovation
	Do you have an archive system for your design and technology research? What can you say about its main characteristics?	Archiving tools and methods
	How do you sense and search for relevant technology?	Technological research
Interpretation	How do you compile and systematize all information you obtained from sensing the activity / activities above?	Interpretation tools and methods
	From the compilation of ideas and new trends mentioned above, how do you select the most promising one?	Concept selection tools and methods
	How do you develop new product vision (proposal) from the selected best idea?	Tools and methods used, strategies adopted
Addressing	How do you address your product to the other interpreters?	Introduction method of the product concept
Tech Search & Development	How do you translate a new product vision (proposal) into technology requirements?	Technological research and perspective of concept ideas
	How do you search and/or develop technology required to realize the new product vision (proposal)?	Technological research and improvements for product concept
	Do you have a laboratory for testing and prototyping?	Research center for testing, improving and communicating

(Cont. on next page)

Table 5.6. (Cont.)

Product Language	How do you translate the product vision (proposal), especially related to new product meaning into product language design?	Product language design; priorities, research, sources	
Communication Design	How do you translate the product vision (proposal), especially the new product meaning into a communication design? How do you communicate with customers to introduce new vision?	Communication design	
Product Development	How do you integrate the results of technology searching, development and product's language designs into a new product?	The organization of NPD process	
Process Development	How do you evaluate the product concepts' prototypes? Do you have a method?	Selection methods for prototypes in NPD process	
	What is your most prior criteria like aesthetic, longevity, cost, functionality etc.?	Selection methods for product concepts in NPD process	

Data verification procedure comprises of asking common questions both to the designers and design managers across a defined product case. Here, our approach represents the specific information covering the product cases' entire process. Design managers are represented here as one of the major actors in entire process since they manage it. They are asked to their company's recent approaches to innovation and its position in the market regarding innovation so that we would get their insights to local and global markets, but strategies adopted accordingly. Moreover, we search for their information sources regarding which type of research they conduct. In addition, their criterions on product concept selection and improvements are asked to frame the innovation process from product perspective. Furthermore, design managers are expected to define the organization of entire design process in terms of internal and external actors involved in. Here, we seek for information about their type and level of contribution to design and its completion. The NPD processes from idea generation to market-entry phase are analyzed throughout prototyping strategies, production improvements, testing tools, material selection and the most critic strategies for those and other aspects of NPD process. Information about product language design strategies are gathered throughout the conversation referring material and production techniques applied to product concepts. Communication design strategies are revealed throughout the entire conversation and some specific questions in strategic dimension of the interview. Furthermore, know-how and its organization are the other questions we aim

to get answers to get insights about the corporate culture in terms of implementing and diffusing corporate knowledge and culture.

In fact, we define designers as the most important actors of idea generation phase in which we search for sources of innovation; how they interpret data they gathered especially regarding external actors to reveal the networks of designers; and the tools and methods they use in terms of *addressing* the ideas to not only the interpreters that are actively involved in NPD process, but also other external actors like suppliers, engineers, consultant companies, laboratories and so on. Here, our approach is to explore the strategic, operational and communicative dimensions of idea generation phase. Moreover, communication design and product language design decisions are asked to designers to define their strategies and tools used on product meanings. Besides these data, we search for information about the entire process covering external and internal organization of innovation through designers' perspective.

The interviews are conducted by mostly face-to-face conversations in Turkey. The interview data is recorded by sound record devices. If we would not arrange a meeting with interviewees, a Skype call is used as a method and the conversations are recorded by Debut Software which captures the on-progress applications on computer screen. The interviews with designers from Sweden are held by e-mail interviews since it was hard to organize the time for a Skype conversation. The questions are further explained by e-mail for those e-mail interviews. For all cases except e-mail interviews, the questions that are answered before asking have omitted if the interviewees have not anything to add.

The initial results are asked to both designers and design managers to check if there are statements that does not fit to the company. Through this process, data is not only checked but also validated by the interviewees. In fact, for the Turkish cases, a confidentiality agreement is formed for each company and contracted with design managers.

3.5. Data Analysis Methods

Both interviews are organized to first getting the overall information, then focusing on the product case as an instance to them. Through this way we would have

chance to collaborate those interview data to outline the DDI practices adopted in our cases as shown in Figure 3.5.1.
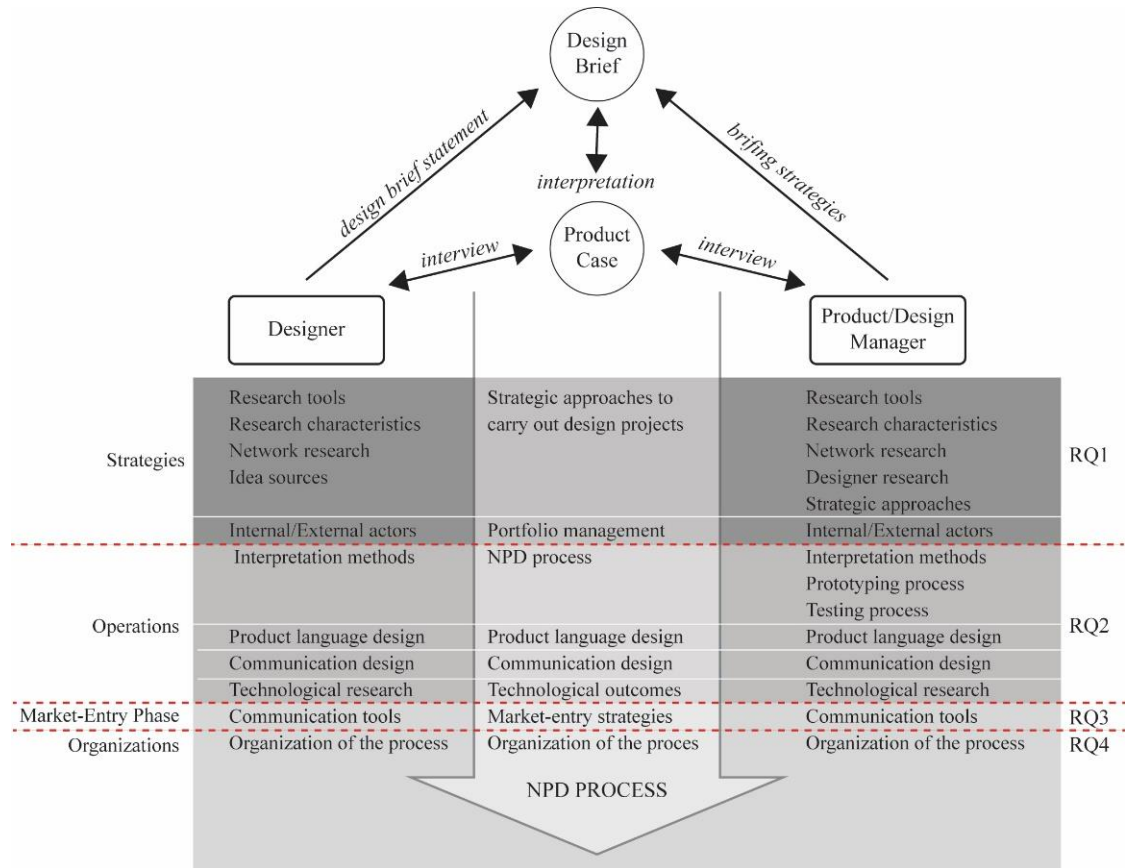
Figure 3.5.1. Data verification and interpretation scheme for interviews

The left side of the scheme represents the designers' answers while the right side summarizes the data of design managers. The product case here is defined to verify those data via comparing and contrasting them.

All data about a company is analyzed through grouping information in terms of our theoretical framework regarding strategic, operational, market-entry and organizational dimensions of innovation process. During this process, some common procedures are detected for each company. They are analyzed but not stated in individual case results; instead, we discuss them at cross case analysis section.

3.6. Analysis of Turkish Furniture Case Studies

3.6.1. Nurus

3.6.1.1. Strategic Dimension

Innovation Approach:

Various drivers such as internal managers, design ability, production capabilities and norms (standards) would propose a DDI approach for Nurus (Acar, 2015). Managers are the brokers of language in their expertise area and their insights to the future contexts have a crucial role in Nurus. Furthermore, Nurus collaborates with 30 external designers by whom they get insights to different approaches of design and visions for future contexts. Those designers' visions and proposals for next generations are the drivers in this domain. For instance the product *Picnic* (Nurus Furniture, 2015c) (*see* Figure 3.6.1) by Ece Yalım Design Studio is the regeneration of a cultural phenomenon outdoor picnic table by which users are able to communicate, share, do activities together in an informal environment. Acar (2015) states that sometimes they may have products new to the global market but they are not good at marketing. Hence a couple of years after they would see products of competitors that are well-known with their concepts firstly introduced by Nurus. Moreover, their production capabilities enforces design ideas to be produced in a short time with a low cost. Because Nurus has an improved production line in which desired forms would be produced with the help of computer aided design (CAD) tools since Nurus tries not only to be differentiated by its production quality, but also to gain a competitive advantage of improved production line (Acar, 2015). One another driver for Nurus to innovate is the norms given by some countries as a standardization (Acar, 2015). For instance, a norm of "adjustable table height" would drive the strategies of Nurus to design for this specified problem, and then adjust its outcomes to other products. Moreover, implementing technological adaptations by adding supplements to the existing products or improving their production techniques is one another approach by which Nurus tries to get advance.

Figure 3.6.1. Picnic; Designed by: Ece Yalım Design Studio
(Nurus Furniture, 2015c)

One main implementation Nurus focuses on is the internal design laboratory called "Nurus Design Lab" (Nurus Furniture, 2015b) in which the designers work on mostly prototyping and improving the initial products in an open office environment. Acar (2015) underlines that this office environment provide them an informal communication platform which fits to the nature of design.

Market research activities in Nurus comprises of improving knowledge about market situations regarding recent customer and producer trends, home furniture industry, office activities, architectural trends and so on. Therefore a user-centered approach is internalized in Nurus. But, market research does not include these domains in terms of imitation or satisfying the current user, rather, it is an external data interpreted by internal design, marketing, sales and purchases, planning and production executives to draw a strategic approach for defining future trends. Such trend forecasting activities generate the product design strategy sourced by market research. Acar (2015) states: "To forecast the trends, following the trends is a must." In addition, market research data is used to ground the future plans.

Technological research for Nurus defines areas in which there would be improvements in production techniques. CAD operations are the tools that Nurus uses in its design process to see the initial prototypes and interpret them as to be a Nurus qualified product (Acar, 2015). Cost reduction is the main driver for technological research in Nurus hence they focus on product design in terms of designing the details and finishes as to be produced with low-cost techniques. Acar (2015) defines their design strategy for this perspective as "to design in a way without stealing material and

injuring the product language". In fact, they try to develop their production systems that allow an advanced prototyping laboratory and an ability of producing furniture with perfect finishes (*see* Figure 3.6.2).

Figure 3.6.2. Edgar low-table by Nurus. Bending and fixing the metal with wooden table surface is a hard work without CAD tools (Source: Nurus Furniture, 2015a)

Besides cost reduction, Nurus tries to create a brand identity referred to its production quality. Material technologies that are introduced by suppliers are the other sources of design in Nurus. Furthermore, external collaborations with testing laboratories like Reinhardt Reinhardt (2015) provides knowledge about product functionalities and material properties and their relations. The main resource for information about technological and market research is the fairs like other many furniture companies.

Design research for Nurus mainly refers to *designer research*. The process starts with an interpretation of recent market trends to outline future trends. After trend forecasting, a designer research is applied through internal and external databases. Internet and personal communications are the main sources for this designer research. The designers' recent projects, her/his experience on outlined trend forecast and her/his fame are considered in terms of defined trends. For instance, if a *working chair* with various parts is to be designed, Nurus focuses on designers who has experience on ergonomic seating and provide a prototype to reduce the time spent on NPD process so as to save money. Besides that, Nurus accepts design ideas to select the most astonishing one according to their trend forecasts. The purpose of the firm is to catch the *best ideas* before their competitors and thus to be the first producer of that concept. In other words,

Nurus tries to propose a strategically defined trend and group related information about expert designers on that area, recent trends, competitor analysis, and marketing data under this specific trend proposal so as to carry on the projects by choosing the *best actors* and *ideas* that fit to its strategic plan.

Design approach of Nurus would be divided into two main parts; one catching the best ideas regardless of its economic outcome is to propose a brand identity by design and the other, internalizing best solutions to the defined strategies is to improve market opportunities. The former represents a DDI approach by its nature framing a competition to get the most innovative product concepts and designers. The latter would be determined as the supplier for market and user research and also a ground for further next generation product concepts to be developed by means of the knowledge it provides.

For being a design driver, communication skills and network management are important in Nurus. In fact, they try to get information about design discourse from various sources like personal relations. Acar (2015) states that they have projects which are started with a conversation: "My friend said that Ito Design has a product idea that fits to Nurus and we have got the design". However, it does not compile a systematically organized research distributed across those external actors. Instead, after having the design brief specified, they search for the actors or products that would fit to the design brief or the company's vision. Design approach of Nurus regarding their research agenda is summarized in Table 3.7.

Table 3.7. Strategic approach of Nurus to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Designer research	Designer research, Designer portfolio management	Catching best actors	Knowledge about various visions
Customer needs	Market research	Competitive advantage	Cost reduction, Functional improvements
Competitors' products			
Trend research	Design research	Trend forecasting	Product design strategies
Concept research		Catching best concept ideas	Chance to create new visions
Aesthetic value		Brand identity creation and development	Value creation and extension
Testing	Technological Research	Getting certificates,	Being qualified, Brand value
Reduction of material use		Competitive advantage	Cost reduction
Production quality			Brand identity
Ergonomics		Customer needs satisfaction	Technical improvement
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Product group specifications
Product segmentation		Design brief determination	

Design Brief Specification:

Marketing department is responsible for design briefs and giving hints about it by providing a *well-justified concept*. Nurus Design Lab researches for related domains that defined concept covers. The designers present their initial insights about the concept to the internal managers to further develop the trend concept. After selecting the external designer, the process continues within a collaboration in which there is an information flow between the designers and other interpreters like engineers, suppliers, test laboratories and Nurus. The brief and trend concept are improved by the interpretation of those actors and yet finalized with a new product through following a process possible applied by other many furniture companies. However, Nurus mostly prefers to get *nearly finished* product concepts rather than determining a design brief since it takes so long time and sometimes ends with a failure of collaboration with designers for that concept (Acar, 2015).

Designer Selection:

Nurus collaborates with 30 external designers whom are selected through their recent works and experience of the specified task. Furthermore, the fame and project outputs of the designer(s) drives Nurus to select the *right* designer accordingly. Personal

conversations and market research in terms of external actors are the source of this research for Nurus.

The Product Case: Pitstop and Lodge

Through the products of Nurus, a meeting table, Pitstop, (see Figure 3.6.3) by Ece Yalım Design Studio is selected as a product case since there are no other such products with an adjustable table height in 2012 Orgatec Furniture Fair (Acar, 2015).
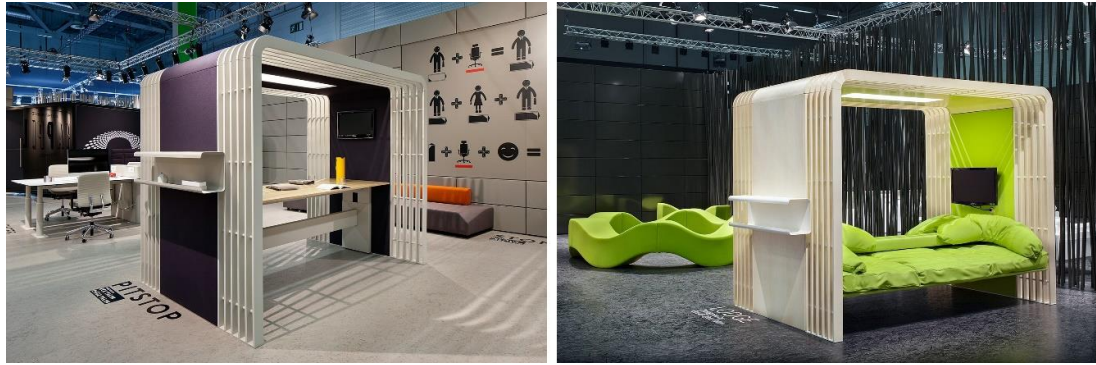
Figure 3.6.3. Pitstop and Dodge, meeting table and seating furniture by Nurus
(Source: Nurus Furniture, 2015d)

Ece Yalım and Oğuz Yalım having the idea of a product for casual meeting concept introduces Pitstop concept with some sketches to Nurus. After an interpretation of Nurus managers and determining a brif according to casual meeting concept, they further work on the idea to realize it in three dimensions by visualizing in a modelling software regarding defined outline. Being followed by the presentations and further improvements on Pitstop as to be standardized for mass production with proper methods, four prototypes are produced for the product. The process is finalized with adding technological supplements to the product such as electrical fitments, height adjustment function with a motorized mechanism and compatibility function allowing additional standardized products like led monitors to be attached on. Dodge is an improvement on Pitstop to create a resting and seating area in the office.

