Organizational variables influencing the creativity of industrial designers: the IFI S.p.a. case study

Abstract

The aim of this paper is to identify the organizational variables that favor the creativity of industrial designers in the creative and innovative processes of enterprises. After reviewing the marketing literature on industrial design and creative and innovative processes, a case study analysis was carried out. The subject of the study was a design-driven Italian company, IFI S.p.a., a leader in the bar and ice cream parlor furnishings sector. The results of the analysis show that the main variables which positively influence the designer's creativity in enterprises are the creative role of the entrepreneur, the organization's orientation toward creativity, and the characteristics of the teams and their tasks, especially regarding whether or not they have the freedom to experiment and the degree of heterogeneity of skills.

Key words: creativity, innovation, industrial designers, organizational variables, business to business market, enterprises

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1. Introduction

While the interest in product innovation has always been very high in marketing and management studies, the strategic role of design-driven innovation has received increasing attention only recently (Dumas and Minzberg 1989; Verganti 2006; Rindova and Petkova, 2007; Bettiol and Di Maria 2014).
Empirical studies have shown that the industrial designer has a positive effect on the innovative capacity of firms and on business performance (Berkowitz 1987; Lorenz 1986; Walsh et al. 1992; Gemser and Leendders 2001; Veryzer 2005; Landoni et al. 2016). In fact, in order to compete in international markets, companies must introduce innovative products that feature an original combination of functional, technological, aesthetic, intangible, and symbolic aspectcs (Symbola Foundation 2014; Micelli 2016). Therefore, in the creative and innovative process, companies should involve not only the R&D and marketing departments but also the industrial design department (Bettiol and Di Maria, 2014). Industrial design must be understood, in the broadest sense of the term, as a project of functional, technological, aesthetic, and emotional value (Lojacono 2000).
This paper aims to answer the following research question: what are the organizational variables favoring the creativity of industrial designers in the creative and innovative processes of enterprises? This study is based on the case study analysis of an SME operating in the B to B market; the company is a leader in the wooden bar countertop sector, whose value proposition formula is the creation of "beautiful and well made" products resulting from creative and innovative processes in cooperation with industrial designers. The study highlights the role played by industrial designers in the radical innovation of a product and shows the major organizational variables that favor their creative contribution.
The paper is organized as follows. In §2 we clarify the concept of industrial design, discuss the role that it plays in the creative and innovative process of a company, and identify the main organizational variables that foster creativity in the company. In §3 we discuss the methodological aspects and analyze the case study. In §4 we present the empirical results. Finally, in §5 we suggest some managerial implications arising from the research.

2. Theoretical background

2.1. The concept of industrial design

Despite the lack of systematic theories on industrial design and the great ambiguity surrounding its definition (Berkowitz 1987; Kotler and Roth, 1984; Block 1995; Walsh 1996; Luchs and Swan 20011), more and more marketing and management scholars have adopted a broad definition of industrial design which goes beyond the aesthetic aspect to include other aspects such as ergonomics, ease of manufacture, efficient use of materials, user friendliness, functional performance, and so on (Gemser and Leenders 2001).
Norman (2004) states that Emotional Design must satisfy three conditions: the Visceral condition linked to the immediate impact produced by an object, the Behavioural condition relating to usability, and the Reflexive condition that refers to the personal and the social meaning that a particular product has. Similarly, design has been defined as "the set of activities that focus on the integration of functional, emotional, and social utilities" (€Design 2013).

While in the past *design* was a niche phenomenon linked to luxury small-series production, today it has become a democratic and "mass" phenomenon that is combined with industrial production. In addition, it involves a growing number of industrial sectors: from furniture to automotive, from personal accessories to industrial markets and the services sector. Ikea and Apple are emblematic examples.
The background of Italian designers is based on the wealth and diversity of the Italian cultural heritage, unlike German designers, whose formation mostly stems from a strong industrial culture, and Scandinavian designers, whose expertise is based on a consolidated training system (Sabbadin 2011). Nationalities aside, the two main barriers to cooperation between companies and designers are the lack of a common language on design and the poor analysis of the dynamics that characterize the relationship between the investment in design and the competitive performance (Swink 2000; Wallace 2001; Chiva and Alegre 2009).

