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THE ROLE OF DESIGN IN UPGRADING WITHIN GLOBAL VALUE CHAINS. EVIDENCE FROM ITALY.

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The role of design in upgrading within Global Value Chains. Evidence from Italy.

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Abstract

The concept of upgrading plays an important role within the global value chain (GVC) theoretical framework (Gereffi et al. 2005). The globalization of supply chains and the presence in the market of low cost producers coming from emergent economies pose serious threats for business that based their competitive advantages on efficiency and manufacturing. Although the literature gathered important results in highlighting the economic impact of upgrading, little research has been done on how design is used as a strategic tool for product innovation within the firm (Ravasi and Lojacono 2005) and how it improves the capability of the firm to upgrade within global value chain. This paper aims at shedding light on the evolution of the role of design in the firm's strategy and value creation. We decide to focus our research on Italian Small and Medium firms (SMEs), with a special interest on those coming from Italian Industrial Districts. The aim of this paper is twofold: a) to study how design is evolving within leading firms and which are the implications of this changes in terms of knowledge creation and sharing, b) to analyse and investigate the relation between design and company's performance. To this end, the authors have assessed the data collected by TeDIS survey, which for over a decade has studied the evolution of Italian small and medium-sized enterprises. The results highlight two particularly significant issues: a) medium-sized companies have a clearer design strategy than in the past and there is a gradual convergence between innovation models based on technology and those based on aesthetics; b) the capacity to invest in a more structured design function enables companies to achieve positive results in terms of both growth and of income generation within global value chains.

Keywords:
Upgrading, Global Value Chain, Industrial Design, Industrial Districts, Small and Medium Firms, Italy

1. Introduction

The concept of upgrading plays an important role within the global value chain (GVC) theoretical framework (Gereffi et al. 2005). The globalization of supply chains and the presence in the market of low cost producers coming from emergent economies pose serious threats for business that based their competitive advantages on efficiency and manufacturing. This is particularly true for traditional and mature industries coming from western economies From this point of view, upgrading is crucial for coping with this new competitive scenario and for building a sustainable competitive advantage. Although the literature gathered important results in highlighting the economic impact of upgrading, little research has been done on how design is used as a strategic tool for product innovation within the firm (Ravasi and Lojacono 2005) and how it improves the capability of the firm to upgrade within global value chain. This paper aims at shedding light on the evolution of the role of design in the firm's strategy and value creation. We decide to focus our research on Small and Medium firms (SMEs) coming from Italian Industrial Districts. Only a limited attention (Bruce et al. 1999) has been paid to the role of design for innovation within SMEs which are not technology intensive and are specialized in mature industries.

Design has been considered a peculiar trait of the innovation model that the Italian companies put in place for competing in the global scenario (Bettiol and Micelli 2005). Especially in Fashion and Furniture industry Italian design stands out in terms of both aesthetics excellence and product quality. These important characteristics were the result of the specific organization of the district model that combines social relationships and economic ones. From this point, the design is the result of a distributed process that is rooted in the local culture and in tacit knowledge.

Although this process is still important for the competitiveness of the Italian industrial system, we argue that design and the way creativity is organized are changing within the context of industrial district. Design is rapidly evolving: it is not simply a new task that the company perform (i.e. marketing, production management, cost analysis), but is the result of a particular combination of entrepreneurship and a cultural project that transforms the relations between the firm and its customers. That transformation has a deep impact on product innovation process, on the management of communication and on the distribution channels

In the last decade, industrial clusters have experienced deep change (Sabel 2004). The main players in this development have been the SMEs, whose leading role in the clusters has ensured the international competitiveness of the Italian industry (Guelpa and Micelli 2007). These businesses have played a crucial role as interface between a territory that is still capable of providing examples of manufacturing excellence and the global markets that are increasingly hard to interpret and to

manage. The literature on this has highlighted that, compared to the traditional district firms, leading businesses today are characterised by increasing awareness of managerial issues and the rise of new forms of knowledge that bolster their competitive edge.

Among the many major aspects of this transformation, we would like to highlight the role of design: long considered as a non-explicit practice adopted internally by companies, it is now acknowledged as a structured function that contributes to product innovation. The aim of this paper is twofold: a) to study how design is evolving within leading firms and which are the implication of this changes in terms of knowledge creation and sharing, b) to analyse and investigate the relation between design and company's performance within global value chains.

To this end, the authors have assessed the data collected by TeDIS survey, which for over a decade has studied the evolution of Italian small and medium-sized enterprises. More specifically, we have attempted to identify the features that characterise the most effective ways of using design at a company level; we have also assessed the leading businesses' balance sheets to check whether there is a positive relationship between investing in design and performance for companies operating on international markets. The results highlight two particularly significant issues: a) medium-sized companies have a clearer design strategy than in the past and there is a gradual convergence between innovation models based on technology and those based on aesthetics; b) the capacity to invest in a more structured design and R&D functions enables companies to achieve positive results in terms of both growth and of income generation within global value chains.

In the first part of the paper we present the role of design in firm’s innovation also in relation to the ongoing international debate on this topic. This reflection will be followed by an overview of the development of Italian design vis-à-vis the new challenges prompted by globalisation. The second part of the paper presents the hypotheses that we made for testing if design has been adopted by firms for sustaining their upgrading strategy within global value chains. In this part we point out the methodology we used and the results we gathered. The conclusions will assess the main models used by medium-sized enterprises to organise and manage design.

2. Innovation and design: two variables that require reconsideration

Innovation and design have long been considered, both in theory and in practice, two hardly reconcilable notions. Understood as being a process whereby scientific and technological knowledge is created, managed and valued on the market (Malerba 2000), innovation is governed by clear rules and its purpose is to reconcile new discoveries (science) and the demands of mass production (market). The nature of its underlying strategies is typically Fordist: product standardisation and scale economies. Innovation is a linear process that aims at applying scientific

and technological discoveries to industrial manufacturing. From a theoretical point of view, the stress is on the technological content - and more specifically on investments for research and development - and the firm's ability to manage its intellectual property by using patenting tools.

