

New Product Development in the Fashion Industry: An Empirical Investigation of Italian Firms

Regular Paper

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Abstract This paper investigates how companies in the fashion industry organize, plan and perform their New Product Development process (NPD). The results have been achieved through an empirical study carried out by the authors with the support of the GeCo Observatory, an Italian research initiative launched in 2012. This paper shows the details of eight selected case studies from the Italian fashion industry.

Keywords New Product Development, Fashion Industry, Empirical Research

1. Introduction

The fashion market is characterized by rapid changes, where cases of success and failure can often be linked to organizational flexibility. These markets exhibit typical characteristics: short lifecycles, high volatility, low predictability and high impulse purchasing [1]. According to [2], it is possible to classify fashion markets according to price and competitive strategies using a

pyramid of 5 market segments: *Couture*, *Prêt-à-porter*, *Diffusion*, *Bridge* and *Mass*. These segments can be described as follows [2]:

- *Couture* (at the top of the pyramid) represents luxury global brands and their need to communicate product quality and value.
- *Prêt-à-porter* brands focus on seasonal products, creativity and high prices. The main Critical Success Factors (CSFs) are product innovation, quality and brand image. This market segment includes luxury brands not dependent on fashion that offer more classic products and carry-over.
- *Diffusion* includes industrial brands with the same CSFs as the previous segment.
- *Bridge* regards products that bridge between *Mass* and *Diffusion*: the CSFs are linked to the ability for serving the market at the right time. Service level is more important than style.
- *Mass* is the bottom of the pyramid as the least customized market: big volumes and distribution capillarity are the most important characteristics.

In Italy, the fashion industry is the second manufacturing sector after mechanics in terms of production volumes and export amounts. With a positive variation of 12.1% in 2011, it represents approximately 17.5% of the Italian manufacturing sector and accounts for 14.5% of total exports. Fashion is an industry with one of the highest propensities towards foreign markets and it is the main ambassador of the *Made in Italy* label around the world.

Despite this success, in the literature, only a few studies have investigated how Italian fashion companies introduce new products and new collections into the marketplace. For this reason, the authors focus their attention on this industry and in particular on the way these companies generate new products. The paper is organized as follows: Section 2 presents a brief review of the New Product Development (NPD) process in the fashion industry, then Section 3 introduces the research questions, Section 4 presents the research methodology followed and Section 5 presents the data. Finally, Section 6 highlights the main findings and concludes the paper.

2. The NPD Process in the Fashion Industry

In the fashion industry, NPD is a dynamic process characterized by a high seasonal demand, which depends on the seasonal nature of fashion products. The entire NPD process runs at least two times per year, one time for each season and with short Time-To-Market (i.e., 15 months in the apparel industry, 12 months in the leather industry). Several product revisions occur, with continuous interactions among designers, stylists and marketing functions [3]. Often during a single season, revisions and modifications are still happening when the final product is already on the shelves; this occurs to make some re-arrangements and re-alignments in accordance with customer demand (e.g., change of colours for a model in the apparel sector).

In this context, as is described in the literature, NPD is a comprehensive process [4][5], which starts from

- (i) design,
- (ii) modelling/prototyping (to realize the demonstration products to be shown at the fashion fairs),
- (iii) detailed engineering,
- (iv) material sourcing and then ends with
- (v) production and distribution.

The production phase usually lasts 3-4 months and starts when material sourcing is completed. The sourcing phase is very particular: its duration can change from 2 weeks up to two and a half months, depending on the duration of the commercial launch, which generally takes place at the same time, in conjunction with the fashion shows and fairs (e.g., the Pitti Florence fair, Milan and Paris fashion weeks, etc.). At the beginning of the sourcing phase, a

provisional and generic order of raw material is submitted to the suppliers, while confirmation of the raw material quantity is given at the end of this phase, with a maximum gap of 20-30% from the provisional phase. During this very short period, as soon as the number of sold units is known for the current season, the company board has to decide which products will be produced and which not; accordingly, the raw material to order needs to be defined.