Listening:

The exploration of the concept generation phase in Nurus comprises of two individual interviews with Ece Yalım and Oğuz Yalım. However, the interview data analyzed and presented together within the idea that they cover and validate each other while introducing different perspectives on the same questions.

The source of design in Ece Yalım Design Studio (EYDS) depends on the daily life experiences of the designers. O. Yalim (2015) defines his design perspective in

terms of observations; constructing analogical relations between objects, activities and situations; and reading much. E. Yalim (2015) underlines that her sources of design ideas differs in terms of their mediums such as journals, art exhibitions, fairs, magazines, editorial movies, internet search on design trends and so on.

The sources mentioned above may be defined by other designers in the same sense that they create an experience and knowledge about design, future trends, market situations, fashion, life styles but the design discourse. However, EYDS senses those sources by the idea of synthesizing them in terms of furniture languages and structures especially within the conceptual interior environments they created for each product. E. Yalim (2015) states that they always think of the office environment and research for interior activities. O. Yalim (2015) underlines that they have an interior architecture knowledge due to their initial projects that are issued to interior architecture. He (O. Yalim, 2015) emphasizes that he is an interior architect with a 10 years of knowledge which helps them for detecting interior working activities and their failures. Thus, this knowledge may be stated as an advantage of EYDS since it proposes an ability of interpreting various sectoral knowledge like regenerating interior architect experiences for design discourse. At that point, O. Yalim (2015) states: "we want to be get involved in different projects for various sectors and make analogical connections between sectoral data, so that we may convert some findings of a sector as inputs for another." In fact the interior architecture knowledge proposes EYDS an approach regarding activity research. Through this knowledge, they may research for and interpret activities held by end-users. This approach reveals a multifaceted focus regarding both end-user and customer needs together to define new product visions about future contexts. Hence, a radical output would be created through if the life contexts and related meanings are interpreted in a well-defined future forecast because activity research comprises of a context of life. It also defines a *meaningful* environment that creates a subculture and cultural studies refer to a DDI approach even as here, it would be carried out designers rather than a research team consisting of sociologists and other critical actors. As well, EYDS searches for those research data by reading *too much* about future trends and activities implemented in office environments.

Furthermore, this approach is preferred to better clarify the design concept since EYDS defines its own design briefs. Working on a specified external brief is much more limited to address a concept than defining a life context around a product and in its environment (O. Yalim, 2015). Hence, EYDS tries to develop life contexts by products

within a designed conceptual environment to better justify and test the concept via virtual visualization tools like 3D programming software. They use this method as communication strategy as well in all their projects.

Interpreting:

The interpretation process starts with *text* and writing on a paper (O. Yalim, 2015). The ideas are generated and grouped together under related product concepts. Here, the main important criteria is grounding the concept in a well-defined *story*. Hence E. Yalim (2015) states that their concepts have to have a contextual story to tell by being supported by additional related concepts. Their interior architecture knowledge is one of the drivers to generate initial ideas regarding the office environment that provides not only a perspective in which they may easily get problematic areas, but also a conceptual environment where office activities would be observed.

Various aspects of design concepts are evaluated through their functionalities, novelty degrees, stories, material selections in respect to the companies' design briefs and abilities to carry on the project. They often grade the concepts according to those criterions and interpret them to better satisfy the desired proposal.

The interpretation process is characterized by to which company the product will be designed. EYDS tries to balance their findings and the collaborator company's vision and abilities in their products. For instance, they develop more than one product concept in different hierarchical meanings; two concepts for mid-class income user group and one concept for a higher one. Once the *proper* concept among others is selected by the furniture company, they deeply focus on that concept for further developments. Hence, by interpreting for different concepts and segments provides a ground to their design philoshy in which they communicate with design discourse within a wider approach. Moreover, this enhances the communication between EYDS and the collaborator firm by sharing additional knowledge and suggestions regarding concept variety.

Addressing:

EYDS addresses its design concepts with 3D renderings to the interpreters. In their presentations, they introduce the product concept first and then comes the environmental applications and a user scenario. Both E. Yalim (2015) and O. Yalim (2015) states that they want their concepts to be produced so that they present them with the relations between the product and user in specially designed office environments.

3.6.1.2. Operational Dimension

In a sense, Nurus operates the process with the same NPD procedures such as planning the process by means of strategic decisions on new product concepts, generating the concept to be produced in stream line, improvements for lowering the costs, constructing prototypes and testing them, product language design within the detail fittings and yet communication design like many other furniture manufacturers. However, Nurus differentiates itself by regarding *extra* attention on production quality and detail fittings; hence, it uses its *qualified* production system as means of product language and brand value (Acar, 2015). Even though the developers of Nurus try to lower the costs, it does not have a dramatic effect on product languages yet they pay attention to *Nurus quality*. In fact, it is about solving the detail solutions on the product concepts in a cheaper way by design (e.g. choosing the best cheaper supplements) or technical abilities to *quickly* see the results on prototypes.

In fact, Nurus divides initial products into separate parts and work on each one individually. Those parts are analyzed according to their production requirements and diffused to several external actors if they would not carry on the process internally. All those parts are produced separately at a time period that is defined before and assembled together in the factory. The interpreters including internal, marketing, design, planning, sales and purchases executives but the external designers (e.g. from Italy), production experts (e. g. from Germany) and prototypes (e. g. from China) discuss about the prototypes. Therefore Nurus has a role of a process organizer who has the ability to develop product concept with CAD tools and an emerging production line.

The communication between those actors is crucial for NPD process since the concept has to be well-defined and addressed to each of them. Thus, Nurus tries to develop communication levels through determining the concept in progress at the top point which frames a knowledge and information flow between actors. O. Yalim (2015) states that: "if there are frictions on the way of presentation of our concepts to the firm and the concept could not introduced perfectly, there would be some design failures at the end." His insights to the communication design in terms of product's own language and conversations between actors would be seen as *conversational activities* in Nurus those which contribute to the communication design. In fact, in each step of the process, communication design of the outcome is a bit shaped until its market entrance; and

further developed focusing on deepening its connotations with additional advertisements by various channels. Showroom exhibitions, publishing magazines and brochures, workshops regardless of its content and also the fairs are the channels in which the new product concepts are introduced to the design discourse.

Besides that communication platforms, Nurus pays an extra attention to design awards. Because they orient their products to an internationally well-known, standardized stage regarding products' design, production technique, materials adopted and sustainability. Through design awards, Nurus presents a success of design and communicates with it. Moreover, developing designer portfolio is one of the strategies Nurus adopted to create a brand image by means of its collaboration abilities with international well-known designers in furniture industry like Arik Levy (Acar, 2015). Nurus uses their fame and experience as a tool for communicating with market. In fact, Nurus is involved in various workshops about different disciplines to introduce its products under the theme of, for instance, "a designer Arik Levy will talk about his new design" (Acar, 2015). All those and additional product based information and yet other design related articles are shared on Nurus website to enhance communication.

3.6.1.3. Market Entry Phase

Market-entry channels may be similar with many other furniture companies by covering magazines, brochures, and multimedia advertisements. Attending workshops for presentation of the products, furniture fairs and launching cocktails in showrooms are other platforms that Nurus enters new concepts to the design discourse.

3.6.1.4. Organization of Innovation

In a sense, Nurus has a role of an organizer in NPD process. A systematic approach is internalized that frames the entire process by defining, for instance, to whom the design brief will be introduced and with whom to be collaborated within the process in terms of getting support about technical issues those which would not be covered internally such as prototyping of specific parts, ergonomic analysis, durability and material tests and environmental tests. Moreover, external actors like intellectual

property rights consulting companies and public relations agencies have effects on the process in different dimensions.

Both formal and informal meetings are arranged within the process. Acar (2015) states that they both have advantages according to the situation and project. For instance, a formal conversation between a worker and designer would be profitable to discuss on the methods to be used; but in another sense, it would be hard to speak with him formally, instead, an informal data would be better to imply the desired outcome (Acar, 2015).

The design manager has a role of brokering of the languages between departments and external actors. Actually they are the managers of entire design process. One crucial strategy Nurus adopts is that purchases department gets involved to the idea generation phases as to interpret the current situation in terms of material and application costs and trends.

3.6.2. Ersa

3.6.2.1. Strategic Dimension

Innovation Approach:

Ersa perceives innovation as a *system* in which various factors like *customer needs, competitors' products* and *sales plans* are taken into consideration. Customer needs - so do the "sales channels" - are segmented through their profiles such as banks, hotels and offices. Banks and hotels constitute an operational segment in Ersa's assembly line in which Ersa has a role of a producer; however, offices form a *strategic approach* where Ersa focuses on design in terms of customer needs consisting of *product dimensions, reduced costs, technological advantage* and *functional benefit* and so on. Ersa tries to get advance by reducing costs and *easing transportation* in their *"operational office systems"* which consists of managerial (not the executive) products. Competitors' products are seen as *inputs* of this strategy as they refer to product cost and functionality determiners. Sales plans of Ersa are the other inputs of innovation approach by which the future is planned thoroughly. All those criteria and input data are focused innovation as a system in which *layout design* of the products in the application area (offices, hotels, banks etc.) is seen as the major determiner. Hence, Ersa provides a

service to its customers for layout design in collaboration with an external consulting company. The main objective here is to create a working space that is *efficient* enough to get *maximum performance*.

Technological innovations have not a dramatic effect on Ersa's innovation strategy since material and production technologies in furniture industry are not discontinuously changing. Yalçın Ata (2015), product manager of Ersa states:

> "In the furniture industry, there is not too many material innovations. For instance, there is no such thing that we do the painting or coating of the furniture in this way; all the materials you used are yet the same furnishing materials. So that, here, we focus on how we reduce material costs or how we easily transport the products. In addition, how we provide a space in which people should work more efficiently." (Ata, 2015)

The source of product innovation in Ersa changes through the product segmentation yet it is structured as the main indicator of product design decisions. End-products would be grouped under three categories; the first represents the semiotics of the products as executive furniture, the second groups products under office systems in which there are workstations and integrated accessories and the last consist of products like chairs, waiting units, office task chairs, conference hall chairs, accessories and metal storages (Ersa Furniture, 2015c).All those product groups have various products that are designed to be differentiated by meaning especially in executive and managerial groups and sometimes in others to accelerate the sales of standardized, well-known Ersa products like metal storages, workstations. Wall which changes the meanings of metal storages from being a "storage unit" to a "dividing and space organizer panel" is that Yalçın Ata gave as an example (see Figure 3.6.4). Hence design ability is leveraged for meaning changes as a strategic approach in various group of products whose prices are mostly defined by Ersa because they are new to the entire world. Moreover, Ersa tries to be differentiated by cost reduction on its previous products through market research. Meanwhile, market research is the source of incremental innovations in Ersa.

Figure 3.6.4. Wall, metal storage by Ersa. It changes the existing meanings of metal storage units.(Source: Ersa Furniture, 2015c)

Table 3.8. Strategic approach of Ersa to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Customer needs	Market Research	Competitive advantage	Cost reduction, Functional improvements
Competitors' products			
Layout design (variety)	Design Research	Brand identity creation and development	Value creation and extension
Aesthetic value			
Packaging		Easy transportation	Modular design, System design
Reduction of material use	Technological Research	Competitive advantage	Cost reduction
Ease of transport		Modular design	
Ergonomics		Technical improvement	Customer needs satisfaction
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Product group specifications
Product segmentation		Design brief determination	
Workspace efficiency		System design	Value extension

Strategic approaches in Table 3.7 define Ersa's future products in terms of in which segment the new product will be introduced. Design briefs are determined through product segmentations and sales/planning strategies of Ersa. Workspace efficiency is another strategic approach that lead to a system design in which, not only the products are designed but also the working environments are taken into

consideration to improve the efficiency. Other categories specify criteria for design brief in terms of various objectives affecting end-products regarding cost reduction, functional improvements and value creation and extensions.

Ersa decides on not only which product will be *developed* (re-designed) but also for which segment a new product will be *designed* according to the sales reports of each product segment which is analyzed through sales and planning strategies as shown in Figure 3.6.5.
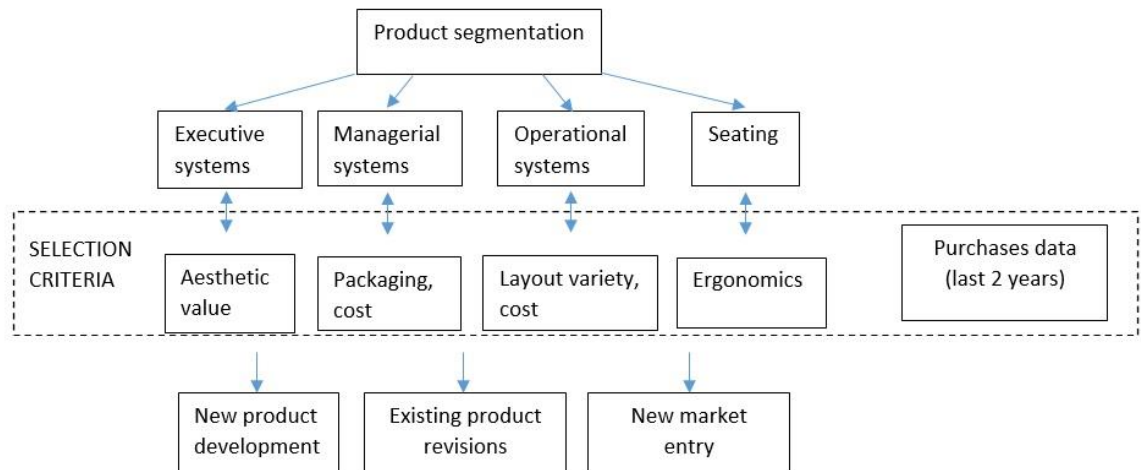
Figure 3.6.5. Ersa's decision scheme for future products

If a market pressure is seen on a product segment, it would be reinforced by two choices of product design approach. *New product developments* are mostly occurred in executive systems in which aesthetic value has a dramatic effect for value creation and extension since it represents the brand identity, ability and vision. Hence DDI approaches are seen mostly in this domain as it refers to meaning changes in new product establishments. *Existing product revisions* are for the improvements of existing product portfolio and mostly regarded with the segments other than executive systems. Incremental innovations among others are seen mostly on those product groups to get advance in competition. However, it does not mean that new products are developed in a radical design approach in only executive products segment.