Design, understood as an aesthetic exercise applied to design (Lojacono 2002), has taken a different road. The design component has placed its stakes on artistic skills as a means to enhance a product's aesthetic content; nevertheless, its main pursuit has been high levels of personalisation. Design in general, and Italian design more than others, has tended towards extremely differentiated products, almost unique pieces, targeting niches of sophisticated consumers. Designers are artists and their designs mirror their specific cultural ideas. The firm thus becomes an intermediary between artistic creativity and market demands (Alessi 2002). In certain aspects, it is far removed from the Fordist concepts of production: in design, one resorts to artisan skills to satisfy niches of demanding consumers.

It is therefore unsurprising that design found little legitimation in the literature on management and even less in that on innovation processes. It is apparently hard to reconcile technology and scale economies on the one hand, and aesthetics and niche production on the other.

This dichotomy between innovation and design is currently at the centre of an in-depth international debate, which has led to a broader understanding of the traditional concept of innovation: alongside technology, increasing importance is attached to softer and more *market-oriented* notions, such as the ability to interpret the consumers' demands, communication, product aesthetics, etc. (Arundel and Hollander 2005). Indeed, the technological and functional components of a product are not enough to ensure a sustainable competitive edge. Design is becoming an increasingly important feature for enhancing even high-tech products.

The reasons for this reconsideration of innovation and design are the result of a radical change in the world of consumption. In contrast to the isolated and passive attitude forced upon them in the mass production model, consumers now play an active role in generating value and in reshaping communication and meaning-generating processes (Di Maria and Finotto 2008; von Hippel 2002). Increasingly broader sections of the consumer world are turning their attention to the meanings carried by the product, rather than its technological performance alone. This does not mean that the quality of tangible components and product functions are less important: rather, it means that they are largely taken for granted. At least in more advanced societies, the consumers' needs and desires are becoming more and more complex (Fabris 2003). Consumers are seeking a “soul supplement” in products (Semprini 1996) and are asking the market to rekindle their senses and provide them with satisfying experiences associated to consumption processes. Today's market is profoundly different from that of the past, in which the consumer had a detached relationship with a strongly

standardised offer: today, the consumer wants to be more intensely and profoundly involved in the purchase of more and more differentiated products.

This transition is determined by the growing importance of the intangible and symbolic rather than the tangible nature of products. Products become "signs, symbols and communication" (Fabris 2003): consumers no longer buy out of need, but to communicate, express and define their own identity. The value of the experience side of the product is increasingly important: consumers ask to be part of memorable and unique experiences of consumption (Gilmore and Pine 1999). Businesses are called upon to create articulated and complex worlds, where consumption is the concrete expression of values, identity and culture. Consumers are led by the promise not just of an asset which is linked to a set of meanings driven by the brand and advertising, but of places, spaces and contexts, where the brand's *"virtual world"* – a narrative centred on the deeper values and meanings epitomised by the brand (Semprini 1996) - comes to life and in which the consumer plays an active role.

A significant number of the Italian industrial clusters' leading businesses have risen to this challenge arising from the consumers' world and have stood out for their ability to develop innovation processes by combining innovation and design. Dainese and Geox, for example, have built their international leadership thanks to a mix of technology and aesthetic quality of the product. This approach differs from the industrial district traditional innovation-based model and the larger industries' mass production model. The following paragraph will provide an overview of how design has evolved in Italy and its role in some leading businesses' innovation process.

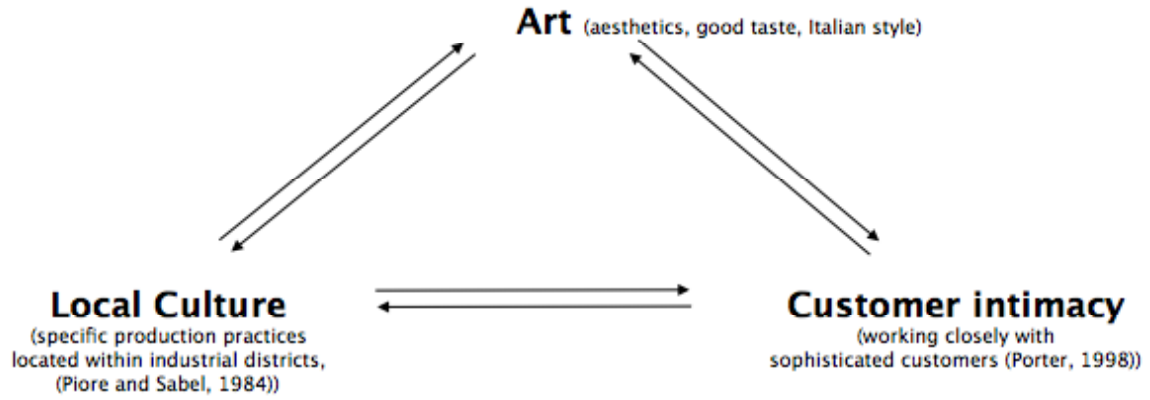
3. The evolution of Italian design

Design is a specific feature of the Italian industry's innovation model and is one of the elements that have ensured its competitiveness on international markets. Unlike the Anglo-saxon *industrial design* model, which is closely associated to a concept of engineering, Italian design has focused on the product's *aesthetic quality* (Lojacono 2002) as a characterising element. Although there is no shortage of examples of major Italian firms that have been successful in producing design objects for mass markets (Alessi, Artemide, Kartell), the "made in Italy" design mainly evolved in niche markets, basing its success on differentiated products and small scale production. Starting from the beauty of a product, our businesses have managed to intercept the consumers' growing need for 'meaning'. If mass production has determined the low cost of commodities, Italian design has gone in the opposite direction by attempting to confer an original meaning to the product, thus enhancing its cultural facet. From this point of view, design historians (De Fusco 2007) have interpreted this

trend as being the Italian answer to the uniformity of the market dictated by large scale manufacturing.

Industrial clusters have played a leading role in determining the success of Italian design both nationally and internationally. The networks of small and medium-sized enterprises have managed to draw added value from a very special mix of artisan skills (quality manufacturing) and aesthetics. This marriage between the entrepreneurial and the creative world is testified (Pambianco and Testoni 2008) by the alliances that have made Italian design famous worldwide (Garavani and Giammetti for Valentino, De Lucchi and Gismondi for Artemide, etc.). If, on the one hand, the cluster model has lent its flexibility and manufacturing skills to the designers, on the other, the designers have contributed by applying their creativity to generate an aesthetically beautiful product. This blend between manufacturing and creativity has turned design into a widespread trend in the Italian industrial system (Fig. 1).