During this period, most companies also have to finish the engineering phase: for example, in most cases, generation of the final Bill of Material (BOM) takes place when orders have already been launched. Once the company's decision is made, the creations of the BOM and the raw material purchase order have to be submitted quickly. Moreover, the decision of what has to be produced can change very rapidly during the period when fashion shows take place (i.e., the appearance of a Hollywood star with a particular bag can completely change the provisional regarding the sold units of that product and this can sometimes happen on the last day of the last fashion fair!). In some companies, the engineering phase is completed for all the products before the beginning of the fashion fairs, permitting quick management of the sourcing activities, but overloading the engineering staff with activities that probably will not be valued, since the real produced goods are usually only a small percentage of all the items presented at the fashion shows.

3. Research Questions

The objective of the paper is to carry out exploratory research in the Italian fashion industry in order to analyse how the NPD process is executed. In particular, for clarity of understanding, the NPD process has been analysed in three main perspectives: business organization, process management and knowledge management. The first perspective (*organization*) concerns the analysis of the behaviour of a company's daily NPD activities, the second one (*process*) investigates how NPD is performed and the third one (*knowledge management*) focuses on the dynamics related to the creation, sharing, representation and re-use of tacit and explicit knowledge in the NPD process.

This paper aims to investigate existing literature gaps by answering the following research questions:

- (i) What are the Critical Success Factors (CSFs) in the Italian fashion industry? The term 'critical success factors' considers all product design related activities and elements that allow a company to be competitive in a specific market segment [6].
- (ii) How are firms managing their NPD process? Increasing global competition and pressure, which requires improved product quality and innovation,

reduce product costs and time-to-market, while rapidly responding to changing customer needs forces companies to stress NPD more and more. How can these general aspects be applied to the fashion industry?

4. Methodology

Many different methods can be applied in the development of new tools and methods for the NPD process, including surveys, case studies, action research, modelling and simulation [6][7][8][9].

Because of the research questions defined above, the nature of the study is both exploratory and explanatory. In fact, the following part of the paper not only describes the NPD process of the Italian fashion industry, but also possible correlations among critical success factors along with other dimensions (process, organization and knowledge management).

The chosen methodology is multiple case studies, which involved a sample of 8 companies belonging to different fashion segments, from *Bridge* to *Pret-à-porter*. According to [10], the number of 8 cases can be considered sufficient for hypothesizing some evidence from the research.

The sample is composed of companies from the upper and medium level of the pyramid defined by [2]. All the companies produce seasonal products with a low percentage (less than 30%) of carryover. This means that all of these companies have to run their NPD process at least twice a year for 70% of their items.

Most of the companies included in the sample produce and distribute their products worldwide, using both retail and wholesale channels. Only one company produces for other brands. The reason for including both brand owners and manufacturers was related to the need for identifying some differences between how NPD is managed within these two groups.

The sample is equally composed of big companies (50%) and small and medium enterprises. The reason for this choice is related to the characteristics of the Italian

fashion industry, which is composed of both small and big companies competing in the same market segment [11].

The prime source of data in this multiple case study was a single, semi-structured interview with a key informant, usually the CIO, selected with the aim of providing a comprehensive picture of the actual situation. The interview was first conducted with open-ended questions and then with more specific and detailed questions as the interview progressed. Data was also collected from unstructured interviews and direct observations.

5. Findings

The sample of 8 Italian fashion firms was analysed in order to identify the main pursued critical success factors and to assess how these companies manage their NPD process. As previously stated, for clarity of analysis and in order to easily compare the gathered information on how NPD is managed, the data has been organized into three main areas: *organization*, *process* and *knowledge management* [12][13]. Further details on criticalities, problems and main areas of interventions have also been analysed. The following sections answer our research objectives as based on these main categorizations.