Design Brief Specification:

Design briefs are specified by an internal organization in which technological, design and market research data are gathered by various departments and discussed in formal Figure 3.6.6). According to the decision scheme above, they are analyzed, related and oriented to the specified product segments.
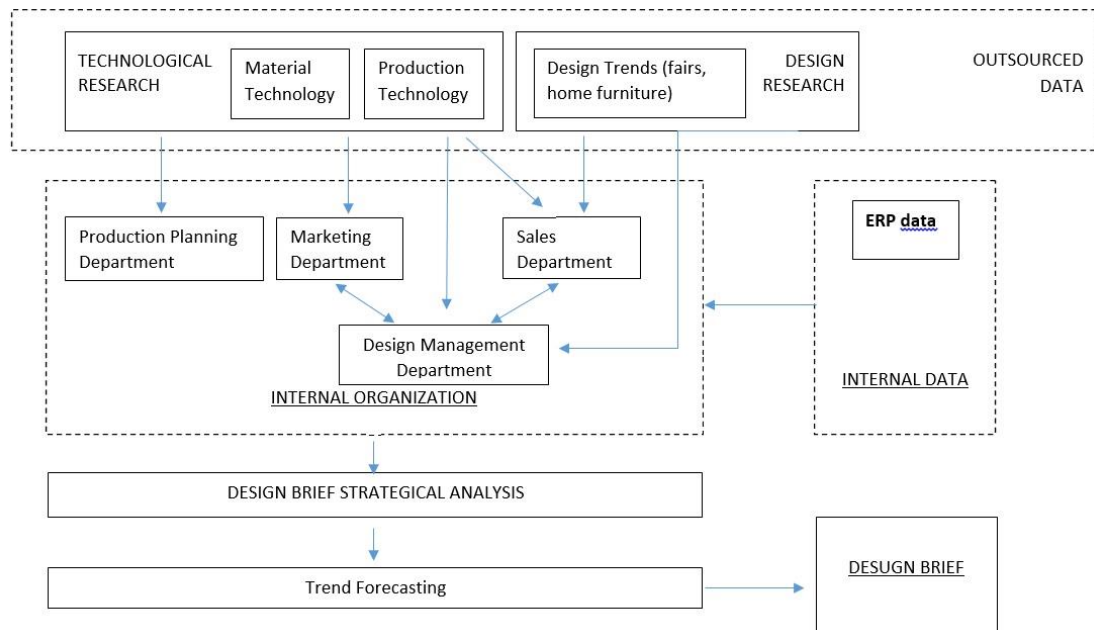
Figure 3.6.6. Design Brief Statement Scheme of Ersa

ERP (Enterprise Resource Planning) data represents the company's existing internal sources containing the corporate human resources, production, sales, customer relationship management (CRM) information. The internal organization analyzes research data within the reference that ERP provided to propose a literal design brief which would be synthesized with Ersa's existing abilities and future plans. Besides those analysis, trend forecasting data shapes the semi-structured design brief so as to focus on future trends for a long term advance in competition.

Designer Selection:

The design brief gives hint for Ersa with whom to be collaborated with for the design problem. If design brief covers an improvement on an existing product, the company focuses on internal designers even the product is designed by external consultancies but having permission to improve the design depending on their agreements. On the other hand, if design brief is about to design an entirely new product for mostly executive (and managerial) product segment, Ersa collaborates with external designers who have experiences and fame on the area that design brief determines. However, the most important criteria for designer selection is the *coherence* between the company and the designer yet Yalçın Ata says:

"The designer has to understand us very well. S/he has to understand our capacity, our ability and then, interpret her/his ideas dependently… The designer has to synthesize her/his perception with the company's approach... Actually, sometimes we have problems with designers since they do not understand our design brief. We want an economic product but s/he comes with a niche-market product; so that not only the brief but also the agreement is wasted... But when you say that we want 3 different dimensions, 3 different materials and colors and if they produce the concepts accordingly, we may carry on the project." (Ata, 2015)

The Product Case 1: Frame

Frame is designed by Ece Yalım Design Studio whose approach to design is briefly given in Nurus section of this chapter. Here we focus on their executive office working system design called Frame (see Figure 3.6.7) as a case for Ersa. It is selected as it might give clues about the approaches of designers to design an executive product.

Figure 3.6.7. Frame, executive office furniture set
(Source: Ersa Furniture, 2015b)

Ece Yalım Design Studio (EYDS) argues that managers like to show off their choices of products and accessories they use to emphasize a vision (E. Yalim, 2015). This claim drives the ideas about "providing an exhibition area for managers rather than exhibiting the object (the product) as the matter of subject". This concept brings the ideas together in an outline in which a lightweight design structure rather than a bold, heavy one is interpreted thoroughly. Hence, Frame is structured by 2 cm x 2 cm profiles. It makes sense as it is the one example specified as an executive managerial set design in Turkey which is structured with lightweight materials and presenting the user himself/herself instead of itself. The cultural coding about heaviness and management is tried to be changed with this example.

Furthermore, the product concept bring modularity to the managerial office set designs. Especially in Turkey, there is a tendency to emphasize the power of management with dark, heavy and sumptuous furnishings (E. Yalim, 2015). However, Frame provides an area for user experience and customization with modular separate parts and color and finishing alternatives.

In Frame's NPD process, Ersa overcomes the prototyping problems by collaborating with external producers in Germany (Ata, 2015). O. Yalim (2015) underlines that: "if the product has a strong meaning behind it and the company believes on it, with further efforts to realize the product, it has no chance other than being a successful product".

The Product Case 2: Geo

Geo (see Figure 3.6.8) from the accessories group is specified for the product case. A semi-structured interview is conducted with its designer Şule Koç and the owner of Şule Koç Design which is established in 2010.

Figure 3.6.8. Geo, divider panel by Ersa
(Source: Ersa Furniture, 2015c)

Geo is designed without a specific design brief. The main objective of the project is to design a supplementary furniture. Koç (2015) states that: "the process was difficult to carry on because we have not determined a specific design brief" regarding the brief as one of the drivers for design.

She develops initial ideas around the concept of dividing the office interiors in terms of specific activities rather than focusing on to create separated areas for private working. Instead, she wants to spot areas with a dividing panel. The main criteria for

this panel is "being lightweight" since current offices are small in space (Koç, 2015). Through this way, the users would easily adopt the product to different office layouts. Furthermore, its language is designed within the idea of emphasizing not only the product itself in its environment, but also the area specified by it. Hence, she decides on a rectangular shape to contrast her product from other furnishings that have mostly corners and create spot points in the office. For the communication of the product, she proposes a co-design approach by giving ability to the users to create various shapes on rubber strings.

Listening:

Koç (2015) approaches innovation as it is not only a product based phenomenon but also it has to be thought in terms of the spaces used in and activities held by the products especially in office furniture design. She (Koç, 2015) underlines that office furniture design comprises of and defined by activities in a specified small area so that she looks for how future activities in an office would be emerged. Here, the feedback provided by the collaborator firms (Ersa) is the main source of design since they have executive knowledge about not only the material and production technologies in their market, but also the user trends with their market research analysis. Furthermore, consultancies with external producers, management agencies and suppliers of the collaborator firm are the other sources of ideas for Şule Koç; hence, she takes their data about customer profiles, current activities in the offices, new products added to the office life, the organizations of office spaces and so on as inputs to her listening phase.

She (Koç, 2015) defines those inputs as a strategic approach in which the process from idea generation to the market-entry phase must be planned thoroughly. Because, a strategic plan is needed to realize product concepts with a planned knowledge transfer between the actors involved in the process which feeds her with several data inputs about architectural environments, working habits in an office and accordingly the ergonomics to get a better performance from the products (Koç, 2015). The knowledge transfer here contributes to the designer's perspective and experience of design when collaborated with different companies from various sectors.

Besides the sources stated above, Koç (2015) is fed by other sources of information through design and business blogs and email groups, fairs, conferences, exhibitions, arts, fashion, technological magazines and so on as many designers. She collects those information and notes as texts and drawings.

Interpreting:

Koç (2015) defines the main determiner for the interpreting phase as design brief when collaborating with a furniture company. Design brief helps her to collect required information about desired product, group them in specified concepts and narrow down her current ideas about the project. She criticizes the ideas that are written and drawn on roll-up papers for generating a mind map through design brief and data gathered from collaborator firm and its consultant firms to better create a proposal. The analysis and selection of the ideas are shaped regarding design brief and the collaborator firm's abilities to carry on the project with proposed design concepts.

She tries to synthesize her ideas with the company's vision by creating new meanings that would fit design brief regarding the *interpreters'* feedbacks on market demands, material technologies and recent working environment trends and so on. Those feedbacks not only give her evidences from the culture to which the concept will be introduced, but also provides an outline that have various restrictions and opportunities introduced by various actors (interpreters). Furthermore, these feedbacks are more realized in operational dimension of the entire process to create a product language and to develop communication strategies and tools for market-entry phase.

Koç (2015) states that "we have codes in our lives and we have to forget about them when designing". Instead, she (Koç, 2015) underlines that she tries to recode her knowledge of design as product languages without considering any textual or visual codes. Hence, she considers those impacts in her interpreting phase when selecting and generating ideas accordingly. Mind maps and simple mock-ups are the tools for Şule Koç Design in this phase.

Addressing:

The selected design concepts (proposals) are regenerated for introducing to the other actors (interpreters) with a narrative approach to design a launch scenario in which the process from initial ideas to generated concepts is defined; but especially the concept of design. Product renders with color alternatives are represented to the actors for whom she would select and further develop the concepts in collaboration with.

3.6.2.2. Operational Dimension

Operational dimension of Ersa comprises of new product development activities like prototyping, defining the production techniques, selecting the material that will shape the end-products, language design of the product and communication design like other many furniture companies. May be one aspect differentiates Ersa to be one of the leaders in office furniture industry in Turkey is that they try to improve their production opportunities via consulting with international agencies. Meanwhile, they develop prototypes with external partners if they cannot held on the process to test if it is suitable for their strategic plans. Through this way, they have the opportunity to see the best methods and tools for production from experts of specific area, so that they improve their production facilities accordingly.

Materials are defined for the selected concepts in this phase to determine the products' market segment since they represent the products' costs and prices; but the language design. Product language design activities are held by different actors such as technicians, engineers, designers, production and marketing experts, and various inputs about how; the concept would be produced as efficient enough to get turnover, how mechanisms would be developed with the interpretations of (external) engineers and how the products would overcome ergonomic and sustainability failures. For those inputs Ersa collaborates with external engineers and testing laboratories. Ersa gets certifications about ecologic sustainability and production standards so that develops a product language taking account of them by integrating the product meanings with those standards. Meanwhile, their production standards and concerns about ecology are tried to be embedded in the product language. A collaborative organization decides on those criterion to create an *Ersa product* language, thus, internal designers work on further improvements of the concepts regarding technical adaptation process in terms of manufacturing abilities of Ersa, ergonomics, Ersa's standardized dimensions, the transportation; in short, the corporate culture of Ersa. All their interpretations on the product concept affect the operational level activities until the management team decides on to launch the product.

In addition to those interpretations, Ersa follows strategic paths to communicate with its customers and interpreters of design discourse. For the target group, Ersa establishes magazines and brochures introducing the new concepts. Which

combinations will be used with that product and how they will be arranged in what kind of environment are the main aspects of product level communication design. However, Ersa tries to communicate with its target customer group via publishing a monthly design, art and idea magazine called Box in a Box Idea which is honored by If Communication Design Award and additional three international ones (Ata, 2015). It is delivered to various group of people containing students, academicians, artists, customers and so on. Furthermore, articles about furniture design trends, recent applications and layout designs are provided in Ersa's website to better communicate with the customers and design discourse by involving them into the scope they work on. In addition, attending to workshops about various subjects as a presenter is another communication tool that Ersa uses.
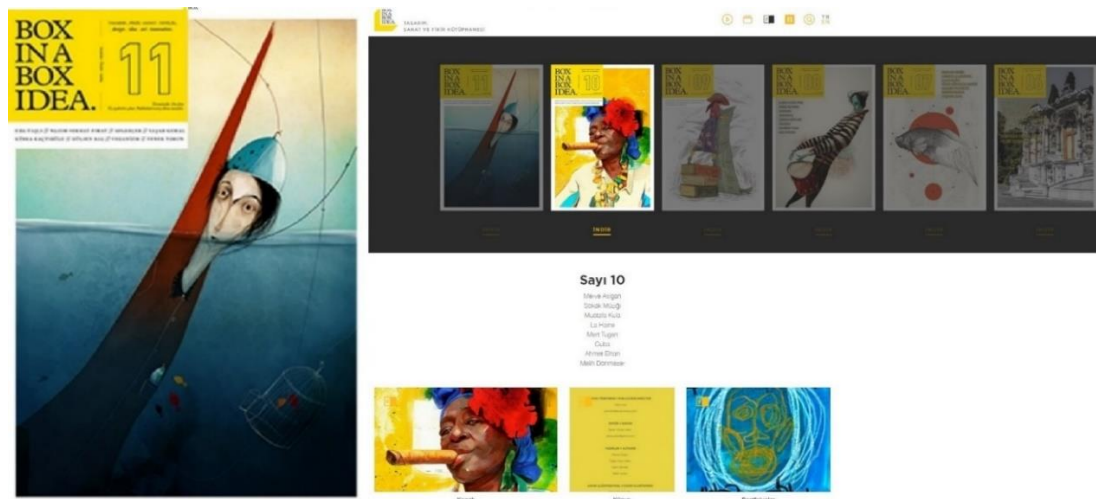
Figure 3.6.9. Box in a Box Idea Magazine and Blog
(Source: Ersa Furniture, 2015a)

Ersa defines an award strategy in which it tries to be labeled with well-known international design awards such as If, Red Dot, Good Design, International Design Excellence, German Design, and A' Design; and national competitions like Design Turkey (Ersa Furniture, 2015a). Furthermore, Ersa collaborates with external national and international designers not only to enhance its product portfolio but also to advertise its abilities on managing an international process. Through these ways, Ersa communicates with design discourse and customers in a way emphasizing brand approach to design and also the brand value.

3.6.2.3. Market Entry Phase

Ersa launches its products by organizing activities in its showrooms besides establishing product brochures. Furthermore, the workshops and fairs are the other tools that Ersa adopted into its products' market-entry phase. Sales and marketing executives are responsible for the introduction of end-products to the customers and design discourse while they are supported by various advertisement channels like design magazines.

3.6.2.4. Organization of Innovation

The entire process is defined by an internal organization consisting of sales and planning, product management, and marketing and production departments. Critical strategic decisions are discussed within formal meetings. Besides the knowledge transfer in these organizations, through informal conversations between departments contribute to the internal communication.

External actors have close relations with the departments which they are sharing specific information about their expertise. However, product manager has a role of brokering the languages between all the interpreters of the process since Yalçın Ata and Zeynep Seskir are responsible for the management of the process within its internal and external organizations.

The external actors are specified within those organizations according to the projects' requirements. For the designer selection, well-known and experienced designers are searched for specific tasks of the design brief. For instance, Şule Koç is determined to collaborate with to design a supplementary unit for dividing the office environments since she would come up with ideas reflecting an artistic style.

3.6.3. Tuna Ofis

3.6.3.1. Strategic Dimension

Innovation Approach:

Improvements on product functionalities like ease of application, transportation, reaching raw materials and productivity are defined criterions on Tuna's design and innovation approach (Tığlıoğlu, 2015b). In addition, Tuna aims to create products that would be applicable in various projects regarding layout variations especially in operational group segment. They frame the whole process balancing the NPD practices to standardize the product family in terms of production. It provides a systematic approach to the sales and after-sales service management since it proposes all the process structure. Hence, innovation in Tuna is objected to be improved via a systematic approach regarding not only product design, but also a service design in which Tuna tries to create a "solution collaboration" with its customers (Tığlıoğlu, 2015b). All the product design decisions are framed under those critical aspects in Tuna.

Market research is carried out by Tuna to forecast the future and accordingly define a strategic approach to get advance in competition. Tığlıoğlu (2015b) states: "We aim to provide products new to the market by researching for existing market conditions". This approach is similar to the all cases in this thesis but market research is framed within those aspects defined above in Tuna. Fairs and exhibitions even they are not directly related to furniture industry are the main resources for market trend research and analysis in Tuna. The fairs and other industry based activities are planned annually in terms of who would attend to which activity, and a budget is defined through the strategic approach of the current year.