Figure 1 The features of Italian Design



The scenario in which Italian design operates today has changed deeply. This change has been determined by two main elements. The first element is the new standing gained by design in the industrial production process. Far from being marginal, design has today been legitimately acknowledged in the world of mass production and has become a crucial part of the innovation process. Companies like Ikea, Samsung and Apple have driven design well beyond the luxury product niches and have turned it into something less exclusive. As a result, design makes its debut in the market of mass production, becoming a qualifying element of the innovation strategies of world class businesses. The consequences for our businesses are clear: the ability to interpret the aesthetic sensitivity of consumers is no longer an Italian prerogative only. The second element that

marks a clear break with the past is the internationalisation of production processes. New countries and territories have acquired the manufacturing skills that characterised the *made in Italy* clusters as a result of industrialisation processes driven by lower labour costs. The gradual drain of manufacturing activities has posed a problem from the point of view of the skills and the quality embodied by Italian design. In Italian small and medium-sized enterprises, the planning processes is rarely put on paper and is more often than not based on the interaction between the artist/designer and the industrial fabric. The industrial clusters have constituted a fertile ground for this type of interaction, facilitating the exchange of knowledge and smoothing the way for the product innovation process. The actual distance from the production process and interaction with businesses from different geographical areas where there is less product awareness and culture means that design has to become more explicit (Simonelli 1997; Zurlo 2000) and requires a more formal approach.

These two elements, i.e. the democratisation of design and the internationalisation of production, are major challenges for Italian design and for the competitiveness of industrial clusters. The leading businesses are those that were able to best interpret this novelty. More specifically, the extensive research that we have performed in recent years (Bettiol and Micelli 2005 and 2006) has enabled us to ascertain that innovation strategies have indeed been based on a new interpretation of the concept of design. From being a phase that was hardly reconcilable with management processes and broadly based on flair and individuality, design has now become a crucial part of the relationship that a firm establishes with its consumers. This relationship includes a range of activities, including product innovation, building and managing distribution networks, defining processes and the communication of contents. Aesthetics have not lost ground. Quite the opposite, they have become an identifying feature of Italian products. Nevertheless, today this trend must be enhanced in the framework of a suitable communication strategy. The ability to build a brand and prepare suitable distribution networks are two equally important stages for enhancing Italian design on the international stage.

4. Design and upgrading within global value chains: hypothesis to test

Within the literature on Global Value Chains, *upgrading* is a crucial concept for explaining competitiveness in the global markets. This concept refers to the capability of the firm to take advantage of the structure of the Global Value Chain and to specialize on activities with more added value (Gereffi et al. 2005; Porter 1985; Kogut 1985). Several scholars (Gereffi et al. 2005, Humphrey and Schmitz 2002) identified different typologies of upgrading:

- *Process upgrading*: the firm becomes more efficient in the management of the inputs through a better organization of the production system or through a superior technology;
- *Product upgrading*: the firm specializes in better products (usually high-end market);
- *Functional upgrading*: the firm acquires new functions to increase knowledge and skills and the quality of activities within the firm;
- *Inter-sectoral upgrading:* the firm applies effectively knowledge learnt within a specific industry into a new industry (cross-innovation).

From this point of view, *upgrading* means moving out from pure manufacturing processes and focusing on more *immaterial activities* such as marketing, branding, services, design and innovation in order to capture more value within the Global Value Chain. In particular, industrial design plays an important role in the upgrading strategy of the firm. Except for the *process upgrading*, where design could have indirect effects (a better design of a product could also improve the manufacturing process as happened in the Japanese automotive industry), in all the other three forms of upgrading design has an impact for sustaining the competitive advantage of the firm.

In the case of *product upgrading*, a better design could improve the intrinsic (functionality) as well as the extrinsic (aesthetics, meanings) quality of the product leading the firm to achieve a better positioning in the market and a *premium price*. For example, this happens for the luxury goods that are dedicated to the high-end of the market.

In the case of *functional upgrading*, design becomes a more structured function in order to improve the capability of the firm to compete at the global level. Especially in the past, design has been poorly structured within the management process of the firm and considered as an *artistic activity* that could be hardly coupled with the innovation strategy of the firm. At the international level, it is possible to observe a greater attention of the firm towards design and there are several examples of corporations, which invested heavily in design as an innovation process. Samsung was able to upgrade in the electronics global value chain from a subcontractor to one of the biggest brand in the industry integrating design as one of the key functions for producing innovative products in the market. Samsung opened several design centres within its organization and distributed them all over the world to study and design new products.

In the case of *inter-sectoral upgrading*, design is the means that the firm use to enter in a new (for the firm) market using knowledge acquired in a different industry. This is what happened in the sports-wear district in Italy, where firms specialized in the sky-boots design and production, started producing products for the ice and inline skating as well as motocross and snowboard.

Although design is widely recognized as one of the most relevant elements for sustaining an upgrading strategy, only a limited amount of research has been done to better understand the

contribution of design in upgrading in the Global Value Chains. With this paper we would to contribute to this line of research analysing the role of the design within Italian small and medium firms (SMEs) specialized in traditional industries (the so called *made in Italy*). We decided to focus on Italian SMEs because they - *ante litteram* - heavily invested in design to sustain the fierce competition of large corporations and emerging economies that especially in the traditional industries were able to acquire important positions in the markets. From this point of view, we would point out how design has evolved in the upgrading strategies that Italian SMEs adopted.

On the basis of the literature on upgrading we formulate *4 hypothesis* of research. We decided to focus on two typologies of upgrading - *product and functional upgrading* - that are considered most relevant variables in order to analyze the role of design. In addition, we decided to investigate the relevance of design within internationalization process both downstream (international markets) and upstream (global sourcing). The 4 hypothesis could be organized in two groups: the first one, composed of H1 and H2, concerns the role of the design in improving performances of Italians SMEs in the global markets in terms of both functional and process upgrading; the second one, composed of H3 and H4, concerns the role of design in the growing internationalization of production processes (beyond the traditional model of the industrial district) in terms of both product and functional upgrading.