2.2. The role of industrial design in the enterprise's creative and innovative process

Creativity is the ability to create new and useful ideas while *innovation* is the ability to translate ideas into action (Amabile et al. 1999). The concept of creativity is related to knowledge, which is the key resource that favors creativity (Nonaka 1994). It manifests itself through the generation of new ideas that result in new knowledge of a process of scientific or social validation (Csikszentmihalyi 1999). Innovation takes place only through the productive application of new knowledge and/or

new combinations of existing knowledge (Pencarelli et al., 2013).
A company's creativity is influenced by individual, team, organizational, relational, and external environment elements (Bilton 2007; Montanari 2011). Business creativity requires "creative" individuals as industrial designers. At the same time, a company needs favorable variables without which the individual creative characteristics may not emerge in all their potential; sometimes one or the other variable may prevail (Pilotti 2011).
The creative contribution of the industrial designer contributes to strengthening the company's creative capability (Napier and Nielsson, 2006), that is, the distinctive skill necessary to develop and maintain a unique and original selling proposition (Nebenzahl and Jaffe 1996). More specifically, the designer contributes to strengthening what Landoni defined as "design innovation capabilities" (2016, p.487) or, in other words, as "the capabilities that enable companies to innovate their products' functional (performance, functionality), social (how am I perceived by others?), and emotional (how does it make me feel?) utility (€ Design 2013)".

Design-driven innovation adopts an incremental and holistic managerial logic, and sees the company as an integral part of a network of companies and professionals (e.g. customers, suppliers, research institutions, business partners, consultants) that manages this process in a collaborative and co-productive way (Rothwell 1994; Nonaka and Takeuchi 1995; Von Hippel 1988). However, design-driven innovation has recently been receiving increased attention (Dumas and Minzberg 1989; Verganti 2006; Rindova and Petkova 2007; Bettiol and Di Maria 2014; Micelli 2016). The innovation literature has, in fact, attributed to customers (especially to lead users) a very important role as a source of knowledge to understand the future needs of the demand side and to collect useful information for the design of new products (Von Hippel 1988). In addition to the study of demand, other determinants of product innovation are technological change and historical analysis of successful products (Goldenberg and Mazursky 2003).
Several studies have shown that industrial design (Dorst and Cross 2001; Walsh and Roy 1985) is essential for product and process innovation (Perks et al. 2005; Bogers and Horst 2013) to increase a company's competitiveness (Borja de Mozota, 2003; Swan et al. 2005). In particular, many studies have stressed the existence of a positive link between investments in design and business performance improvement (Swan et al. 2005; Chiva and Alegre 2009; Landoni et al. 2016).

2.3. Organisational variables influencing the company's and the designer's creativity

As mentioned above, the literature on corporate creativity has identified the organizational and relational factors that can encourage creative contribution in a firm. They are summarized below, in Table 1.

Table 1 Organizational variables favoring corporate creativity

3. Objectives and methodology

As stated above, the research question this work aims to answer is the following: what are the organizational variables favoring the creativity of the industrial designer in the creative and innovative processes of firms? To answer this question, the literature on innovation, creativity, and industrial design was reviewed, emphasizing the importance of industrial design in creative and innovative processes and of organizational variables that encourage creativity (§ 2). Then, in § 4 a case analysis is conducted on IFI S.p.a., a leader company in the bar furnishings industry; over the last ten years, this company carried out radical product innovations using an innovative design which led to a steady growth in business performance.
The study adopts a qualitative and exploratory-descriptive approach and uses the case study method (Eisenhardt and Graebner 2007; Yin 2009; Tsang 2013). The phenomenon under study is still largely unexplored and complex because it includes many variables. The case study was analyzed through the following research techniques:
- semi-structured interviews with the entrepreneur, the R&D and Marketing managers, and a famous designer;
- analysis of the company documentation (catalogs, brochures, etc.) and the information available on the company website;
- participant observation by one of the authors during some guided factory tours.