Competitor analysis is another driver for market research considering the competitors' product ranges and product prices. Product segmentation here defines the research area to better analyze strength, weaknesses, opportunities and threads (SWOT) data since Tuna focuses on product families regarding its segment and analyzes competitors accordingly. This approach reveals a product based approach to the market research which would be the source of trend forecasting in Tuna.

Design research in Tuna comprises of researching for new characteristics in design regarding a new meaning and product language. In fact, this research is

conducted to be get in touch with external actors especially designers who has known with her/his vision to create innovative products. Tığlıoğlu (2015b) approaches to design research as "it opens up a new way to our aims" because design is the scope of all research in Tuna to overcome the probable problems of competition.

Furthermore, taking a rapid reaction to those pushes from competitors defines another criteria for design research. In fact, Tuna tries to be differentiated with its speed to get stance to a negative evidence. This approach affects the product design procedures in terms of raw materials and production techniques settlements. In other words, it enforces Tuna to focus on the production and application *speed* of its products. This perspective reveals a systematic approach in which the workflow schedules regarding time and all the process data are stored in a sequentially updated database. Design research activities are defined in terms of their scopes and time throughout this database. In addition, design approach of Tuna is affected by this speed domain since they try to reach a product range that is mostly characterized with products having a simple production technique. The main objective of this approach is to lower the costs, speed up the process and easily access to the raw materials. Therefore, main design research databases of Tuna is criticized through those main factors (*see* Table 3.9).

Table 3.9. Strategic approach of Tuna Ofis to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Customer needs	Market Research	Competitive advantage	Cost reduction, Functional improvements
Competitors' products			
Layout design (variety)	Design Research	Brand identity creation and development	Value creation and extension
Product characteristics			
Easy application		Easy transportation	Modular design, System design
Reduction of material use	Technological Research	Competitive advantage	Cost reduction
Ease of transport		Modular design	
Product standardization		Technical improvement	Service design, Cost reduction
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Product group specifications
Product segmentation		Design brief determination	

Design Brief Specification:

Design briefs are defined throughout an editorial line in which there are some procedures under several group of practices. The first consists of a market research analysis to get insights to the internal and external gaps. The main criteria before design brief statement is that the product concept has to have a meaningful income ratio. The main objective here is to get advance of the product sales within a growing ratio so that Tuna focuses on the costs in initial sections. Therefore the costs of developments for the defined product segment are analyzed first to determine a general proposition for the brief. Besides that, according to the product segments that would be filled with new products, meetings are arranged to decide on whether the company will collaborate with external designers or introduce the brief to the internal ones. Mostly at the fourth meeting, design briefs are determined. A consultant company with whom Tuna collaborates in terms of getting a market and design research agenda is introduced to the design brief specification process. In that phase, the consultant firm is asked to interpret brief outcomes and market conditions to propose a better well defined brief.

Designer Selection:

According to the brief's expected results, Tuna collaborates with external designers since they try to improve their design portfolio by adding one or two designers annually. Tuna tries to be collaborated with famous international and national designers regarding their product ranges. Moreover, by working with famous designers, Tuna aims to get an advertisement chance of being named with those expert designers. The main approach is here to analyze if the designer have attractive products to the defined strategies and briefs. Fairs and other consultant companies' contacts are searched for reaching the *right* designer(s). For instance Tığlıoğlu (2015b) states:

> "We have found a designer in Orgatec Furniture Fair whose products attracted us so we further analyzed his design portfolio. After a research, we have noticed that he has collaborated with our partner Girsberger, a Swiss furniture manufacturer, several years ago. Then we assigned a contract with him."

Having close relations with other manufacturers and suppliers enhances the chance to reach to the *right* designers. Those designers who has a background information consisting even a few project experiences are mostly interested by Tuna. Hence, Tuna tries to embed external experiences regarding different approaches to the design problems to its corporate culture.

The Product Case: E-Motion

E-motion (*see* Figure 3.6.10) is selected by its coverage of strategies and approaches regarding the entire process as the product case. Because it proposes a simple production process through which standardized raw materials like structure steel tubes would be interpreted in a different way internally. As well, reforming an easily accessible material like that objects Tuna to have advantage of speed in the market. Moreover, ability to carry on the process internally is another advantage of E-Motion in terms of production costs and planning.

Figure 3.6.10. E-Motion by Tuna Office
(Source: Tuna Office, 2015)

The interview for E-Motion is carried out with its designer Ozan Sinan Tığlıoğlu. His approaches to design and the idea generation processes are analyzed in general via framing the questions by E-Motion.

Figure 3.6.11. E-Motion workstation
(Source: Tuna Office, 2015)

Listening:

In the listening phase external actors like close friends to whom Tığlıoğlu (2015a) asks about their ideas on future trends; material suppliers those which introduce new materials and material technologies; Tuna's consultant companies who give feedbacks about his ideas and recent trend research outcomes. In fact, Tığlıoğlu (2015a) have a role of language broker between those and internal actors who have the knowledge about production and material technologies. Furthermore, Tuna collaborates with several universities to carry out student projects. Moreover, he attends many workshops as a speaker or lecturer. Besides, sponsorships that Tuna undertakes are the other sources of networks for Tığlıoğlu. Hence, all those actors provide a network based research agenda to Tığlıoğlu.

Design research is conducted by Tığlıoğlu (2015a) via observation. He takes notes of every special thing that he is attracted by, even some photographs are collected and stored. This archive drives innovation for Tığlıoğlu since he always turns back to the older notes. E-Motion, for instance, "is a product that has its roots from 7 years before. I tried to reflect the natural disruption through the corruption of non-natural material. But the idea was in my mind seven years before" (Tığlıoğlu, 2015a). Thereby, design research for him comprises of both imaginary and visual database which is checked in time spontaneously to get new ideas. Moreover, trends in textile and advertising and also automotive industries are particularly followed by Tığlıoğlu.

Market research is held by visiting fairs, discussing with the consultant company about market trends, arranging internal meetings regarding SWOT analysis and trend

forecasting data and communicating with sales and marketing departments in most of the NPD process. Those channels provide a networked knowledge source for Tığlıoğlu to interpret in a new product idea.

Technological research agenda, again contains the fairs. Especially, Tığlıoğlu (2015a) attends fairs regarding production tools industry, automotive industry, material technology, customer electronics sector and so on. Observation and archiving the brochures or photographs with contact information serve a technological data input to Tığlıoğlu.

Interpreting:

The interpreting phase starts with sketching as most of the cases in this thesis. Tığlıoğlu (2015a) mostly focuses on the idea behind the product since he underlines that:

"If the product has a story behind it and if it is strong, and when the better we translate it to the sales and marketing departments and also to the external advertising and PR agencies the most the concept would be successful".

The initial ideas are interpreted through the criterions as regards to production abilities of Tuna. Meanwhile, Tığlıoğlu (2015a) tries to get a balance between his insights and the company's production line by defining the cost at the initial idea generation phases. In fact, Tuna predicts about the new product costs, then starts to discuss about possible design briefs.

Material accessibility and production simplicity are other concerns that Tığlıoğlu takes into consideration while interpreting his initial ideas. Hence, he tries to get advance of being rapid in material access and yet producing with basic production techniques internally. Knowledge about Tuna's abilities frames this section.

Addressing:

Product languages and communication design are defined within the idea generation phase. The main criterion here is the product segmentation since Tuna proposes its briefs according to the SWOT analysis of each segment. Through the analysis, the product costs; so does the product language design are framed. The materials, colors, detail improvements are revealed with this approach.

The communication of those products are held by sales executives and dealers. Thus, it is important to translate the language and concept to those actors. Tığlıoğlu, represents even his sketches to the other interpreters as to establish a transparent improvement process. He tries to explain the concept and idea through 3D renderings

for the first stages. It is followed by technical detail improvements and virtually realizations of them in CAD software. Through this way, Tığlıoğlu (2015a) states that "the communication is better in this way. Because sometimes people do not look like you but when you show something visual, it would help them to get the idea behind."

3.6.3.2. Operational Dimension

The practices in operational dimension is outlined by a systematic approach managed with a software specially developed for Tuna. The software collects the process inputs and outputs in Planning Department which is responsible for the entire process.

The process starts with meetings to define the strategies and budget and yet the design focus. After having design brief and designers defined, operational processes starts with prototyping phase. This phase is carried by 2 workers and a foreman working in prototyping laboratory since Tuna has a small production line for developing prototypes.

The first prototypes are for realizing the product concept while the second ones represent the product's expected materials and production techniques similar to the other cases of this thesis.

Technological research is conducted to improve the concept's materials and details. This material research aims to get efficient solution in terms of standardization of production. Meanwhile, Tuna tries to use easily accessible raw materials so that improves their product concepts regarding its compliance with simple production techniques. Hence, material research reveals some experimental development activities like reforming the shapes of well-known materials. In addition, those materials are defined through their testing standards.

Accordingly, Tuna provides a quality range in terms of used material standards to its customers which would be defined a strategic approach to quality management. The main objective here is to create a brand identity known with product quality. In fact, Tuna tries to answer the needs of the customers in mid-high and high income rate.

Furthermore, technological research covers the information about other manufacturers in terms of production techniques. As well, Tuna reaches to the most critical information about recent developments in production systems via analyzing

other furniture leaders' production lines. Moreover, they get feedbacks from those companies to improve their assembly line. Furthermore, fairs especially about production techniques, material technologies, production tools and also furniture are followed by Tığlıoğlu.

Product languages are defined through the product segmentation since it provides a range that classifies products through their meanings. In fact, Tune defines an executive series segment in which they mostly enforce their design abilities by improving the production quality or materials used and by collaborating with external actors. Those products found in this segment propose most of the communication design yet they are *strategically* well-developed products to emphasize the company's vision. Furthermore, they are represented within an imaginary fictional scenario which draws an office environment. The main objective of this approach is to better communicate with customer.

Existing products are revised or renovated by the help of software archive to overcome recent needs as Tuna gets and archives customer feedback data. Practicing additional improvements on them is another dimension of design to improve functional abilities of those products.

3.6.3.3. Market Entry Phase

The products of Tuna are introduced to the market via various channels like fairs (mostly 2 times a year), workshops, exhibitions, sponsorships, and print media mostly about architecture and furniture and so on. Fairs are the target platforms that Tuna uses to introduce its products. In fact, Orgatec Furniture Fair has the most critical importance since Tuna organizes its entire processes accordingly.

3.6.3.4. Organization of Innovation

The process is organized through a software that collects all the process data for each project. In fact, Tuna has the last 7 years data covering all the information about each product produced. Design brief definition processes are carried out by sales and marketing departments, design department and other executive managers. At the end of

4 meetings, mostly a month, design briefs are defined. In this phase, Tuna collaborates with an external marketing and design consultant company to get feedbacks about the decisions finalized in those meetings.

After having the design brief defined, prototyping process starts which is managed by a foreman. The prototyping atelier is used for those improvements and additional experiments on materials. Design manager has a role of language broker between product development and R&D departments (Tığlıoğlu, 2015b). He translate the languages of design department to R&D managers to improve the prototypes.

Purchases department has a crucial role in the process since they are got involved at the very beginning meetings to analyze the initial product concept in terms of material or production costs.

All those organizations are managed by planning department. The managers here are responsible for not only defining the schedule of the entire process but also collecting reports for each step. Through those reports, new contacts are signed by designers or other actors who are responsible for that specific issue.

3.6.4. Bürotime

The interviews with product managers are carried out with Utkan Kızıltuğ and Özge Çağla Aktaş for Burotime case. For the product case, two products are defined since they are designed within the same process around a brief about developing a product family for meeting activities. It is a new approach for Turkish furniture industry regarding a collection of products that have the same product language to overcome meeting and presenting activities in offices, libraries, hotels and conference halls (Kızıltuğ, 2015). The interviews are carried out with internal designers Arif Akıllılar and Utkan Kızıltuğ and their analysis are represented together.

3.6.4.1. Strategic Dimension

Innovation Approach:
Burotime has the largest sales rates among other office furniture companies in Turkey. Hence, the firm focuses on mainly market research data to provide a wide

product portfolio since the main purpose of the company is to satisfy the needs of various groups of people who live in different cultures (Kızıltuğ, 2015). As well, Kızıltuğ (2015) states that "there are different needs in geographical regions of Turkey; yet, it differs from Van to Istanbul". Meanwhile, there is a user-centered approach in Burotime as regards creating product variations for each customer segment. For instance Kızıltuğ (2015) underlines that Russian market has different characteristics as the customers need low tables to be at the same height with the working table. The marketing team who is responsible for Russian market gives feedbacks about "communist table" so that the design of Cross (see Figure3.6.12) is improved accordingly by adding a serving unit for visitors to it that is at the same level with the working table.

Figure 3.6.12. Cross by Burotime. The low table is designed as to be at the same height with working table for Russian market (Source: Burotime, 2015b)

Design research comprises of listening to the dealers from different countries. They propose insights for the future strategies regarding various cultural design trends. In fact, Burotime tries to balance those insights to create new products that would be sold in many countries. Hence there are many criterions for design as costs, transportation, cultural adaptation and service in addition to the crucial design concerns such as technical functionality and aesthetic.

Design Brief Specification:

Design briefs are defined through the data gathered from marketing and sales departments. The briefs are divided into two as short-term and long-term briefs. The former represents a rapid reaction to enhance the sales of a product segment. They are

defined through the feedbacks of the customers in terms of functional aspects in different countries. In fact, they are characterized by the improvements of the current product segment to create variations for different cultures. On the other hand, long term design briefs are defined to create new product visions as well as many other furniture companies. They stand for to fill the gaps in product segments and they are objected to create a future vision.

Design briefs are mostly formed by sales and marketing departments and after being confirmed by managerial executives, they are introduced to the design department. Besides that, design department would introduce a new design brief if they see a gap in the product family. Moreover, the briefs from external designers may be accepted if they match the firm's objectives.

Designer Selection:

Most of the design activities are held by internal designers but for 5 years, Burotime focuses on collaborating with external designers (Kızıltuğ, 2015). Burotime focuses on the experience and fame of the designers while choosing with whom to be contracted. The company tries to create a corporate vision by working with famous designers and use their fame for advertising, however, the main criteria here is the communication. The designers are expected to be well-communicated with the company regardless of their expertise and product portfolio (Aktaş, 2015).

Managers are responsible for directing the design department to decide on whom they would collaborate with as an external designer. Their acquaintances are the source for those designers.

The Product Case 1: Runner

RUNNER
"The Runner family arranges the times that colleges are together by itself and emphasizes the essential association of functionality and design. No matter how many people involves the meeting or what the aim is, this product keeps pace with the environment and eases the restocking thanks to its flip-top structure. Being both together and separated in the same time is the main theme, which has been used in design, production and usage." (Burotime, 2015d)

Figure 3.6.13. Runner by Burotime. A multi-functional product
(Source: Burotime, 2015d)

Figure 3.6.14. Runner product family
(Source: Burotime, 2015d)

The Product Case 2: Bistrodern

Figure 3.6.15. Bistrodern by Burotime
(Source: Burotime, 2015a)

Listening:

Kızıltuğ (2015) grounds his design source to the market research. This research comprises of international and national competitor data regarding how they approach to the current issue of design. He (Kızıltuğ, 2015) collects the data of recent products developed by other companies in an archive system categorized under the brand names to analyze for the future contexts. Moreover, fairs are the other sources of multi-faceted research where he collects magazines and brochures to better understand the market trends.

Ceramic and automotive sector developments are tracked by Kızıltuğ to get insights about emerging forms, aesthetic perception and hygiene. In addition, internet databases like YouTube channels about production engineering are followed. Design research data about product details by which he is attracted are archived in his Pinterest

account. Furthermore, he uses his networks of designers to get critics and ideas about the concepts he would generate.

Technological research is not the main source of design for Kızıltuğ. He states that the main idea is to the product itself and it would be improved by technological research. Therefore he mainly focus on technological research after concept generation phase. However, when a brief about a new technology introduced to him, he conducts a research to specify if there are any applications by other companies and tries to realize whether it is required for Burotime or not.