Let's start with the first group of hypothesis.

H1. A high export ratio and higher performances of the firm than the average of the industry are related to a functional upgrading of the firm. In the perspective of the paper we identified several indicators in order to measure the role of design for the functional upgrading of the firm. In particular we pointed out four different indicators: the presence of a *design department* and or an R&D department, the relationship of the firm with external designers or free-lance (from now on network of designers), the incidence of design and or R&D employees on the total white collars of the company. These indicators emerged from an analysis of the specific literature on the role of design in product innovation and of the evolution of design within the Italian SMEs based on the observation of 10 years of surveys. We will discuss these indicators in detail in the paragraph number 6.

H2. A high export ratio and higher performances of the firm than the average of the industry are related to a product upgrading of the firm. We identified several indicators in order to measure the role of design for the product upgrading of the firm. We pointed out two main sets: a) the relevance of new designs or materials in the innovation process of the firm, b) he investment in brand strategies (trademarks, communication, national and international investment in distribution channels). These indicators were built on the basis of the literature (Hise et al. 1989; Hertenstein et

al. 2005) which identified this elements as important variables to understand the role of design in business performance.

The second group of hypothesis refers to an upgrading process related to the internationalization of production processes. As already discussed, we can expect that a company who has outsourced a good part of its production process within an international network of suppliers can focus its resources on value added activities, such as design, R&D, marketing, leading to a functional and product upgrading. The two hypotheses are:

H3. Higher performances of the firm than the average of the industry coupled with a) high rate of outsourcing of production and b) high rate of international production, are related to a functional upgrading.

H4. Higher performances of the firm than the average of the industry coupled with a) high rate of outsourcing of production and b) high rate of international production, are related to a product upgrading.

In the next paragraphs we present the methodology of the research and the features of the sample selected for the research. Eventually, we analyze the evolution of design within the innovation process of Italian SMEs. Then we test the hypothesis to verify the role of design in the upgrading of Italian SMEs.

5. Methodology: structural and strategic features of leading businesses

This research[1] involved 1003 companies belonging to the so-called "made in Italy" industries: fashion system (manufacturers of textiles, clothing, footwear, leather products, eyewear and jewellery, and tanneries), home and furniture cluster (furniture, tiles, glass), mechanical and plant engineering firms, food. 500 companies belong to the 45 most relevant industrial districts[2] and were selected from the population of companies with a turnover higher than 2.5 million Euros (1,818); 503 are non-Industrial District companies selected (random sample layered by industry) from the population of North Italy companies with a turnover higher than 5 million Euros (10,620). In this paper we will focus only on three industries, excluding food as the topic of the paper, and on the companies with a turnover higher than 5 million Euros; so we have a sample of 801 companies, 385 district firms and 416 not district firms, distributed as in Table 1.

[1] The data presented in the following paragraphs refer to a 2008 survey performed by Osservatorio TeDIS: it associated the qualitative assessment of company strategies to the assessment of the same businesses' economic and financial performance.

[2] The relevance of the industrial district derives from: a) the number of firms and the incidence of the district production (in terms of value and exports) on the Italian production (at industry level or, more often, referring to the specific specialization within the industry); b) the reputation the district has gained in the international markets through the companies (and their brands) located there.

Table 1 *Interviewed enterprises: distribution and profile*

Region	a.v.	%	Industry	a.v.	%
North East	284	35.5	Home furnishing	171	21.3
North West	295	36.8	Mechanics	408	50.9
Center and South	222	27.7	Fashion	222	27.7
Total	801	100.0	Total	801	100.0
Average turnover (ml euro)		49.2			
Median turnover 2007 (ml euro)		18.8			
Average employees 2007		130.5			
Median employees 2007		75.0			
Average Export		41.9%			

Source: TeDIS, 2008.

The interviewed companies mainly operate on end markets (48.3% declare that they mainly manufacture finished products for the market); a fair number of companies (30.5%) produces finished products for other companies. Their average turnover was 49.2 million Euros in 2007, with exports accounting, on average, for 41.9% of that figure. They employ, again on average, 130.5 direct employees. It is important to highlight that 43.3% of them belong to an industrial group. A considerable number of assessed enterprises (36.7% of the sample) have achieved a leading position, or in any case an important standing (53.4%) in the national and international competitive framework, by resorting to niche strategies and through their ability to personalise their product.

Production management is gradually not only crossing the boundaries of the local networks but also national borders. 35.5% of enterprises (32.7% in district firms, 38.0% in non district firms) is somehow involved in some form of internationalisation of production (at least one supplier or manufacturing plant located abroad) and this trend is more evident in the mechanical and fashion industries. More precisely, 25.5% of interviewed enterprises have at least one supplier abroad (34.2% if we consider only the companies that have an outsourcing strategy) and 18,8% of them are involved in direct foreign investment. It is interesting to see the different geographical distribution of the different forms of internationalisation. Strategic supply networks are mainly located in the European Union (60.9%), but about 30% of firms have consolidated manufacturing relationships in Eastern Europe and 46% in the Far East. Almost half of enterprises involved in FDI have a

manufacturing plant in West Europe (47.5%), followed by other Far East countries (31.2% of businesses).

As to the final markets, it has already been mentioned that these enterprises are very much inclined to export, exporting on average 41.9% of their turnover (only 9.1% of businesses only work on the Italian market), and are increasingly able to pull their weight in the targeted markets: indeed, some 63.8% of the interviewed companies have managed to develop at least partial forms of direct control over these markets by resorting to networks of qualified agents, commercial partners, franchising networks and direct points of sale. If we look at the list of main countries that companies export to, it is interesting to see that the traditional main export markets of the European Union (Germany and France at the forefront) and the United States are now firmly flanked by Russia and China, which import more and more luxury goods.

A remarkable number of companies combines the reorganisation of the value chain within an international context with a broader process of innovation that directly involves the product, in terms of research and development, design and communication (Tab. 2). 79.5% of interviewed companies declare that they have implemented product innovation in the last 3 years; 55.9% has invested in building proprietary brands to reinforce their image. As to what prompts the development of new products, it appears that innovation is increasingly *market driven* rather than *research-driven*: innovative processes are stimulated first of all by more or less formally structured market researches (37.2% of enterprises), followed by suggestions from customers (25.1%) and only then by internal research and development activities (10.5%).