The interviews were aimed at understanding the radical innovative process of a product, from the creative phase to the product launch on the market, and the role of the industrial designer in

such processes. This was achieved by asking the interviewees to evaluate the impact of organizational variables on their creativity, a scale of high, medium, or low. The interviews lasted about an hour, and they were conducted and recorded in the period between September 2015 and February 2016. The interview transcript was approved by the respondents. The mix of instruments chosen allowed the research team to increase the internal reliability of the data (Yin 2009).

4. The IFI S.p.a. case study

4.1. The company and its products

IFI S.p.a. is a medium sized company with 340 employees, located in Pesaro, in central Italy. Founded in 1962, today it is a leader in the field of bar and ice cream parlor furnishings. Its international market presence includes Europe (especially France, Spain, and Germany), Asia, and America with exports amounting to approximately 50% of company turnover.

The products range lines are ice cream display and dipping cases, bar counter tops, snack display cases, and refrigerated cells. The customers are ice cream parlors, bars, pastry shops, restaurants, self-service cafeterias for snacks or food, canteens, and roadside restaurants.

Since the late 60s the company has used design as one of the main levers of its success, first, by working with MH design studio of Makio Hasuike in Milan and later, establishing collaborative relationships with numerous freelance designers, such as Marc Sadler, Francesco Geraci, Giulio Iacchetti, etc. In just a few years, the company became a market leader through the concept of "useful design", i.e., design that combines functionality and aesthetics.

The beating heart of the company is the research and development department, which effectively collaborates with the marketing department and external designers. There are three main proprietary products which, for the last fifteen years, have distinguished IFI, obtaining important international awards for innovation and design (see Figure 1): *Start Up, Tonda*, and

Bellevue with Panorama® technology.

Start Up is a complete and not expensive furniture bar system targeted to young people intending to start a new business. It has been created in collaboration with the desigers Giorgio Di Tullio and Raffaele Gerardi. Start Up has received the Grandesignetico Award in 2012 and the Honorable Mention at the Compasso d'Oro International Award in 2015.

Tonda, which won the XXI Compasso d'Oro (Golden Compass Award) in 2008, is probably the most revolutionary product and the emblem of the IFI growth path; a refrigerated display case created in 2005, it was a milestone in the growth of the ice cream parlor furnishings sector as the first round, rotating gelato dipping case made in collaboration with the designer Makio Hasuike. Finally, *Bellevue with Panorama® technology* has revolutionized the way ice cream is stored in the dipping cylinders by combining two elements which were always so far apart: the perfect ice cream storage method and its maximum visibility. In 2014 *Bellevue* was awarded the XXIII Compasso D'Oro.

Figure 1 – IFI's main products

4. 2. The creative and innovative process and the role of the industrial designer

In IFI the creation of new products typically involves the participation of industrial designers and possibly of architects, sociologists, universities or other educational institutions. The radical innovation process is based on team work, on the integration of know-how and different skills, which involves the R&D department, the designer, the marketing and the sales areas.

The R&D department, the heart of the company and the engine of innovation, is composed of a team of more than 30 internal staff members (about 10% of company personnel) who are thermodynamic and electronic engineers, designers, technicians, and researchers who develop projects independently or in cooperation with industrial designers. The department is composed of two areas: the technical office (technology design, aesthetic design, and prototyping) and the thermodynamic and electronic design area (laboratory tests).

Figure 2 – The process of developing a radical innovation product at IFI S.p.a.

The radical innovation process (Figure 2) begins with the ideas developed by industrial designers; ideas are often expressed in the form of sketches and a brief one-page description or rendering. The R&D Director explains that: "the designer

receives a very soft brief, the scenario, and has to create a realistic viable project, based on a few basic constraints in the sector. For example, a constraint can concern the display case windows: given the low consumption, the company cannot make large investments to produce special glass." The designer can intervene on form, on the way something will be used, on the technology, and on the materials. Then, the IFI team decides whether to proceed or not, following the team work in which all the different experts are continuously being asked for their input on the various steps of the creative-innovative process. The company tries to maintain the designer's initial idea and will make corrections only if necessary, e.g. if they exceed the costs of industrialization. There is a trusted "warm" relationship between the designer and the company, creating a good environment in which problems can be identified (problem-finding) and solved (problem-solving) together.