Internal actors have the most priority for listening the design discourse as they provide executive information about various market and design trends.

Interpreting:

Product segmentations defines the research data to be focused on for Kızıltuğ. For instance, Kızıltuğ (2015) does not prefer to take notes about his research data since he approaches design as the outcome of his *knowledge*. He (Kızıltuğ, 2015) states: "it is better not to attract the knowledge with additional contexts because it also groups the data and eliminates the irrelevant ones *intuitively* according to the project expectations." Hence, he underlines that intuition is the difference between engineers and designers as regards working without a method for interpretation of listening data.

The initial ideas are interpreted through sketching by Kızıltuğ. Those sketches are evaluated in terms of their convenience to the concept vision which is linked to an imaginary scenario. Product segmentation and the fictive scenarios around the vision reveals the communication design of the product concept.

Addressing:

3D renderings are used to address the product concepts to the other interpreters by both Kızıltuğ and Akıllılar.

3.6.4.2. Operational Dimension

In NPD process, prototypes are objected to the factory from İstanbul. They are represented to the production experts in assembly line since Burotime does not have a prototyping laboratory or atelier. The main approach here is to see the product concept's convenience to the serial production. Hence, improvements on the concept are carried out to overcome the probable problems in serial production. In some cases, concepts are

tested in assembly line even the designers know that there would be fallacies to realize the concept's current evidences. It would be defined as an R&D activity as regards to its nature covering testing and analyzing.

The first prototypes are made up of raw material - without any color if possible - to realize the form of the concept. This phase may be one of the most important phases in which product language design decisions are discussed between sales and marketing departments and designers (or design department). Material selection for those prototypes is not worthy because formal analysis of the product concept is the priority. On the other hand, second cycle prototypes are for representing the product concept with its expected materials and yet colors. In this phase, not only the materials are tested, but also the product concept is further detailed via testing initial detail designs. Here, the criteria for product detail improvements bases on production capabilities of Burotime. In fact, Burotime tries to carry out most of the production process internally. Thus, product language design decision are much more finalized in this prototype cycle. Furthermore, purchases department have an active role in this phase to research for external furniture accessories that are planned to be embedded into the final product or contacts with external producers and suppliers if Burotime decides on a collaboration for production.

The finalized product concepts are tested in Burotime's factory regarding their strength. Those tests are critical for deciding on product languages because the failures are disposed through improvements on structure or testing additional material types. Furthermore, product concepts are tested virtually by external actors to get the optimum solution for the concept.

Technological research in NPD process comprises of research activities to adopt new concept to the production line. It is characterized by market research data since design discourse is listened mostly by marketing and sales departments. As well, Burotime get insights to the design discourse via various channels; one which may be the most important for the scope of this thesis is the target market variety regarding different cultures. Feedbacks from those cultures not only drive design activities, but also pushes production line to be improved to carry out the production of product series that would be introduced to a variety of countries with different needs.

Burotime tries to communicate with its customers via mostly print media and their both national and international dealers yet it is a known brand locally even in small cities in Turkey. Fairs are also other communication platforms as Burotime is presented

in most of the international furniture fairs but Orgatec Furniture Fair which (Acar, 2015; Ata, 2015; Ebeş, 2014; Kızıltuğ, 2015) is the one having the most prestige in office furniture industry. Burotime presents their new products as final prototypes to get feedbacks or recently launched products to analyze latest reactions and adopt strategies accordingly. Furthermore, fairs represent a schedule for product improvements due they have a deadline for submissions. Through that, Burotime adopts its strategies regarding fair dates and concepts to better follow the market and communicate with design discourse.

Furthermore, product communications are represented with their expected environments to take the attraction easily. Here, the main purpose of Burotime is to create a "working culture" and develop new products to synthesize that culture. Hence, the company changes its focus from market research to design research since 2010 (Kızıltuğ, 2015). They try to accomplish design problems with improving their design portfolio by collaborating with *famous* designers and design offices. Moreover, various multimedia channels are defined as the advertising platforms for the firm. In addition, quality management regarding product tests is tried to be improved in Burotime during this period. The codes generated for the approaches of Burotime to design is shown in Table 3.10.

Table 3.10. Strategic approach of Burotime to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Customer needs	Market Research	Competitive advantage	Cost reduction, Functional improvements
Competitors' products			
Culture research			Cultural orientation
Layout design (variety)	Design Research	Brand identity creation and development	Value creation and extension
Packaging		Easy transportation	Modular design, System design
Reduction of material use	Technological Research	Competitive advantage	Cost reduction
Ease of transport			
Ease of production			Cost reduction, Rapid reaction
Ease of raw material access			
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Product group specifications
Product segmentation		Design brief determination System design	

3.6.4.3. Market Entry Phase

Fairs are the most important market launch platforms for Burotime, as well, the firm frames its strategies accordingly. The dealers and international representational offices are other actors involved in market-entry phase. They are informed about new product specifications like technical ones consisting of its transportation, mechanisms, and establishment procedures; or like product language and communication design covering the product concept, its use, the story behind it and so on. TV, radio, internet and all print media are used in market-entry phase.

3.6.4.4. Organization of Innovation

Burotime's production line is found in Konya. All the strategies and management applications are held in the head office in İstanbul. In addition, there is a representation office in Ankara. The organization of the company (see

Figure 3.6.16 3.6.16) is grounded in the head office. A coordination meeting is established in every 15 days. If the agenda in these meetings, executives from the factory or other agents are invited to the head office and yet vice versa in some cases of product development processes.
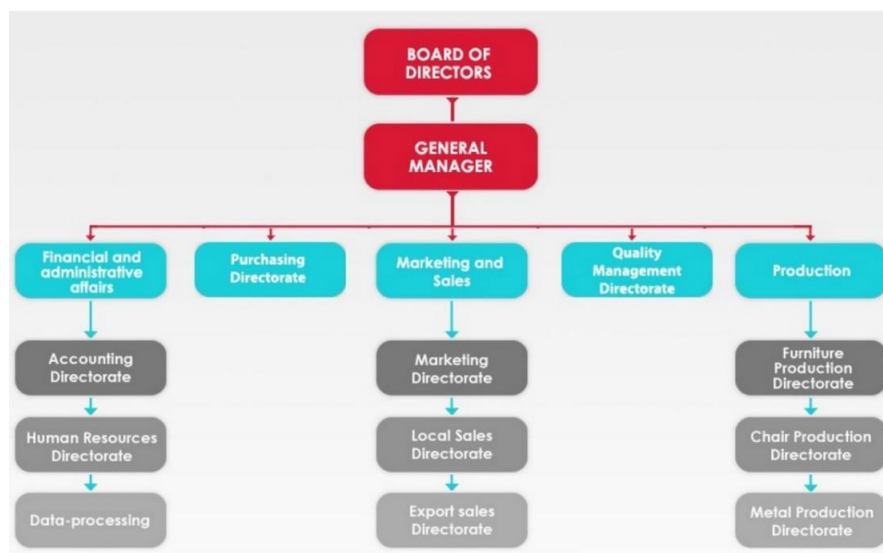
Figure 3.6.16. Organization scheme of Burotime
(Source: Burotime, 2015c)

Sales and marketing departments and design department work close in entire design process. The team managed by a designer between head office and production line is responsible for coordination in NPD process. The team leader is responsible for brokering the languages between external designers and the production line.

3.7. Analysis of Swedish Furniture Case Studies

3.7.1. Offecct

Offecct is analyzed as a case study by Sigolotto (2010) in terms of design-riven strategies adopted in furniture industry. He (Sigolotto, 2010) frames his research under the process and organization of innovation while focusing on the strategic approaches of the companies.

The analysis of this thesis and the one which is provided by Sigolotto are compared to understand if there is a change in Offecct. In five years time, Offecct's strategy is not changed, yet improved, for instance, in terms of sustainability they developed Offecct LifeCircle (Offecct, 2015b) which is devoted to the reuse of the products and raw materials. Furthermore, its managerial employees increased from 30 to 50. Moreover, we determined environment and quality management department that is not mentioned by Sigolotto (2010).

3.7.1.1. Strategic Dimension

Innovation Approach:

Englund (2015) states that their approach to design is based on the principle of "making things simple". Besides that, uniqueness and natural qualities are other domains Offecct takes into consideration. Uniqueness is tried to be achieved via serial production which is supported by manufacturing through human force. In other words, there is a mixture of both handmade and machinated production techniques in Offecct. Englund (2015) states that there is a handmade production tendency in the market since "people actually feel very good to make things by hand."

He (Englund, 2015) likens the approach of Offecct to a *tailor's work* regarding the upholstery of products in which the quality of the skin provided by leather or textile. In fact, Offecct tries to provide a combination of highly qualified materials those which are supported with craftsmanship that is similar to the work of tailors when combining textiles with an artistic style. By this way, Offecct tries to make sense of uniqueness as all the outcomes produced in such cases have a unique language through its natural production process. Moreover, Offecct develops a software in which a mathematical algorithm to achieve uniqueness as described in Figure 3.7.1.

SNOWFLAKES
"The table Snowflakes is designed by Claesson Koivisto Rune. Snowflake is the world's first furniture to be both mass produced and unique. Made of DuPont Corian®, the table is made by using advanced computer software. In this way each table is unique. A poetic and innovative concept! The aim with the Snowflakes table is to achieve the same variation as that found in real snowflakes. A computer programmer developed software that is connected to a milling machine. The machine cuts out the table top precisely according to the instructions of the design team. In this way, the table is machine made but no two tables are alike because the milling program is changed every time within certain preset parameters. For instance, the table always has six points and the same diameter. Snowflakes is a small, useful table which can be combined by using several by a sofa or just one by the bed. The table is available in three different heights in order to increase the possible variations and usages." (Offecct, 2015e)

Figure 3.7.1. Snowflakes by Offecct. A product which is produced by a software to achieve uniqueness (Source: Offecct, 2015e)

Englund (2015) states that Offecct is a small company for considering the rapid incomes of their products so that their prior focus is R&D activities in production techniques aiming to provide unique products rather than the profitability. Meanwhile, Englund (2015) states: "Offecct can effort to do mistakes... and searches for errors". In fact, Offecct tries to develop unique products via technological research on production systems even they do not get profit from the end-products. For instance, *Robo Chair* (*see* Figure 3.7.2) is produced by a unique pressing technique to combine wooden textile with veneer. Even it looks like a plastic chair, it is made up off wooden and so that healthy. In addition, Offecct has a material laboratory where technicians work to research for new material technologies. A variety of materials here in this laboratory

waits to be selected for future applications (Englund, 2015). Hence, a technological research is conducted by Offecct before a product idea is internalized. It would be an extremely strategic phase for innovation.

ROBO CHAIR
"The chair Robo is designed by Luca Nichetto. The design of Robo is inspired by a 1999 music video by Icelandic artist Björk and Chris Cunningham, in which robots become human and come to life. The Robo chair has a completely unique look due to its separated seat and legs. The chair can be compared to a Meccano set that can easily be built on the spot. All the parts fit into a 50x50x20 cm box, which facilitates transport and also meets Offecct's stringent environmental demands.
"I thought the video's concept of robots being constructed and given life was so exciting, and I couldn't stop thinking that it should be possible to do something similar with furniture," Nichetto says." (Offecct, 2015d)

Figure 3.7.2. Robo Chair by Offecct. A plastic like wooden chair produced with a new pressing technique. (Source: Offecct, 2015d)

In addition, Offecct is one of the first companies who consider ecologic effects of production (Englund, 2015). In fact, Offecct starts to develop methods that are eco-friendly in 1992 to save the drinking water lake near the factory. Thereby, handmade serial production techniques are established to achieve a natural way of producing. For instance, *Fly* saves energy since it is made up off textile whose production needs low energies among others. A 3D knitting machine is used in its production (Englund, 2015).

FLY
"The easy chair Fly is designed by Patrick Norguet. A first glance at Fly makes one think of the Far East, and Norguet compares the shape of the chair to the helmet worn by Japanese samurai. Fly has an organic design language in which the fabric itself creates much of the shape by being stretched over the metal frame. Because very little energy is used to make the fabric, Fly meets Offecct's high demands for sustainable production. Offecct and Patrick Norguet worked on the project for four years before the right technology to produce the chair was found.

"It is really not a complicated design. What was difficult was to find a manufacturer who could make the technical textile with the minimum possible environmental impact", says Patrick Norguet." (Offecct, 2015a)

Figure 3.7.3. Fly by Offecct. An energy efficient product with its materials used and production technique. (Source: Offecct, 2015a)

One another approach of Offecct to design in terms of sustainability frames a recycling procedure which is established first in 2014 (Englund, 2015). Englund (2015)

states that "we have a limited source of raw materials" and accordingly, they try to get reuse of their materials. The Offecct products would be recollected from the market to be sold in second-handed markets in Offect LifeCircle system whose philosophy is defined as: "In today's high-tempo world where every company and organization has to focus on its core business, we want to take further responsibility and assist with the maintenance and care of the products we have been entrusted to deliver" (Offecct, 2015b).

Design Brief Specification:

Design briefs in Offecct are mainly divided into two categories as *mini architecture briefs* and *emotional briefs* (Englund, 2015). The former represents an architectural settlement in which Offecct tries develop new products by defining the functionalities of the environment and its relations to the products. Hence, the products designed through this way aim to create an environment in an architecture which has some defined standards like providing huge areas for particular activities in a building Those briefs are framed within functional aspects so that they are more directed than emotional briefs those which represents, for instance, new ways of defining new positive typologies in designing furniture: "For a meeting in a restaurant atmosphere we design the communication where people feel well and it would be an another briefing for design" (Englund, 2015). Moreover, emotional briefs are hard to define since they requires additional *observations.*

Designer Selection:

Offecct looks for different designer portfolios to specify a "hit list" like music lists and clarifies a framework by which they differentiate designers through their likeliness to Offecct's vision and strategies. However, the main expectation of Offecct from designers is to come up with new ideas. Offecct, does not really keen on the experience level or technical abilities of the designers but sometimes, they would get ready-to-develop product ideas from some designers like Khodi Feiz which benefits Offecct by reducing time consumption since it is important for strategic planning and product orientation. Strategic approach of Offecct to product innovation is summarized in Table 3.11.

Table 3.11. Strategic approach of Offecct to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Customer needs	Market Research	Competitive advantage, Trend forecasting	Functional improvements, Life context analysis
Office environmental research		Trend forecasting	
Product language	Design Research	Brand identity creation and development	Value creation and extension
Sustainability	Technological Research	Competitive advantage	Eco-friendliness
Reduction of material use		Eco-friendliness	Cost reduction, Eco-friendliness
Handmade fittings		Product language design	Uniqueness and quality
Material research		Differentiation	Material laboratory
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Concept definition and selection
Product segmentation		Design brief determination	Product group specifications
Reuse of products		Eco-friendliness	Corporate identity

The Product Case: Palma

Palma (*see* Figure 3.7.4) is determined as the product case of Offecct since it has "an enormous radius for wood compression of the seat" (Englund, 2015). Furthermore, the designer of Palma, Khodi Feiz, works with small prototypes (Englund, 2015) in his studio which may provide additional information about the approaches of designers who work with prototypes and mockups in their idea generation phases.

PALMA

"The easy chair Palma is designed by Khodi Feiz. Palma is inspired by the cupped palm of a hand, symbolically cradling the body that sits in it. The chair's elegant form is captured in the seat, backrest and armrests as a single graceful movement. With its frame of molded birch veneer and seamless upholstery, Palma features an extremely elegant design. Above all, Khodi Feiz and Offecct have endeavored to develop a chair with a long lifespan. It must be able to withstand wear and remain appealing to the eye. The chair is clearly informal. Feiz would like to see it used in the home as well as featuring in a professional conference room. He designed the chair to work as a freestanding piece that can also be grouped around a table to give the room a unique configuration." (Offecct, 2015c)

"Palma is a chair to investigate and enjoy. When a child crawls up into the chair, it's entirely different from when an adult gets into it. Children throw their feet up and cling to it in a way we adults do not", says designer Khodi Feiz. (Offecct, 2015c)

Figure 3.7.4. Palma by Offect
(Source: Offecct, 2015c)

Listening:

Feiz (2015) works for various sectors "from consumer electronics, domestic appliances, household goods to furniture and lighting". Most of the companies, except 3 or 4 those which Feiz (2015) works within a structural fashion, from furniture industry are collaborated with Feiz Design Studio regarding a project based process. In fact, Feiz has the chance to translate the knowledge about various experiences into furniture industry by interpreting them in his vision. For instance, a knowledge about characteristics and production of plastics in consumer electronics would be translated into a plastic detail in furniture design. Hence, sector variety is a design source for Feiz which is framed within a multi-faceted research regarding design through knowing about different life contexts and their characteristics to translate into a product language; technologic improvements in different sectors and various market research channels for trend forecasting.