Nevertheless, many enterprises declare that they have set up dedicated research and development facilities (60.7%), although only 31.8% has also registered patents. 34.4% of firms has established relationships with national or international research centres (but contacts are mainly, if not exclusively, with Italian Universities).

As to design, the topic that will be touched upon in greater depth in paragraph 6, 42.5% of enterprises (more than 60% in the home-furniture and fashion industries) consider it very important for ensuring the competitiveness of their product: 38.3% of companies have a clearly defined internal design function and figures rise to 60.8% in the furniture industry.

Finally, the last element supporting innovation in internal organisations and in relationships between companies is ICT (Information and Communication Technology), namely the tools available to manage and govern relationships with the value chain. The ongoing internationalisation processes seem to have given rise to a new phase in which companies are more clearly aware of the need to invest in network technologies. Nevertheless the adoption of such technologies lacks homogeneity and is more often than not a prerogative of a small section of more dynamic

enterprises that have recognised their crucial role as a tool to support new company strategies. There is still a clear distinction between e-mail and web sites, that are seen as a commodity, and other more complex tools. Amongst the latter, ERPs (Enterprise Resource Planning) are more broadly used (54.4%) unlike other same-type applications (Customer Relationship Management, Supply Chain Management, Sales Force Automation) that companies seem more reluctant to use Network technologies are more broadly employed in mechanical firms that often play a role in international automotive and domestic appliance production chains. Dominated by large multinationals, they are required to comply to field standards also from the point of view of technology. In the multi-faceted world of the products for the home and furniture there is a clear trend to broadly use ICT solutions. On the contrary, the fashion system seems to be less permeable than the other two sectors.

Table 2 *Innovation in Italian SMEs (% values)*

	Fashion	Home furnishing	Mechanics	Total
Internationalization of production	38.3	23.4	39.0	35.5
International commercial network	68.2	67.3	59.8	63.8
Product innovation	80.6	80.4	78.4	79.5
Trademarks	54.2	51.6	58.7	55.9
R&D structure	57.0	55.8	64.9	60.7
Design structure	60.8	45.4	23.0	38.3
Relationship with external designers	50,0	50,6	24,7	37,3
Patents	14.0	29.6	42.5	31.8
E-mail	99.1	98.8	98.7	98.8
Website	86.0	92.0	96.6	92.5
ERP	39.4	57.1	62.0	54.4
SCM	21.1	22.4	34.0	27.7
SFA	18.7	14.4	19.8	18.3
CRM	12.4	25.0	30.1	23.8

Source TeDIS, 2008.

6. Role and organisation of design in Italian SMEs

As we pointed out above, design emerged as one of the variables that Italian firms used to increase their competitiveness in the global markets. This strategy has been recognized in the literature as one of the features of the approach to innovation of the made in Italy.

Some data will now be provided in order to provide a clearer picture of the role of design and its specific features within Italian SMEs (the assessment specifically targets manufacturers of finished products, either for the end market or for other manufacturing companies – 631 companies out of 801). On average, 47.7% of these firms, i.e. almost one out of two, acknowledge that design is crucial for a product to be competitive. If we split this percentage in terms of firms that are based within industrial districts and firms that are based outside industrial districts, the results is quite

different. 63.6 % of the industrial district's firms declare that design plays a vital role for the competitiveness against just 33.3 % of the firms that are based outside industrial districts. This difference is relative to an historic approach to innovation based on design that characterizes Italian industrial districts. *Design-based* innovation is definitely more popular in fashion and in the interior design/furniture sector (74.4% and 67.1% respectively), whereas the mechanical sector uses design to a lesser extent as a driver for innovation (24.5%): this is quite understandable in an industrial industry that is more sensitive to technology (Tab. 3).

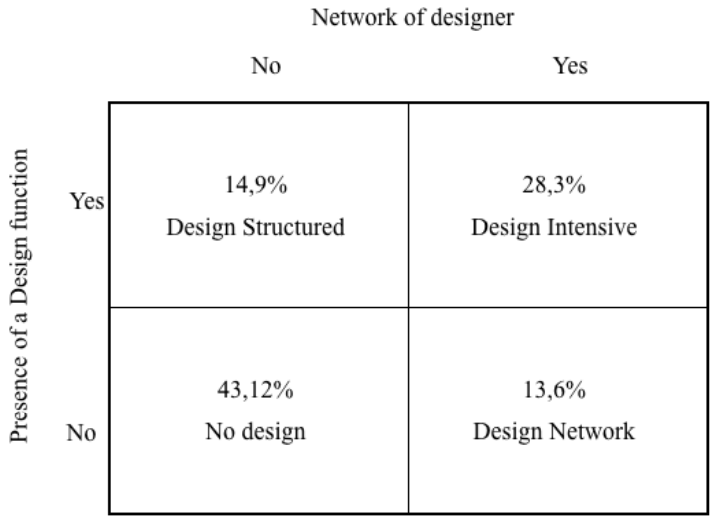
Table 3 *Importance of design in the 'made in Italy' firms (% values)*

	High	Low	Nothing	Total
Home furnishing	67.1	16.4	16.4	100.0
Mechanics	24.5	43.5	32	100.0
Fashion	74.4	14.6	11.5	100.0
Total	47.7	29.5	22.8	100.0

Source TeDIS, 2008.

In the past, Italian design generally based on outsourcing to a network of free-lance and independent designers. Especially for the home-furnishing that is at the base of Italia Design, The entrepreneur was used to sing a contract with a designer for a specific product or line of products. Although we had in the past on going collaboration between a firm and a specific designer (i.e. Achille Castiglioni for Flos, a famous lighting company), this collaboration was based on specific projects and managed through temporary contracts. The designer wanted to be independent in order to follow its artistic inspiration in terms of aesthetics and product design, the firm started a new project when it was necessary. Today, this scenario is changing. Italian SMEs tend to move towards a more careful management of the design process. This trend is confirmed by the research data (Fig. 2): 43.2% of Italian SMEs (that manufacture finished products) has decided to invest in a dedicated internal function for product design, while there is a 41.9% that invested in external and free-lance designers (indicated in the figure as network of designer). It is interesting to notice that there is an important number of firm – 28.3% - that at the same time have an internal design function and collaborate with external designers or design studios. We call this firms *design intensive* because they manage the design process combining internal as well as external designers. Among the firms that invested in design, the design intensive are the most numerous group. There are, of course, still firms that replicate the traditional design approach (Design Network) and amount to a 13.6%. There are as well firms – 14.9% - who decided to invest only in a structure function with no external collaborations.