After the first step of the innovation process there follow the phases of maquette (a kind of pre-prototyping), the legal protection of ideas, and the structural, thermodynamic, electrical, and mechanical design. In this last step forms are translated into technical details that will make up the various products and subsequently, components are studied and defined individually in every detail so they can be represented in construction drawings.

Before starting the production phase, the prototypes are made in order to analyze the possible aesthetic, ergonomic, construction, dimensional, or functional issues and to ascertain the product's economic sustainability. The prototypes are subjected to functional tests in climatic chambers to measure their performance under extreme conditions of temperature and humidity. From these analyses, it is possible to correct or make adjustment to the drawings; at this stage, even the marketing and sales departments can suggest improvements to the prototype.

Then, the pre-series production (1-5 pieces) starts: in this phase a few customers test the product, orders are collected, and it is possible to obtain a final quantification of the industrial cost of the product. Finally, the series goes into production.

These steps are never rigidly sequential, but are sometimes parallel. From the formulation of the idea to the start of production, it takes a year and a half, on average, and for complex projects, five years.

As regards instead incremental innovations of the product, they are limited to small changes suggested by customers. The organizational responsibility for these innovations is assigned to the technical office.

4.3. The organizational and interpersonal variables that favor the creativity of the designer

The main organizational and interpersonal variables that favor the creativity of designers in IFI are: 1) the entrepreneur's creative role, 2) the orientation that the company shows towards creativity, and 3) the characteristics of tasks and teams (see Table 1). These are the variables that respondents evaluated as 'high', on a high-medium-low scale.

Concerning the first variable, the entrepreneur was and is very passionate about design; he was the first to bring design into the bar furnishings industry in the late 60s and he has always supported the use of design as a corporate strategic tool. The company founder also directed the Italian Design Association for regions Marche, Abruzzo and Molise, and the local trade association, Confindustria Pesaro and Urbino. He invests both culturally and financially in creativity and design, adopts a participatory leadership style, and stimulates the creativity of his employees.

Moreover, he chooses industrial designers who have never had experience in the industry because he believes that they are less biased and freer to express themselves. He has fully understood the role of the industrial designer, in the broad context of a complex industrial project that must combine functionality, technology, aesthetics, and values. In fact, the company does not cooperate with designers merely to aesthetically "refine" its products or to get ideas, but it "entrusts" the product to the designer's creativity and supports it throughout the innovation process until the launch of the product on the market.

Turning to the orientation of the enterprise toward creativity, the entrepreneur has shaped the corporate culture concerning design, effectively communicating to the innovation team the importance of developing an informal relationship and a feeling of connectedness with the designer. Furthermore, as already noted, he grants freedom of expression to the designer despite the basic constraints.

A basic rule within IFI which effectively expresses the company's orientation towards creativity is to let industrial designers participate in all phases of the creative and innovative process, from the development of ideas to production, by providing minimum initial indications and granting wide degree of experimentation. More generally, the company does not punish mistakes or failures because they are integral elements of the creative and innovative processes; rather, it fosters collaboration and an informal working atmosphere.

Moreover, those who are involved in creative and

innovative processes are rewarded with career advancement and financial rewards that are also tied to corporate awards earned, such as the Golden Compass.
With regard to the characteristics of tasks and teams, the creative contribution of the individual is stressed, particularly with respect to the achievement of a common goal, i.e., coming up with an innovative product that can create value for customers and solve their problems. There is strong freedom of expression in accordance with the established constraints and the different skills of the many professionals involved in product innovation are enhanced.
Respondents believed that the other organized variables examined (pressure in an organization, resources invested in support for creativity, relationships that the company establishes with external networks) exert medium influence on designer creativity, based on a high-medium-low scale. The study showed that in IFI there is no strong pressure exerted by the enterprise for radical innovation in terms of product deadlines or excessive workloads that would limit creativity and innovation. Indeed, the radical innovation process of the product has a variable duration ranging from one to five years and the innovation team involved can manage its tasks without undergoing particularly tiring and stressful periods.
In addition, the company invests financially in design. This can be considerable, especially for the most famous designers or "superstars" who command an initial fee and royalties as a percentage of turnover.
Finally, as regards the relationships that the company establishes with external networks, the interviews showed that the company has joined networks with business partners, with trade associations such as ADI, Confindustria Pesaro and Urbino and Confindustria Marche, with design universities, and with the University of Urbino. These are important relationships that contribute to favoring corporate creativity. The "Innovation and Design" project is emblematic of this type of relationship; it was promoted in 2015 by IFI's owner and implemented by Confindustria Pesaro and Urbino with the aim of integrating young industrial designers in local SMEs (Conti and Pencarelli, 2016).