Feiz (2015) has a role of broker of the languages between several actors in project phase since he "acts as a direct partner to the development team". Achieving the *optimum* decision is the critical point of the phases because each actor has to be satisfied with the result in terms of her/his expertise. For instance, management executives give feedbacks about the vision and strategy to Feiz so that he focuses on those concerns until the managers accept the concept. Furthermore, marketing and sales department feeds Feiz in terms of customer insights so as to be interpreted for current project. The *optimum* decisions on the product development process ends with promotion and communication protocol conducted between communication and public relations (PR) departments and Feiz Design Studio. All those various information sources are *executive* since they represent the most attractive interpretations of the experts.

One another source of design ideas for Feiz would be defined in terms of collaboration of the employees working in Feiz Design Studio. In fact there are several designers each of which has "different affinities, such as color and materials, trends, technical developments, and art direction" (Feiz, 2015). With the sensing data they proposed, Feiz Design Studio has chance to elaborate several ideas.

Furthermore, external actors that Feiz meets to create resonance in several fairs provide various information and knowledge. Besides that, the networks provided by collaborated firms is another source for exchanging ideas since Feiz Design Studio tries to "follow leading players in our world both on the design side as well as the brand side"

(Feiz, 2015). Hence, all those various interpreters represents a network based research agenda for Feiz Design Studio.

Technological research bases on researching the internet and media and the channels that Feiz Design Studio established. Fairs and design events are also the sources of information for not only technological developments and their applications, but also for market and design research.

Interpreting:

The interpreting phase for furniture design mostly starts with the initial ideas of Khodi Phase and yet further discussed with the other colleagues working in Feiz Design Studio. Meanwhile, the ideas are collected and evaluated throughout a collaborative work of the employees. Sketches, 3D renderings and initial mockups are used for communication between those interpreters. As well, in some cases for instance designing for consumer electronics, Feiz Design Studio arranges collaborative workshops within the team members to further analyze and interpret data gathered from listening phase.

The ideas are interpreted through some principles such as "clarity, context and concept" (Feiz, 2015).

Clarity: "objects which are stripped down to their bare essence, not to make them boring, but to bring out their main expressive quality." (Feiz Design Studio, 2015)

Concept: "it is the idea that gives meaning to an object; when a piece captures your imagination or makes you look twice. It is from new concepts which new typologies emerge." (Feiz Design Studio, 2015)

Context: "to be inspired by the environment you are designing for is a very strong starting point. Often not thinking of the object but of the context that creates the object can lead to new and surprising results." (Feiz Design Studio, 2015)

Furthermore, some other themes like "architecture, social, warm, ergonomic, meeting, fashion, etc." are taken into consideration during interpretation (Feiz, 2015) regarding the current project. In addition, Feiz Design Studio defines the designer as a specialist who creatively contribute to future scenarios and propositions for culture and society (Feiz Design Studio, 2015). It defines a strategic approach in which design is framed within formal; "designing relevant and beautiful products for our use", technical; "helping industry innovate", communicative; "making information and services understandable" and artistic; "producing work which questions and inspires" domains (Feiz Design Studio, 2015). Those domains specify the basic criterions to create the

quality which is the prior objective of Feiz Design Studio when "designing the inspiration". Moreover, *relevancy*, *opportunity* and *maturity* are the other factors that Feiz takes into consideration while choosing the most promising idea to further develop.

Addressing:

Internally developed initial ideas are represented to the companies via sketches, renderings and mockups. Feiz Design Studio provides additional CAD optimizations for the prototyping phase to better realize the idea.

There is a close relationship between Feiz and the other actors since he acts as a partner of product development team in all phases. Hence, it provides a collaborative work on product language and communication design to synthesize both the company's and the designer's vision in a product. Feiz Feiz (2015) underlines that they spend too much time on communication especially with PR and marketing departments of furniture companies during the development phase so that they would translate the meaning into a communication design.

3.7.1.2. Operational Dimension

The product development process starts with a brief that is defined by Offecct's design department or provided by external designers. In fact, design manager of Offecct gets about 500 design ideas through various channels monthly. A strategic decision procedure is followed by design department to define which designer would be involved in to carry on which project. The decisions on the idea generation phase is framed by a strategic plan called "collection chart" through which the initial ideas are tested and evaluated. Furthermore, this chart is developed and much more specified for each product case to further develop it.

Offecct tries not to introduce their internal company philosophy for not to attract the designers' ideas. After the completion of initial drawings by the designers, Offecct design department and the designer meets to decide on product's materials, production techniques, dimensions, form and colors. Offecct improves the products in its factory by testing them in terms of quality and function. Besides that, an environmental test is conducted.

Offect follows a path in which new product development decisions are elaborated by a schedule:

Week 50 = Starting.

Week 22 = First Prototype.

Week 34 = Second prototype.

Week 40 = Conclusion.

The weeks here start with the first week of January and follows the path thoroughly. During this process, new products are developed within a strict communication between the external designer and design manager. Furthermore, the process consists of the concept, development and production preparation phases.

Language design is developed by interpretations of the designer and design manager of Offecct since they decide on which material and production technique would be established to carry on the project. Through those developments to realize the concept, uniqueness and natural aspects of the product is tried to be introduced to the market. In this sense, Englund (2015) states: "We believe in International hybridism, every designer coming from any country in the world can create Swedish furniture, can actually follow Swedish values."

Communication design is related with the market research analysis by Englund (2015) as he states: "It seems like you keep your ears to the ground. I mean if you know the market, you can also communicate because you know what to achieve". Englund (2015) underlines: "It is about to listen and obtain needs, and deliver new solutions; that's how we communicate and balance the things with the market" Therefore there is not a specific approach to communication design in Offecct but it differs for each individual product idea whose very initial processes are sourced by market research data which covers a communication design approach. In addition, a smart phone application is used for getting contacted with the customers. Furniture fairs are also the platforms which Offecct uses as a communication and branding tool.

3.7.1.3. Market Entry Phase

The products are launched to the product via establishing books, magazines, catalogues etc. as many other furniture companies. The fairs have the most important role for Offect since they represent and introduce their dinal products before launching them to the market.

3.7.1.4. Organization of Innovation

Internal actors are communicated with each other via formal, informal and decision meetings. In fact, Offecct tries to establish various communication facilities to frame a knowledge exchange culture to better develop the product concepts. Various data is shared with all the managerial departments and also the external actors via not only meeting arrangements, but also by the help of digital media - like generating videos to introduce and simulate a problem. Hence, Offecct uses networked databases about for instance product specifications, sales rates, development phases and so on that are updated spontaneously. Therefore, the product development processes are followed and known by the interpreters, so that the concept would be internalized and realized by contribution of various actors.

Offecct has an open source production line through which every actor in the process should get information about design in terms of not only the process, but also the future trends. Therefore, there are always discussions about market needs and future contexts and yet about production techniques in Offecct. Those discussions are carried out in formal strategic meetings (week 8) for future plans by the departments shown in Figure 3.7.5. The organization here is called "collection team" (Englund, 2015). %10 percent (5 of 50) of the managing department works on new product developments.
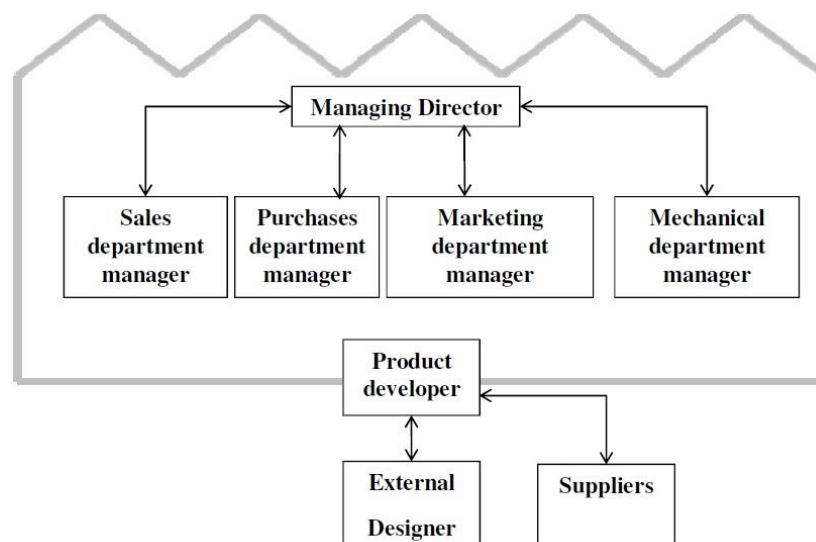

Figure 3.7.5. The Design Council in Offect
(Source: Sigolotto, 2010)

In addition to those departments defined by Sigolotto (2010), a quality and environment management department is involved in the process. Through this way, a standardized product line in terms of quality and being eco-friendly would be established by Offecct to answer future needs since the latter seems to be a critical concern of modern design.

The ongoing products are tested through their sales reports with 5 meetings in a year. By this way, Offecct tries to understand if there is a problem about the product's process.

Offecct collaborates with other producers and suppliers and also designers for new product establishments. There is a close relationship between those actors and Offecct since the entire process is carried out within phases that are distributed to various channels. In fact, Offecct organizes the process in many phases other than production and the assembly of the upholstery parts of the product, and the finishing of the final product. Besides those phases, prototyping and most of the functional tests are handled with internal facilities.

However, even the first prototypes and material tests are carried out in design laboratory by product development team involving quality and environmental management executives, they are asked to other external actors to provide external perspectives in August every year. Englund (2015) states that they have to search for additional comments since they would not look to the product externally.

Further on those actors, Offecct tries to reach external data by interacting with various sectors to internalize different knowledge into their design philosophy and production system. For instance, this research may require an external interaction with the project members of a research in Royal Institute of Technology about the factors affecting human and brain stress in public/private environments.

3.7.2. Skandiform

3.7.2.1. Strategic Dimension

Innovation Approach:

Skandiform's main approach to product design is framed within the concept of "Scandinavian sense" which refers to create, develop and sustain product languages by

means of Scandinavian design culture (Dahlman, 2015). Corporate image and identity creation with those product meanings defined by Dahlman (2015) as "clean design" is the goal of the company. Clean design term here refers to synthesizing various materials and production techniques in a product as to have unique meanings to users with its clean finishes and minimal, but in a sense, more artistic style.

Skandiform's target users consist of mid and mid-high income group so that the company does not really keen on product costs. Instead, the main focus is to better analyze previous traditions – especially those which reflect the Scandinavian design culture –, interpret them with recent technical and socio-cultural trends and develop product concepts for future.

Skandiform tries to balance prices and the quality to sell its products to mid and mid-high income group. Their approach here – may be – defined as *clean* or *Scandinavian* design through the statements of Dahlman (2015) emphasizing the languages of products referring a balance in quality and price on one side; and on the other, meaning so design creating and developing a design culture. Therefore the end-product would be *cleaned* throughout a complex criterion including, meanings, product languages, materials used, and pricing strategy and yet socio-cultural contexts. The designer of our case product Stripe, Oliver Schick (2015b) states:

> "Skandiform has the skills to make modern, timeless and long lasting furniture with a typical Scandinavian sense of simplicity bringing things to the point. I feel honored to work for them -but it is a great pleasure to be the first Non-Scandinavian in their list of well-known designers."

In fact, Skandiform mainly focuses on design research as to interpret the company's vision within an approach framing design at the top level. Mean by, design organizes and manages the whole process via drawing some critical criterions like product language and so the meanings not only to the strategic approach but also to the entire research agenda. Furthermore, through this way, a corporate culture is enforced to be much more design oriented (Dahlman, 2015).

Design research is the matter of the entire company, but especially of the internal departments and marketing executives. The former represents an interpretation of design discourse in terms of special expertise like engineering, design, sales, production, and advertising via researching for proper data to be shared within Skandiform. The latter generates recent product evidences and lifestyle contexts to define and outline future trends. Market research data is improved by those research of marketing executives and

discussed within other various research data. Production and material technologies are researched for new techniques and new applications.

Design Brief Specification:

Design brief are specified through internal meetings held by marketing, design, production and sales departments. 15 managerial executives in Skandiform discusses future strategies in those meetings arranged four times a year. Research outputs about recent trends on design, market and technologies are the source of data regenerated to outline a design brief accordingly. Defined criteria framing the outline here is the *balance* so that clean design; mean by "Scandinavian sense" (Dahlman, 2015),

On the other hand, Skandiform collaborates with external designers who has a defined brief and a design concept dependently improved. Here, the focus is specifying if the product concept is proper for Skandiform in terms of strategies and abilities.

Designer Selection:

Designers who collaborate with Skandiform are mostly Scandinavian designers but there are some other from Germany and France. The main reason for that is the Scandinavian style of design by which the company tries to get value from. Hence the prior approach for designer selection is to regenerate ideas by means of "Scandinavian sense". Moreover, Dahlman (2015) underlines that they have a close relationship with external actors in Nordic countries. Furthermore, the meetings arranged by Kinnarps where the Skandiform products are launched are the sources of designers and architects. The summary of Skandiform's approach to product innovation is represented in Table 3.12.

Table 3.12. Strategic approach of Skandiform to the product innovation

Codes	Categories	Objectives	Product / Process Outcomes
Customer needs	Market Research	Competitive advantage, Trend forecasting	Functional improvements, Life context analysis
Product language	Design Research	Brand identity creation and development	Value creation and extension
Scandinavian sense		Reflecting design culture	
Sustainability	Technological Research	Competitive advantage	Eco-friendliness
Reduction of material use		Eco-friendliness	Cost reduction, Eco-friendliness
Sales / planning strategy	Strategic Approach	Product segmentation, Design brief determination	Concept definition and selection
Product segmentation		Design brief determination	Product group specifications
Design culture		Product orientation	Corporate / product identity and vision

The Product Case: Stripe

Stripe is designed by Oliver Schick, a German designer, with the idea of "an upholstered lounge chair in a slim and lightweight appearing design." Hence, it represents a Scandinavian product language with its elegance and minimal form. A metal underframe with a compression-molded seat frame topped with soft upholstery characterizes the product as to propose Skandiform's vision about Scandinavian design culture.

Figure 3.7.6. Stripe by Skandiform
(Source: Skandiform, 2015)

Listening:

Oliver Schick collaborates with furniture and lighting companies through single product contracts. One advantage of this case is having chance to collaborate with various companies. In fact, collaborated firm variety improves the knowledge about design discourse but the production techniques, material technologies and different approaches to design. Schick (2015c) underlines that he makes research for new brands and companies that could be interesting for him. Therefore, one source of design in terms of the scope of this thesis for Oliver Schick is the interpretations of several actors working in various corporate establishments

Schick (2015c) defines idea *searching* activities as *observing*. He frames these observing activities in term of the furniture and lighting market around "…the increasing tendencies, the needs, the new technical possibilities, the changes of society etc. In all those aspects are hidden a countless number of inspirations for new product ideas." In fact, Schick (2015c) conducts his research as observing "new materials and

new ways of producing" those which have "influence in product design" to get inspirations. Furthermore, he (Schick, 2015c) *observes* the socio-cultural developments with its different facets (e.g. environmental protection, sustainability, quality and ergonomic standards etc.) within the fact that they play a prominent role in design process.