Figure 2 *The Italian SMEs' management of design process*



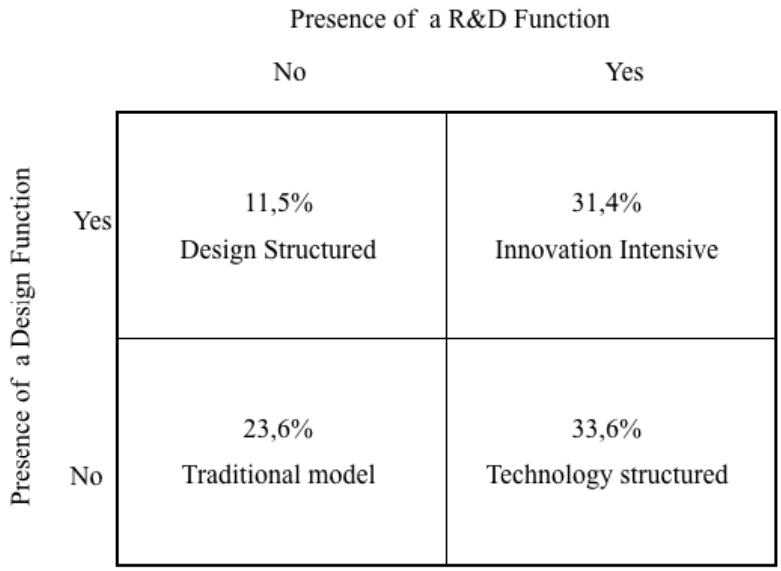
Source TeDIS, 2008.

If we break down the figures by industry, it emerges that the fashion industry is the most advanced in terms of its organisation of the design function and that this is the trend in more than two companies out of three (68.3%). Also home-furnishing give a lot of attention to carefully organising the design function with a relative significant percentage of companies (48.9%) having a dedicated a specific structure. The mechanical sector, as can be expected, is less sensitive to this issue: only 27.2% of firms have an organised internal design function.

Design-based innovation has often been chosen by Italian firms instead of research and development and investments in new technologies. The fact that our industrial networks specialise in mature and low-tech sectors has undoubtedly contributed to this trend. Nevertheless, the research confirms a gradually changing attitude in firm, that today appear to be more interested in more closely combining the product's aesthetic variables (design) and its technological contents (R&D). By associating the investment made in design facilities and that made in facilities dedicated to research and development, it is possible to identify four different approaches to product innovation in Italian SMEs (Fig. 3). 31.4% of enterprises that manufacture finished products have both an internal research and development department and a design department; these are what we have

called the *innovation-intensive* businesses. This group of enterprises have set out on a complex innovation path which attempts to combine technology and design. On the other hand, 11.5% of enterprises have adopted a *design-structured* strategy and have strongly driven the aesthetic component as an element that determines their competitive edge; at least for the time being, they have decided not to invest explicitly in research and development. 33.6% of businesses can be placed in what has been called the group of *technology-structured* enterprises that consider technology as the variable that best qualifies their innovation model. Finally, 23.6% of enterprises, which are part of what we have called the *traditional model,* do not declare any structural form of investment, be it in technology or in design. Despite not performing any structural investments, half of the enterprises in the latter group still declares that they do product innovation. It is basically an innovation model that is strongly founded on the charismatic figure of a businessman; it resorts to outsourced skills (designers, engineers) that, in the past, were the main feature of the Italian SMEs' innovation processes.

Figure 3 *The Italian SMEs' innovation models*



Source TeDIS, 2008.

What emerges is that today 76.4% of Italian SMEs that manufacture finished products has a structured or partly structured innovation strategy while 23.6% has not yet invested in this area.

The recourse to one of these four innovation models is strongly influenced by the field of industry in which enterprises operate (Tab. 5). Fashion has the highest number of *innovation-oriented* enterprises (42.3%), followed by home-furnishing (37.6%). These results are not that obvious: in fact, both these sectors were long considered to be scarcely aware of technological contents and

more inclined to innovate in aesthetics. However, our data stress that the firms have a more mature attitude towards research and development, without relinquishing design. Quite the opposite: the data highlight an interest for more careful and aware forms of investment when product aesthetics are involved. It is clear that in the home-furniture sector and in fashion any innovation that only targets technology will be rather unrewarding. Only 16.6% of fashion businesses and 23.4% of furniture manufacturers have a technology-structured strategy: these companies mainly work in a production chain structure and are specialised in manufacturing (yarns, weaving, tanning, furniture panels) in large amounts. In the mechanical sector, the situation is almost opposite to that of the fashion and the home-furniture industries. Here, technology evidently has a primary role: 47.2% of enterprises are *technology-structured*. Nevertheless, even in the mechanical sector the design component has started to become more and more important: in 22.8% of businesses, investments in research and development are flanked by special attention to the aesthetics of the product.

From this viewpoint, we are witnessing a gradual convergence between the world of technology and the world of design. In the traditionally more aesthetics-driven sectors, research and development is beginning to be a major feature in the innovation process. On the other hand, in the technological sectors, design is no longer a marginal issue but is starting to take on a more significant, albeit still minor role.

Table 4 *The Italian SMEs' innovation models per industry (% values)*

	Home furnishing	Mechanics	Fashion
Innovation Intensive	37.6	22.8	42.3
Design Structured	11.3	3.9	25.8
Technology Structured	23.4	47.2	16.6
Traditional Model	27.7	26.1	15.3
Total	100.0	100.0	100.0

Source TeDIS, 2008.