5. Discussion and conclusion

The study shows that in IFI S.p.a. industrial design is understood in its broadest sense (Lojacono 2000) and it highlights industrial design's strategic role in creative and innovative processes (Dumas and Minzberg, 1989; Verganti 2006; Bogers and Horst, 2013), thus strengthening company competitiveness (Swan et al. 2005). In particular, the study shows that the organizational variables that mainly influence the creativity of designers are: 1) the entrepreneur's creative role (Napier and Nilsson, 2006); 2) the orientation of the organization towards creativity (Cummings 1965; Oldham and Cummongs 1996); 3) the characteristics of tasks and teams (Goldberg and Mazursky 2003; Bilton 2007).
Therefore, the study confirms that in order to increase the creative capability (Napier, Nilson, 2006) and the design innovation capabilities (Landoni et al. 2016) of companies, it is important that there be both the presence of "creative subjects" which provide the creative input and internal company factors which support individual creativity (Bilton 2007). Coherently with the extant literature therefore, one cannot attribute a company's creativity only to individuals but increasingly to collective elements (Bilton 2007). In addition, this study confirms that the industrial designer plays a role of integration and synthesis between technology, communication, and marketing (Sabbadin 2011), involving several technical and marketing professionals.
In this study it also emerged that in the bar and ice cream parlor furnishings sector the suggestions provided by customers are important to the incremental innovation of products but not significant for radical innovations. This consideration does not correspond to what the literature on innovation has so far sustained, that the demand is the central source of knowledge for the design of new products.
With regard to the first organizational variable that affects the creative input of designers and the creative role of the entrepreneur, the study confirms that the company's creativity should be supported and stimulated first of all by the owner. The entrepreneur-owner of IFI has a strong passion for design and was the first to identify and grasp opportunities related to industrial design, transforming the business from artisanal to industrial, thus becoming an industry leader. Investing in design ever since the 60s, the company has created a knowledge base of design experience, an aspect that in addition to investments in design, contributes to the growth of design innovation capabilities, according to Landoni et al. (2016).
The participatory leadership style (Napier, Nilson, 2006) of the company represents the necessary condition to making creative and innovative processes open to outside influences and to leave employees the freedom to act. The entrepreneur/owner determines the company's orientation towards creativity (the second important organizational variable that fosters creativity at IFI), especially by encouraging people to take risks (for example,

the words “it cannot be done” are banished from the company) and to not be afraid of making mistakes (Cummings, 1965) as well as by establishing open and collaborative relationships with subordinates (Delbecq and Mills 1985; Oldham and Cummings, 1996).
Concerning the third organizational variable, the characteristics of tasks and teams forged by the company culture, it is worth noting that the team involved in the creative innovative process possesses a variety of different skills (Mumford and Gustafson, 1988) related to R&D, marketing, and industrial design, and that among them there exists a “warm” relationship of trust. In summary, there is a strong bond between the members of the team that deals with innovation. The freedom of expression granted to the designer despite the constraints helps develop the designer’s and thus the company’s creativity (Goldberg and Mazursky 2007).