Testing prototypes is another information source for Schick since he works on scaled mockups and models to better realize the product concept. He almost tests the prototypes and materials after having the information about the subject of matter from relevant external actors. This process mostly aims to get better interpretations on product language design, material selection and/or production technique testing processes and its outcomes and yet defines a knowledge source for further projects.

Design blogs and events like furniture fairs are other sources of knowledge about design discourse, especially about what other designers and companies do. The interpretations of these information provides Schick an impression to reveal in which way the tendencies could be evolved in the future. Furthermore, when a new technology or material use is proposed, internet sources about the subject and companies are researched to get contacts of the companies relevant to the subject for further improvements of technical aspects.

İnterpreting:

Through the market data regarding recent trends and technological developments mainly related to production and material choices, the most promising ideas are selected by self-intuition. This intuition covers two main approaches; one is the product character that refers to product language design and the other is the communication design through which the product get meaning in the market so communicates with the user via telling small stories. Schick (2015a) states that: "My aim is to design products with character that are timeless and easy to comprehend. They should be simple in use, in production and even in their idea, without being boring or lifeless." Furthermore, he (Schick, 2015a) emphasizes the balance between functionality and product meaning:

> "In my opinion the narrative aspect of a product is just as important as its function. We are all surrounded by these »creatures« that we use for our daily needs and it is important that they not only fulfill their technical function but also tell us a small story. It is often only minor changes or unexpected details that are needed to give a product a lively character, which sparks the associations and emotions of the user. But the challenge is always to create the right balance between the use and the effect of the product, without being obtrusive."

Schick (2015c) uses mockups and prototypes to test his ideas that would be an interpretation method. Because it provides realized models by which he would select and interpret various ideas even they are related to the product language or its technical developments.

Schick (2015c) does not prefer to work on defined design briefs in contrast to *most* of the designers. Instead, he collaborates with companies after researching about them in terms of proposed similarities between his product concept's philosophy and the manufacturer's approach. In other words, Schick (2015c) tries to bridge the product languages he proposed and the company's vision. In fact, Schick (2015c) focuses on a variety of information for new product concepts without any restrictions of design briefs first, and yet, searches for a manufacturer that would carry on the project. This process continues with initial mockups to better realize the concept and material or production techniques and followed by 3D modelling with CAD software. At the end, the proposed product languages and meanings are expected to be delivered to the market by choosing the *right* manufacturer or supplier.

The supplier's or the manufacturer's vision provides a well-defined outline for communication design. Schick (2015c) defines those interpreters throughout a company search according to their product portfolios and thus the communication problems in terms of product languages and between the actors are minimized when he find the *perfect* match. In this process, he has the role of brokering the languages between several actors like suppliers and manufacturers.

Schick's design studio is used as a laboratory even it is a small place to establish some complex applications. Schick (2015c) collaborates with other designers, 3D modelers and suppliers to solve technical issues (e. g. prototyping) is he cannot carry on the project on his own.

Addressing:

New product proposals are represented by mockups and 3D modelling software outputs to the interpreters like manufacturers and suppliers. Schick (2015c) underlines that mockups are very helpful on addressing the concept to the manufacturers or suppliers since they provide evidence to the idea behind the product. Meanwhile, it is a tool used to address the stories of the products to the other actors in a more realistic way.

3.7.2.2. Operational Dimension

Skandiform has not an internal production line so that the production and improvement processes are outsourced. In fact, the company organizes the whole process by arranging meetings with various actors that are involved in. A warehouse is used to improve, test and control the products or prototypes provided by external producers.

The improvements are discussed in the warehouse by marketing and design departments and also the designers of the current concept. Being decided on the final concept to be produced, Skandiform plans the production process focusing on whom to be collaborated with to carry on.

Product languages are designed in detail in terms of company's vision, style and product line since it is the most prior approach of Skandiform. The main approach here is to synthesize production quality and design meanings to emphasize the whole product line. Skandiform tries to be differentiated by its product identity.

Communication quality between actors is crucial for Skandiform as the firm's main strategy towards the industry requires additional organizational skills due distributing the process requirements to various actors. The information flows between those actors has to be proper to deliver the meanings and techniques that constitute the end-product. Therefore, communication between the actors drives the product communication abilities regarding product language design as a cultural phenomenon, especially a corporate one that would communicate with its outcomes reflecting the company's culture. In fact, Skandiform approaches to communication design not from the product perspective, instead, its focus includes creating a design culture and product vision internally to maintain a better communication design.

3.7.2.3. Market Entry Phase

Skandiform collaborates with Kinnarps which is a brand community consisting of several international office furniture manufacturers whose aim is to deliver products to the global markets (Kinnarps, 2015). Kinnarps has a portfolio of 40 countries to launch the products (Kinnarps, 2015). Their collaboration with Skandiform provides a market launch platform for Skandiform. There are no special events arranged for market

entries of the company's products but the Stockholm Furniture Fair is the most important channel by which Skandiform introduces its products. Moreover, sales and marketing team have a role of this introduction regarding the company's vision about design and culture. Kinnarps channels are used by them to launch the products.

3.7.2.4. Organization of Innovation

Skandiform organizes the whole process in a sense as an external organizer since it has not a defined production line. The communication between internal actors is mostly characterized by informal conversations. Dahlman (2015) underlines that through this way, they can communicate better by sharing individual insights honestly, so that the corporate culture and approaches to design would be diffused to the actors. Moreover, he (Dahlman, 2015) states that the collaborated firms and designers are mostly from Nordic countries to better communicate with due to their similar approaches to design and production, and yet there is an informal communication among those interpreters. However, the decisions on whom to be worked together and the strategic plans including concept generation and development processes are sourced by internal formal meetings. These meeting are arranged four times in a year with the involvement of marketing, production, sales and design executives. The product level activities are mostly organized by design managers and marketing experts.

Kinnarps arranges several meetings where Skandiform has an opportunity to get contact with international producers, designers, architects and management executives and so on to share, interpret and develop ideas. These organizations provide not only the information about latent trends on design, technology and market, but also new collaborations to Skandiform.

CHAPTER 4

CROSS CASE ANALYSIS AND RESULTS

All the interview data regarding company cases are compiled to get insights about various applications that point a difference among other standard methods for product design. In fact, we focused to introduce several applications that would be valuable in terms of their contributions to the process. For instance, we focused on Ersa's consultant company working on workspace efficiency which would be determined as a service design directly affecting product design and its communication, hence we represented it here in Ersa section. One another, we represented product examples from Offecct to emphasize their material laboratory which would be valuable in terms of DDI practices rather than focusing on their standard production procedures supported by CAD operations. In fact, all the cases studied in this thesis have implemented CAD operations to their assembly line and all of them use prototypes for product improvements, but the level of their contribution to the brand and product value and of course to the product language design vary according to the companies' innovation approaches. Some use CAD operations to get a rapid reaction to market pressures via speeding up the NPD processes (e.g. Nurus) while others rely on CAD operations to deliver products that refer to a quality of production (e.g. Offecct, Skandiform). Those approaches may propose discussions in terms of design-driven approach, so that we tried to analyze and discuss their outcomes.

We introduce the general process of design in previous chapter regarding DDI approaches. A country level perspective is adopted here to further discuss those concepts in terms of their market environments, and especially design discourses.

4.1. Strategic Dimension

Technological research for all cases represents the improvements on production and testing systems of the companies. Additional research is carried out by various companies regarding for instance to reduce product costs, to produce better qualified

products, to test product concepts, to design ergonomic products, to transport easily and so on. Those strategies are compiled and analyzed to explore technological research agendas of our cases in different cultural contexts.

Fairs are the most attractive platforms for gathering trend forecasting data throughout a design research. Furthermore, design research refers to a designer research to be collaborated with for all cases of Turkey and Sweden. In fact, all the companies search for designers to whom introduce a project idea but the practices and tools used vary according to the cultural issues and corporate strategies of our cases.

The results are summarized in Table 4.1. in terms of country level analysis of market research agenda.

Table 4.1. Cross case analysis and country level results in terms of strategic approaches and market research

Innovation Approaches

	Codes	Turkish Cases	Swedish Cases
Market Research	Customer needs	Trend forecasting is revealed mostly by customer needs analysis. Competitive advantage is the main objective on improving products according to customer needs. User feedbacks and sales reports are the sources of the analysis.	
	Office environmental research	It comprises of activities and accordingly functionalities carried out in an architectural environment. It reveals an activity research regarding life-context studies. Designers are much more responsible for its implementation to the product since they are the main actors for generating ideas to *reform* them into a product language.	
		Ersa collaborates with a consultant to get feedbacks about the relationships between the products and their environments.	Offecct defines design briefs as mini-architecture briefs in terms of it.
	Competitor' products	It comprises of market research regarding competitor analysis. It mostly refers to competitive advantage by incremental innovations. It supplies data to the trend forecasting and SWOT analysis.	
		Sales strategies in different countries are affected by competitors' product research data.	It is mostly regarded with trend forecasting.
	Culture research	It comprises of the target market research mostly applied by Turkish cases since they introduce their products to various cultures.	It refers to mostly a niche market regarding Scandinavian design culture.

Market research is the main source of trend forecasting practices for all cases. For the Turkish cases, marketing products to different cultures would be an advantage in terms of DDI since they deliver their products to various cultural groups. They would translate those cultural evidences to different product meanings with DDI approaches.

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For both countries, office environment research reveals an activity research which would define existing functionalities in a space, but create new functionalities. Through this way, companies would carry on much more innovative products.

Culture research is related with the target markets. It depends on the cultural evidences of target markets. It is important here to synthesize different cultural outcomes into a new meaning and vision in terms of DDI. For gathering synthesized outcomes, furniture companies would focus on collaborations with various actors from different cultures. Turkish companies have an advantage here since they collaborate with designers from Turkey, Europe and USA while Swedish firms focus on Europe to attract designers. However, we found that there is a lack of systematic research on cultural insights to translate into design for Turkish companies except some cases. Technological research agendas of the case studies are summarized in Table 4.2.

Table 4.2. Cross case analysis and country level results in terms of strategic approaches and technological research

Innovation Approaches

	Codes	Turkish Cases	Swedish Cases
	Cost Reduction	It is one of the most prior objectives since Turkish case companies focus on various markets regarding developing economies and countries other than G20.	It is not a prior driver of design activities since Swedish cases rely on cost reduction in terms of for instance eco-friendliness.
Technological Research	Testing	It comprises of testing the materials and prototypes in NPD processes. Sustainability, durability, material obsolescence, quality and production are the examples of these tests. They are mostly outsourced by all case companies.	
		Ersa, Burotime and Nurus have much more focus on sustainability tests, representing certified environmental management programs in their websites.	Testing the environmental quality of the products is a major criterion for Swedish companies at the very beginning of the design process. Furthermore, Offecct establishes a material laboratory to carry on testing various materials which entails material research.

(Cont. on next page)

Table 4.2. (Cont.)

Reduction of material use	It comprises of reduction of the costs without harming the product languages (Acar, 2015). It provides an improvement on current products via incremental changes.	
	Cost reduction is may be the most important criterion on material use reduction but more than sustainability.	Sustainability is concerned with it since it represents a more eco-friendly product concept with efficient materials used. This approach reveals for further research on material and production technologies in Swedish cases.
Production quality	Production quality reveals product quality, so the brand value. It is mostly about product language design since the quality evokes meanings of the products and the brand accordingly. It drives the research of new technologies that would provide use of different materials and practices in a better way. This represents a competitive advantage to all the cases here. CAD based operations are implemented to the assembly line by all the companies with various objectives.	
	It mostly is defined by product segmentations regarding executive, managerial, operational and vip collections. Turkish cases mainly focus on production quality in different levels through their product segmentations which refers various customer groups even if they follow up quality standards via certifications. The main criteria is here again lowering the costs by various quality management approaches. However, they are using their quality of production as to overcome difficult production problems by CAD operations. Turkish companies object to be valued by their production qualities.	Production quality is related with product language design since Scandinavian cases rely on their products to "Scandinavian sense" (Dahlman, 2015) or Scandinavian design culture (Englund, 2015). They try to emphasize the quality within product languages to create a defined product range rather than changing the quality level of the separate product segments. This provides a brand and product identity. Furthermore, Offecct tries to produce eco-friendly products with qualified production assembly fed by handmade fittings.
Ergonomics	Ergonomics is considered by all the cases by testing and certification procedures	

Throughout the statements above, we would state that Turkish companies are more cost oriented in many cases than Swedish companies regarding the entire research agenda. In fact, their customer groups are involved in various Eastern countries those which are different from European Union (EU) countries in terms of design cultures. The culture here refers to product languages framed by material selection, production quality, and functional aspects and so on. Turkish companies try to balance those market needs with designing throughout a product segmentation in respect to hierarchical

positioning in office activities. For instance, the more attention and focus on executive series in terms of innovativeness would be determined in Turkish companies even they propose innovative products in other segments to emphasize a brand quality or to get increase in sales of some product segments like accessories. The real practices of DDI approaches may be carried on the processes of those products in executive/vip/managerial segments which are oriented to the niche markets or other products in various segments to create a new vision via renovating by Turkish cases.

This approach would be interpreted in two perspectives one which represents a competitive advantage and may be higher incomes via delivering enriched product ranges and accordingly penetrating the market. The other reveals a restriction on DDI practices in terms of time for research and development and establishment costs while focusing on other segments and markets.

Cost reduction would be a strategic driver to design innovative products via interpreting low-cost materials and production techniques through well-defined design briefs. In fact, there are examples of practices to develop low-cost but innovative products in Turkey. This would be defined as a strategic approach in which design is the core driver and R&D for materials is another. On the other hand, Scandinavian companies do not really focus on costs in most cases in terms of profitability. In fact, they mostly approach to design as regards to balancing the costs and product languages. Of course Turkish companies do the same but it is defined via product segments stated above and market pressure affect this balance more than the Swedish firms. Hence, product language design is one of the prior drivers for Scandinavian cases by which they try to create a vision fed by Scandinavian design culture rather than considering the production and establishment costs. This approach reveals a trend research much more based on product meanings and lifestyles. Hence, we would define an improved research of trends in terms of design outcomes for Swedish cases according to Turkish ones.

Testing is held by mostly external actors for all case companies. It entails a technological research regarding material characteristics, environmental effects and structural analysis. The knowledge transfer between the case companies and their testing collaborations have a positive effect on DDI practices if it covers a problem solution and analysis. In Swedish cases, especially in Offecct, technological research is conducted by a material testing laboratory which drives innovation. On the other hand, Turkish companies do not conduct a laboratory based research for testing materials.

Reduction of material use would be considered as cost reduction and besides, environmental friendliness of the products. It drives both technological and design research in product design. Design research agendas of the case studies are summarized in Table 4.3.

Table 4.3. Cross case analysis and country level results in terms of strategic approaches and design research

Innovation Approaches

	Codes	Turkish Cases	Swedish Cases
Design research	Trend research	It is one of the main concerns that case companies and designers focus on. The most important source of trend research is the fairs through which not only the designers but also the companies conduct multifaceted researches regarding market, design and in a sense, technological developments. Other resources of trend research may be listed as fairs about other sectors, editorial magazines, books, blogs, events about other sectors, institutions and so on. However, those listed channels are mostly researched by designers while companies focus on marketing data and recent product showcases.	
	Concept research	Concept research refers to companies' researches about new concepts, mostly proposed by external designers. It would be defined as a research activity to cover initial insights about future trends by researching for designers that would propose future concepts. The competition is to catch best design concepts and designers.	
	Layout design	It refers to layout design in office environments. Functional aspects of design is synthesized to reform the product groups in a harmony and balance. It propose functional spaces. It provides a systematic approach to the product design in which modularity and compatibility are concerned.	
		Layout design is mainly focused on design research of operational systems hence Ersa collaborates with a consultant company to provide services to its customers on office layouts. One of its outcomes is regarded as easiness of its application to various spaces (Tığlıoğlu, 2015b)	It is not a specific concern for Scandinavian cases, however, they rely on it on product level practices.
Design research	Designer research	It is related with the activities and strategies regarding designer selection. The product portfolio of the designer and her/his communication with the case companies are crucial for all cases.	
		Turkish case companies focus on the fame of the designer additionally	Swedish companies rely on designer selection criterions mostly regardless of the designers' experiences and fame, instead they try to combine Scandinavian sense and design culture through selecting the right designers.