The four approaches to innovation that have just been described are useful to understand how enterprises behave today in terms of both strategy/competitiveness. The leading businesses among Italian SMEs, i.e. those that have been better at facing the challenges of globalisation, have put their stakes on a combination of factors to support their competitiveness: investments in ICT, the ability to pull their weight in international supplier networks while ensuring a position in the end markets, investments in technology and in communication. For each of these items, we have identified a

number of summary indicators[3] to be assessed vis-à-vis innovation strategies (Tab. 6). The *innovation-intensive* enterprises were able to invest more extensively in the identified indicators; in fact, these are enterprises that combine an intensive recourse to new technologies and high quality in the research and development process; they are strongly inclined to internationalise both in the areas of manufacturing and supply and definitely pull their weight in terms of communication. Compared to those that use different innovation models, these enterprises record higher values for all these indicators. Basically speaking, design is not just a marginal stage in the broader innovation process: it has become a crucial part of a strategic model that has proved its worth on the international markets.

Purely *design-structured* enterprises tend to be proficient in the area of communication and pull their weight on the international markets; however, as is to be expected, they are limited from a technological viewpoint. The use of network technologies and patents is definitely smaller compared to *innovation-intensive* enterprises. The enterprises belonging to what has been called the *technology-structured* group, on the contrary, has a clear strategy for technology issues and seems to perform well in the areas of communication and have a strong presence on international markets. Those who seem to be left behind are the enterprises that follow the *traditional model*: except for ICTs, they have recorded are lower than those achieved with any other model for all the examined variables.

Table 5 *The Italian SMEs' innovation models and strategic variables (% values)*

	ERP	Groupware	CRM	Distribution at international level	Global sourcing	Patents	Trademarks
Innovation Intensive	67.4	45	30.4	78.5	45.3	41.1	74.6
Design Structured	33.3	21.9	15.9	72.5	30	11.4	58
Technology Structured	65.1	43.0	26.6	69.8	46.8	49.5	68.5
Traditional Model	46.3	39.7	20.4	50.3	27.8	19.7	42.7

Source TeDIS, 2008.

[3] ERP, Groupware and CRM for new technologies; a commercial network to assess the weight on the end market; presence of investments in manufacturing abroad and foreign sub-suppliers for the internationalisation of manufacturing; technology patents; investment in proprietary brands for communication

7. Research results: test of hypotheses

The objective of this paragraph is to specifically test the four hypotheses we've done in paragraph 4. The hypotheses have been tested only on the 631 companies that produce finished products for the end market or other companies.

The first two hypotheses concern the functional and product upgrading related with a strong and competitive presence of the firm on international markets (we call it "downstream upgrading"). To test those hypotheses, companies have been divided in two groups: 1) the companies that in 2007 had an export ratio higher than 50% of the total turnover and higher performances with respect to the average of the sector in terms of turnover growth and profitability (we call them "winners")[4]; 2) the other companies. The first group is composed by 63 companies; the second one by 405 companies; the other cases are missing for different reasons (absence of balance sheet and/or answer to the question concerning the export ratio). Results are showed in Table 6:

Table 6 *Test of H1 and H2: downstream upgrading (a)*

	Winners with export higher than 50% of turnover	Other companies	p	
H1 - Functional upgrading				
Design department (% on tot. companies)	54.8	41.0	0.041	*
Design network (% on tot. companies)	50.0	57.0	0.311	
Design employees on total white collars (a.v.)	0.09	0.09	0.862	
R&D department (% on tot. companies)	75.8	62.2	0.038	*
R&D employees on total white collars (a.v.)	0.15	0.11	0.253	
H2 - Product upgrading				
Product innovation in design (% on tot. companies)	54.1	50.8	0.632	
Product innovation in materials (% on tot. companies)	52.5	56.9	0.523	
Registered trademarks (% on tot. companies)	80.3	59.1	0.002	**
Marketing communication on registered marks (% on tot. companies)	75.5	79.1	0.573	
International commercial network (a.v.) (b)	0.26	0.20	0.038	*
National commercial network (a.v.) (b)	0.27	0.23	0.188	

(a) Differences are compared through Chi-square test (percentages) or T-test (absolute values).

(b) The commercial network is an indicator (range 0-1) made by a weighted composition of different solutions: sales agents, assistance points, franchising networks, company's point of sales, commercial associated companies.

(c) ** means that differences are significant with α=0.01; * means that differences are significant with α=0.05

[4] More precisely this indicator of performance is the combination of the results achieved by enterprises in terms of profitability (the average gross operating margin over the turnover entered for the period) and growth (the cumulative increase in turnover in the period) in the period 2004-2007 (balance sheets data). The median values of these indicators were taken for each sector and compared with results generated by each single enterprise. Winners recorded a performance well above the median for both indicators.

The table shows only four differences among the two groups of companies statistical significant (we used Chi square and T-test to evaluate differences): the more competitive companies show an higher frequency of design department and R&D department, on the functional upgrading side, and an higher frequency of registered trademarks and a better quality of the international commercial network on the product upgrading side. This means that H1 is confirmed, so as we can say that the capacity to be competitive on international markets (that means to have an high export ratio combined with a good financial performance) is positively correlated to the upgrading of internal activities, namely investments in design and R&D functions. The *quality* of this functional upgrading is more important than the *quantity* as the number of the people involved in those functions seems less important. As far as H2 is concerned, it is only partially confirmed. Product upgrading in terms of product innovation in design or new materials are not related to the competitiveness of the firm; this is not very surprising in the case of Italian companies as they have traditionally invested in product innovation, even if in informal and not well structured ways, as discussed in previous paragraphs, so as the attention given to the quality and the aesthetics of the product does not represent itself a new course in the innovation strategy. More interesting is the enrichment of product value due to marketing efforts, namely the registration of trademarks and the creation of an international commercial network. Communication and management of distribution channels are becoming key elements in the creation of product value perceived by consumers; these results witness that a good and sophisticated product can be appreciate in the market only within an appropriate communication and distribution framework.

The last two hypotheses refer to an upgrading process related to the internationalization of production processes. To test the hypothesis, companies have been divided in two groups: 1) companies with higher performances than the average of the sector (winners), with an outsourcing ratio (in terms of value) higher than 30% of the company total turnover, and with suppliers located abroad (percentage of foreign suppliers higher than 0)[5] (23 firms); 2) other companies (494 firms)[6].