It is interesting to note that the study revealed several factors, which have been neglected in the literature until now, that foster the company’s creativity: 1) the value of working with an industrial designer who lacks experience in the company’s industrial secotr, 2) the role of “warm” and informal integration and interaction between the designer, the R&D, the marketing and the sales departments, and 3) the involvement of designers in all stages of the innovative process, not only in the initial creative phase but right up to the launch of the product on the market.
The study suggests some preliminary managerial implications for enterprises and for policy makers. Enterprises that want to remain viable and competitive should seek to collaborate with industrial designers to encourage the development of continuous qualitative development paths based on creative innovation. The industrial and land development policy- makers are called to support creativity by introducing regulations and granting loans to favor the whole industry, both at district and territory levels, by activating public and private networks in which local authorities, research centers, universities, enterprises, industrial designers, and trade associations are involved. Moreover, it is necessary to enhance the cultural heritage factor, as it is the fundamental resource on which creativity is based.
The main limitation of the study is the use of a single case study which, although it does not allow the generalization of the findings, does allow a preliminarly answer to the research question. The framework needs to be tested on other cases and further developed to include other variables from the external environment. Future research on design-driven innovation should investigate external environmental factors that encourage designer creativity. Other areas that have been underinvestigated in the management literature on industrial design concern how design impacts on business performance and the role of the distribution and communication phases of the product to understand the value of a design product.

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Table 1 - Organizational variables favoring corporate creativity

Organizational variable	Description
The creative role of the entrepreneur	The ability to identify opportunities, to perceive risks, to establish a connection with the environment, and develop a collaborative leadership style (Napier and Nilsson, 2006).
The orientation of an organization toward creativity	This orientation means being willing to take risks associated with the creative process (Cummings 1965; Delbecq, Mills, 1985), to make mistakes, to give positive feeedback to people (Amabile 1996), to recognize creativity with economic incentives and career opportunities (Amabile et al. 1996). It also entails fixing clear and precise objectives and establishing open and collaborative relationships with subordinates (Delbecq and Mills 1985; Oldham and Cummings,1996).
The characteristics of task and teams	Tasks and activities of individuals and groups must be designed to influence creativity; creativity is greater if people and groups enjoy freedom and autonomy with respect to constraints (Goldenberg and Mazursky 2003) and if the team has different skills, safety (Mumford and Gustafson 1988) and freedom to experiment with different roles (Bilton 2007). Group learning develops the ability of people to look at the bigger picture, beyond individual perspectives and to understand its complexity (Senge 1990).
Pressures in an organization	There are two types of pressure: one exerted by deadlines (there is an inverted U relationship between creativity and pressure) and one related to workload (which always has a negative influence on creativity) (Amabile et al. 1996).
The resources invested to support creativity	All of the resources, whether financial or not, that an organization provides to its members to stimulate creativity (Montanari 2011).
The relationships that the company establishes with	The company joins a community of practice of designers and more generally, is a member of networks that stimulate creative activity (Bilton 2007). In the perspective of the network model

external networks	and of open innovation, innovation is the result of the interaction between companies and actors.

Source: our extrapolation

Figure 1 - IFI's main products

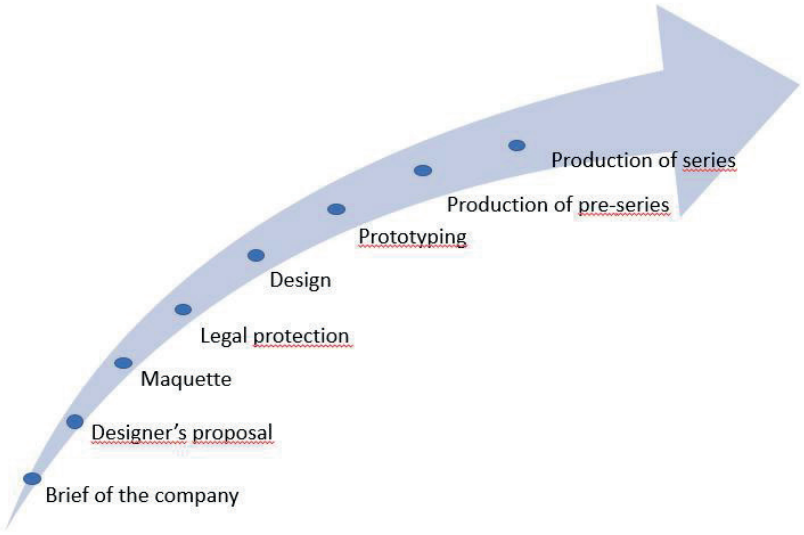
Start Up

Tonda

Bellevue

Source: www.ifi.it

Figure 2 - The process of developing a radical innovation product at IFI S.p.a.



Source: our extrapolation