Trend research comprises of the research activities related to design trends. The major focus of this research is the product showcases recently delivered to the markets. Both designers and companies analyze current product trends about which they gathered information through fairs and other several resources. For DDI practices, sector variety is important to make analogies in terms of design trends. In fact, all cases here, in a sense, follows recent trends in other sectors as regards to external actors, i.e. designers. Designers and other external actors improve insights on product design trends and introduce them to furniture companies.

Layout design is considered mostly as a driver for operational series in Turkish cases to get workspace efficiency and more functional products regarding layout variety. On the other hand, Swedish companies mostly focus on that in terms of product-specific cases to improve product languages and harmonies. In both cases, it refers to compatibility of products as an approach for design. Space organizations are the research concern here for further developing products.

Designer research comprises of researching for the *right* designers in all cases. Fairs, internet databases, competitors' collaborations and informal relations are the most stated channels where all cases research for designers. In fact, they all research for designer portfolios rather than other non-designer actors like architects. This would limit the outcomes in terms of being innovative since the experience and vision of the actors are restricted to design.

Design Brief Specification:

Design briefs are determined throughout a systematic approach regarding sales and planning data for all cases. They are specified through the research data briefly discussed above. As a sample, design brief statement procedures of Ersa is given in Figure 4.1.1. For other companies, the channels and inputs and their sequences differ according to their approaches. However, we do not really focus on this data here; instead, we frame our research by if there would be other applications to the design brief determinations like external actor inputs. Because DDI proposes a networked research and development process.
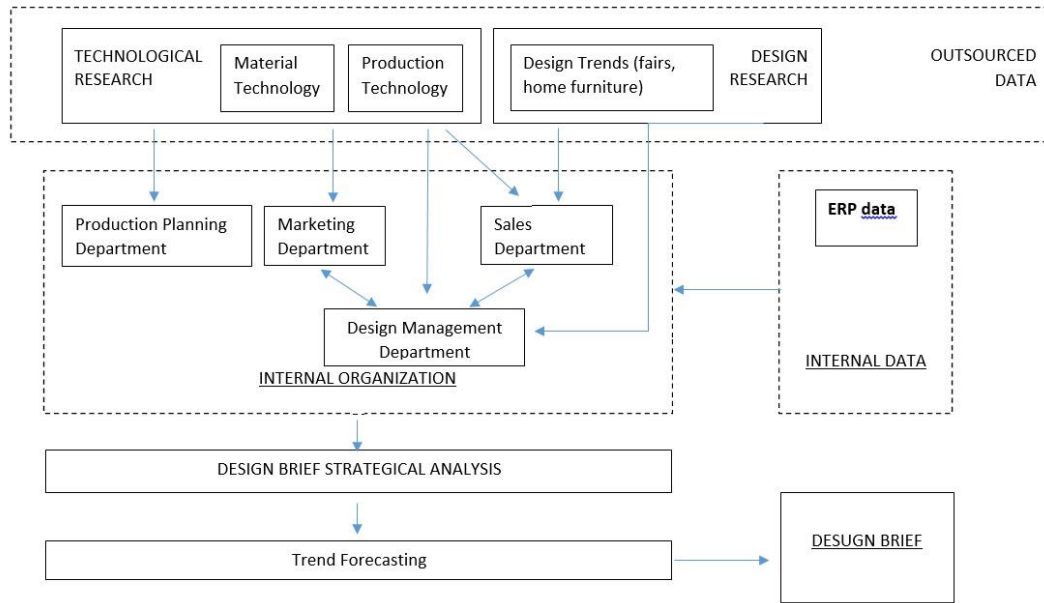
Figure 4.1.1. Design Brief Statement Scheme of Ersa

In fact, there are some cases in which all case companies rely on external designer briefs that come from mostly designers. It would be crucial for DDI to get insights about various perspectives provided by various external and internal actors with different experiences.

Listening:

Designers are mostly fed by similar resources like books, magazines, internet, blogs, fairs, e-mail groups, design related events and so on in all cases. Furthermore, designers have several personal interests like automotive, fashion, arts, and production industries and so on which provide additional insights and inspirations to them. On the other hand, they do not really follow academic and/or institutional organizations like seminars and conferences even if they give lectures or present their knowledge about design. However, design studios are much more sourced with additional sector improvements since they carry on projects with different designers who have experiences in different design projects i.e. consumer electronics. Individual designers are limited with their interpretations unless they do not collaborate with other actors.

In addition, there is a distinction between internal and external designers in terms of project responsibilities. All the cases studied here collaborates with external designers mostly to get their vision to their firms. There are also internal designers who are mostly responsible for project management and improvement processes. In fact, internal designers have a specified knowledge than external ones in terms of knowing the

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internal abilities and practices. Their main objective is to interpret the design concept within assembly line of the companies. Internal designers are not sourced with as many resources as external ones since they work on project improvements rather than collecting data outside. Their main sources of design are grounded by communications with internal and external actors.

Interpreting:

Several methods and tools like mind mapping, noting, making analogies and also sketching are used by designers while interpreting ideas. Idea selection process of designers vary according to their approaches. Main approaches here would be summarized as checking lists regarding product concepts' visions, functionalities, propositions, costs, compatibility with the manufacturers' product range and production line and so on. Furthermore, individual designers get interpretations of company departments about product concepts whereas design studios discuss the ideas internally before presenting to the manufacturers. The latter represents an approach which would be regarded as a DDI perspective via providing additional actors to the process according to the former.

Having a story (or context) is one of the main criterions emphasized by all the designers. It would define a life context in terms of DDI approach. In fact, designers provide different future scenarios in a context with respect to the communication and product language design.

Designers who work with scaled mock-ups and prototypes (Feiz, Schick and Koç) to interpret their ideas. This approach would be beneficial not only to realize the concept initially for further interpretation, but also for addressing the concept to other interpreters.

Addressing:

Addressing to the other interpreters is carried out by 3D renderings, sometimes sketches to address the initial concepts and prototypes (i.e. Feiz and Schick). The story and context of the concepts are represented in those visuals to the internal actors of the collaborated companies by designers. Providing prototypes or mock-ups would improve the communication level and interpretation of other actors to the concept.

4.2. Operational Dimension

The product development processes are mostly similar for all cases. It comprises of prototyping, material selection, product language design and communication design. First prototypes of the products are mostly produced for realizing the visual aspects of the concept. The second ones are for material selection and/or detail enhancements. Others are for further improvements of concepts and changes across the project type and dimension, materials used and also design. The process is supported by several producers and suppliers to overcome internal disabilities for all the cases.

Material selections are based on the product concepts and in Turkish cases mostly to the hierarchical segmentation of the products. Applications on this dimension have not characterized by different approaches, however, material laboratory of Offecct is discussed here in terms of material research. In fact, Offecct develops and applies various materials for the use in their products. This research laboratory is responsible for testing those materials to propose new applications, hence Offecct is one of the first companies introduced Soundwave acoustic panels that are registered and patented. It was the market leader for several years in acoustic panel products. On the other hand, other companies have not such a laboratory internally. Even if they have ateliers for prototyping and testing the materials, they do not pay extra attention to this dimension, as well, they collaborate with external actors for their material researches. Therefore, for being innovative, material research and development would be carried out from a systematic, laboratory based research.

In fact, all companies rely on product language design in various approaches like *Scandinavian sense (Skandiform)*, executive/operational/vip segmentation (Burotime, Nurus, Tuna Ofis, Ersa), uniqueness (Offecct), eco-friendliness (Nurus, Ersa, Skandiform, Offecct), attractiveness to be awarded (Nurus, Ersa) (*See* Table 3.2) and so on. Product languages are defined by operational improvements via material selection and detail solutions and also production techniques. The outcome here, is expected to be affected by those approaches regarding technological research. Hence, the companies having a wide technological research agenda or a research laboratory would have much more chance to deliver better product languages so the meanings and also the value.

"A small but strong story" (Koç, 2015; Schick, 2015c; Tığlıoğlu, 2015a; E. Yalim, 2015), "making analogies" (O. Yalim, 2015), "concept, clarity and context"

(Feiz, 2015) are some references those designers provide to the communication design of a product. Hence all those represent a life context and its communication design. We found that for communicating with design discourse, all the case companies try to define a story behind the concepts. This storytelling activities compile communication design.

Offecct has established a production line to which handcraftsmanship techniques are adopted. Through this way, they aim to get uniqueness. It provides a research area in terms of synthesizing production techniques. It is seen for all cases in a sense, but it is not characterized with uniqueness. In fact, Turkish companies

4.3. Market-Entry Dimension

Fairs are the most important platforms for all the cases to introduce their products. In fact, all the case companies give the most priority to the fairs since they plan their strategies accordingly. However, Swedish companies focus on launching a final product in fairs rather than introducing a prototype as Turkish cases sometimes do. It is due to time and cost planning of the companies since Turkish companies are under pressure of markets to rapidly develop new products. This pressure affects their entire process negatively to create breakthrough innovations.

Moreover, special events like workshops and events about various subjects (i.e. Ersa, Nurus, Tuna Ofis and Offecct) are other platforms for companies to launch their products in addition to showroom and dealer launches. Skandiform launches its product via Kinnarps. Additional advertisement channels like multimedia and print media are used all by our cases. Ersa introduces Box in a Box Idea magazine covering several issues from arts, culture, trend topics, and fashion to design to better communicate with the design discourse while others use several platforms like smartphone applications and articles about furniture industry in their websites. All those communication channels provide market-entry platforms for our cases.

This communication covers introducing the concept, the story or the context of the new products. Hence all the actors involved in market-entry phase must have to be introduced about those aspects. This would be referred with transparency of the processes in DDI practices. In fact, all the interpreters have to get current development information and grounding statements and objectives of the product concepts. Through

this approach, not only the products would be better improved, but also a corporate culture regarding knowledge transfers would be established and diffused.

4.4. Organization of Innovation

Internal organization of innovation is similar for all cases in terms of which departments are involved. In fact, the names and responsibilities and the contribution levels of those departments vary on the companies' strategies, however, it is not our main concern here in this thesis since we focus on organization of innovation in a macro level to specify critical internal actors that would propose insights to DDI practices.

All the case companies define strategic plans throughout formal meetings. Sales and marketing departments are responsible for sales reports and market research data while purchases department provides information about the costs of materials and other external applications. In some cases (Tuna Ofis and Nurus), they are involved in idea generation phases to provide information about purchases costs. Prototyping processes are carried out by mechanical (or production) department if the company has no special implementation for prototyping (Skandiform, Ersa and Burotime). There are representatives in those companies which have an atelier for prototyping (Tuna Ofis) or a material laboratory (Offecct). Furthermore, environmental quality is controlled by an additional department executives in Offecct.

All those internal interpreters are involved in NPD process in collaboration with external actors like suppliers, designers and testing companies. Main distinction between companies relies on who has the broker and mediator roles in this collaborations.

Design managers are responsible for managing the entire process regarding the collaborations with external actors, but the designers. Their roles in this communication would be defined as the broker of languages between internal and external actors. Other departments mainly have a mediator role in this sense by providing external actors portfolio while they are the broker of languages in their department-specific aspects.

Besides formal meetings, the communication is characterized by informal conversations between departments. Through this way, the knowledge is diffused to other actors. In fact, it improves the corporate culture and strategies decided on formal meetings.

For DDI approach, consultancies regarding service design (Ersa collaborates with a company in terms of layout design), research (Tuna Ofis asks for recent market trends and the company's strategies); development (prototyping for all cases) and testing would be crucial since they represent other sources of data that our companies are unable or insufficient to get internally.

CHAPTER 5

CONCLUSIONS

DDI theory suggests that companies who are seeking for innovative products should conduct a research regarding several objectives generated from market, technology and design research analysis. Through this perspective, our cases apply, in a sense, DDI approaches to their strategies. However, this research findings state that furniture companies are mostly focusing on market research data by a user-centered approach for trend forecasting. As well, this data mostly comprises of furniture related industries. From DDI perspective, our case companies are expected to have incremental innovations due to these results. Besides that, our case companies try to be differentiated by creating new forms and especially meanings as regards to technological research. It comprises of testing new materials in a laboratory and adopting new production techniques (e.g. 3D knitting machine) to their facilities. In addition, even traditional craftsman production methods are integrated with serial production to get unique product languages. These implementations improves abilities of companies to create radical innovations according to DDI approach. Therefore, we suggest that furniture manufacturers should mostly focus on technological and design research rather than market research.

Design research refers to recent product trends to be analyzed for forecasting future in furniture industry. Research data is analyzed throughout a defined product segment. In fact, product segmentation frames design research to select relevant knowledge sources and yet the product ideas. Furthermore, this approach, at the same time, is used to define design briefs. Hence, throughout this thesis, we propose product segmentation as one of the core drivers of DDI.

Activity research is another aspect we add to DDI research approaches by this study. In fact, researching for office activities and focusing on the environment dependently creates new visions for DDI practices. Because it represents an imaginary life context in which activities and products are generated together. Through proposing multifaceted contexts regarding products and their environments, the outcomes are expected to be better addressed to the desired contexts. Hence, not only existing product

segments would be improved but also new segmentations would be created through this way.

Searching for ready-to-interpret concepts is another result of this thesis since all the case companies listen to design discourses to catch best concepts. It is a competition for furniture companies to search for, define and attract the right actors before their competitors. In fact, this research needs not only a network management program to reach to the right actors and their concepts, but also a vision emphasis on design projects. Hence, the communication of companies with design discourse is suggested to be improved by a network management approach while brand identity, vision and abilities are well introduced to the actors to attract the most promising ones.

In terms of country level perspective, we found that Turkish companies are much more cost oriented according to the Swedish companies in most cases. It is about the target markets and cultural differences. In fact, Turkish companies try to balance various markets having different cultural needs. Therefore, their product segmentation differs from Swedish companies and yet the product strategies accordingly. Turkish companies pay much more attention to design in their niche segments to create innovative products qualified with interpretation of external designers. We found that the more they diffuse this approach to other segments, the more they would be innovative. Hence, product segmentation and cultural differences would generate DDI practices.

This study reveals that Swedish furniture companies ground their approaches to Scandinavian design culture. Even it provides an elegant product language to them, they are in a sense lack of additional cultural interpretations. They are suggested to be collaborated with various actors from different cultural backgrounds. In a similar sense, Turkish companies are proposed to interpret their variety of cultural knowledge in terms of global markets' future trends.

Throughout this research, it is suggested to furniture companies to arrange and attend to several organizations regarding various sector changes to discuss and develop future plans collaboratively. In addition, they should organize various projects different than their traditional approaches like organizing and supporting research based practices carried out different groups of people like sociologists, architects and artist from various cultures.

Delivering innovative products in terms of design is not only a company based phenomenon since companies represent them to the cultures. Hence, developing countries like Turkey would develop policies that improve design culture with not only

supporting design activities, but also education policies. Furthermore, design discourses and technology clusters would be better organized with periodical meetings in terms of material and production improvements and also design.

In conclusion, throughout this thesis, we revealed some drivers for DDI like laboratory based research, product segmentation, activity research, culture research and concept research. Those research agendas and approaches would add various perspectives to DDI theory as dynamics of DDI since we found that research agendas characterize the end-products. As well, we defined those drivers as to be the genotypes of DDI. Firms would organize and systematize their strategies according to researching for various effects of those dimensions on their product innovation practices. They should test and analyze their approaches across several research areas since there is one more way to get one specific objective.

We explored DDI practices of furniture industries in Turkey and Sweden from a macro level defining main characteristics and actors of several dimensions. Further research would be conducted to specify each dimension in detail to deepen the exploration. Furthermore, additional research would be conducted in terms of country policies and DDI relations to provide various approaches and practices to the theory.

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