[5] Both percentages correspond to the last quarter of the two distributions.

[6] The other cases are missing for different reasons (absence of balance sheet and/or answer to the question concerning outsourcing ratio or foreign suppliers).

Table 7 *Test of H3 and H4: upstream upgrading (a)*

	Winners with outsourcing higher than 30% of turnover and foreign suppliers	Other companies	p	
Functional upgrading				
Design department (% on tot. companies)	69.6	41.3	0.007	**
Design network (% on tot. companies)	69.6	41.5	0.008	**
Design employees on total white collars (a.v.)	0.07	0.09	0.701	
R&D department (% on tot. companies)	95.7	62.2	0.001	**
R&D employees on total white collars (a.v.)	0.22	0.11	0.036	*
Product upgrading				
Product innovation in design (% on tot. companies)	65.2	49.9	0.152	
Product innovation in materials (% on tot. companies)	73.9	55.4	0.810	
Registered trademarks (% on tot. companies)	87.0	61.1	0.012	*
Marketing communication on registered trademarks (% on tot. companies)	89.5	77.4	0.218	
International commercial network (a.v.) (b)	0.33	0.21	0.005	**
National commercial network (a.v.) (b)	0.37	0.24	0.002	**

(a) Differences are compared through Chi-square test (percentages) or T-test (absolute values).

(b) The commercial network is an indicator (range 0-1) made by a weighted composition of different solutions: sales agents, assistance points, franchising networks, company's point of sales, commercial associated companies.

(c) ** means that differences are significant with α=0.01; * means that differences are significant with α=0.05

The table shows few differences among the two groups of companies statistical significant (we used Chi square and T-test to evaluate differences): on the functional upgrading side, the more competitive and outsourcing companies show an higher frequency of design department, design network and R&D department; moreover they have an higher ratio of R&D employees on total company's with collars. On the product upgrading side, they have a higher frequency of registered

trademarks and a better quality of both the international and national commercial network. Those results confirm H3, while H4 is only partially confirmed. Companies that are part of a global supply chain and gained a good competitive position show a clear functional upgrading, as they have a more structured presence of design and R&D compared to other companies. The product upgrading is not verified in terms of product innovation made by new design or new materials; however the most competitive companies have increased the value of their product through marketing activities, such as registered marks and a better distribution process, at national and international level.

8. Conclusions and further research

Design has been considered an important element in the upgrading strategies of the firms within Global Value Chains. Nevertheless, little research has been done to verify, on systematic basis, the relevance of design for competitiveness and innovation. Although limited and focused only on Italian SMEs, our research represents a contribution in the demonstration of the relevant role played by design in upgrading. The results we gathered confirm that a relative higher export ratio and performance of the firm (than the average of the industry) is positively related to a functional upgrading, realized through an internal identification of a design and innovation department. In the design field, where temporary collaboration and free-lance contracts are the rule for managing creative people, the investment on an internal design structure means the necessity for the firm to better manage the creative process related to design and to better integrate it into business processes. The *quality* of this functional upgrading is more important than the *quantity*. The number of the people involved in the design and innovation department is not clearly correlated to a better performance in terms of export and financial outcomes. From this point of view, the design and innovation function is used as an interface between the world of creativity and the world of business and production processes. As we pointed out in section 6 of this paper, the investments in a design department do not imply a decrease in external and temporary collaboration. Often, firms with internal departments continue to have external collaborations with free-lance designers although mediated through the design department itself. The access to external creativity is an important asset for product design and the internal department, mainly composed by designers and creative people, has to put together creativity and business perspectives.

The results we gathered on the export side are consistent with those related to the internationalization of the supply chains. In particular, we found that the firms who have more outsourced their production activities at the international level, invested, more than the other companies, in internal design and innovation departments. In the case of Italian SMEs this was not an obvious result as it could be for multinational corporations, which focus their strategy on core-

activities. As we pointed out in section 3 of the paper, manufacturing still plays a role in the design process of traditional products and sometimes it is hard to isolate design from the production activities, although they are different functions. From this point of view, we argue that so far Italian firms where able to improve the codification of craftsman and production practices in order not to lose strategic tacit knowledge with the relocation of the manufacturing activities. We point out that still this knowledge play a crucial role in the design of the product even if the firm outsources the production processes.

In terms of *product upgrading*, on the basis of our research, there is not a clear link between the introduction of a new design and/or material in the product and a better export ratio and business performance. On the contrary, there is a positive correlation between performance and export (and outsourcing on the other side) and a broad set of *marketing activities* (communication, branding, trademarks, commercial network, etc.). This could sound counterintuitive in terms of design. In our opinion, this is line with what it is happening in terms of design practice at the international level. As several emblematic case studies pointed out (Apple, Ikea, Prada, Gucci, etc.), the product is becoming one of the variables of the design process that is now extending its influence to communication and distribution channels. An exclusive and aesthetically sophisticated product can hardly stand out in the market without an appropriate communication campaign and carefully designed store. The experience of the customer who buys a Gucci purse in a Gucci shop is dramatically different from a consumer who buys a counterfeited (and sometimes hard to distinguish from the original) Gucci purse on local markets (or on the streets). Design is moving towards the definition of the complete experience of consumption than just limiting to the product itself. In addition, for what concerns specifically Italian SMEs, firms has been investing in design for a long time, starting in the mid-sixties. Therefore the attention given to the quality and the aesthetics of the product has a long tradition and it is quite distributed within Italian firms and does not represent itself a different path in the innovation strategy. On the contrary, the lack of Italian SMEs is related to qualify their presence in the market through a better managed marketing strategy and operations. The challenge for Italian SMEs is to integrate design with marketing process in order to increase their positioning in the global markets.

We acknowledge the limits of our research that is mainly explorative. We are aware of the fact that is based on just Italian SMEs and need more robust statistical analysis and an in depth investigation on industry influence. In addition, we know hat the indicators we selected for the analysis are only partially used in the literature on GVC and design management. Design is not yet a well-established research field in the literature and advancement in the research could be helpful to improve our

research. Also, we have to deepen our analysis and to start a more broad comparison with SMEs coming from Europe and US in order to better understand the relevance of our results.

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