5.1 Critical Success Factors (CSF)

Table 2 shows the CSF of the interviewed companies and the strategic market position defined by the companies. The CSF represent the characteristics of the products produced by the companies that influences the customer in the choice of the item to buy. Initial evidence of the research shows that all the companies declared to pursue the competitive factor of quality. This result concurs with those reported by other studies of the fashion industry (e.g., [14][15][16]). Most of the companies are leaders in their niche markets and consider customer service as a relevant competitive factor. The elements of timeliness, costs and innovation are other important factors. In particular, timeliness is mandatory, due to the fashion market constraints, in which products have to be on the shelves at the beginning of each season.

ID	Main Product Line	Classification	Employees	Income (M€)
A	Apparel	Diffusion	260	45
B	Apparel	Diffusion	5.000	1.300
C	Accessories	Diffusion	35	12
D	Apparel	Couture	900	100
E	Apparel footwear	Bridge	350	286
F	Apparel active ware	Pret-à-porter	200	100
G	Accessories footwear	Pret-à-porter	250	150
H	Apparel accessories	Diffusion	2.200	1.006

Table 1. Sample classification

ID	Strategic position	Competitive factors	Levers for Success
A	Follower	Quality, Timeliness	1) Strategic suppliers 2) Distribution channel 3) Value-added for the customer
B	Market Leader	Quality, Innovation	1) Value-added for the customer 2) Distribution channel 3) Key resources
C	Follower	Quality, Innovation	1) Key resources 2) Strategic suppliers 3) Value-added for the customer
D	Niche leader	Quality, Customer Service	1) Value-added for the customer 2) Strategic suppliers 3) Distribution channel
E	Niche leader	Innovation, Quality, Customer Service	1) Value-added for the customer 2) Distribution channel 3) Strategic suppliers
F	Follower	Costs, Quality, Timeliness	1) Strategic suppliers 2) Distribution channel 3) Key resources
G	Niche leader	Customer Service, Quality, Innovation	1) Value-added for the customer 2) Distribution channel 3) Strategic suppliers
H	Market Leader	Quality, Costs	1) Distribution channel

Table 2. Critical success factors of the companies interviewed.

In terms of levers for the success of the companies, an important role in the fashion NPD process is represented by the suppliers, which are considered strategic by all of the companies. This is likely due to the fact that, even if the NPD process is not outsourced by most of the companies, the totality of the production, both of the sample and of the final product, is outsourced and often offshored to Far Eastern countries. Other levers are the distribution channels, the value-added for the customer and other key resources (e.g., production facilities).

Most of the fashion companies design different product solutions such as catalogues twice a year, receiving requests and specifications from their marketing departments. Companies' catalogues are then presented during the fashions shows when orders are collected. These must be produced rapidly and then distributed globally.

5.2 NPD Organization

The *organization* perspective includes aspects related to work organization, flexibility and coordination. Generally, the entire NPD design process is internally performed or sometimes executed by external actors geographically located next to the main company. Designers have a lot of freedom; they can experiment with more alternatives and can manage their tasks with significant flexibility, especially in the first phases of the NPD process, which is entirely left to the so-called *style* department. This aspect, which is more evident in those

companies belonging to the higher part of the pyramid as defined by [2], is linked to the long TTM period (from 12 to 18 months). In the first part of the NPD process, especially for luxury products, the style department has a predominant role. Stylists and designers spent most of their time discovering and selecting new materials, new trends and new solutions. There isn't a real formalization of the tasks at this time, mostly because of the fact that the responsibility of the failure or the success of the final product is related to the capability of these actors to predict the tendencies and trends of the fashion markets.

In most of the companies, experienced designers are involved from the earliest stages of a project, with a focus on reducing overall uncertainty and mitigating potential risks of project failures.

5.3 NPD Process Management

The fashion NPD process is well defined and standardized in some main activities. All the interviewed companies have a similar NPD process, which generally starts with the study of the first concept, done by the *bureau du style* office. This activity begins usually two years before product production and its goal is to define product materials, fibres and colours. These offices define the documents (*cahier du style* o *cahier de tendance*) used in all the NPD phases. The output of this first activity inspires the product's design. Later, the style department identifies which products have to be realized in the following collection and defines the due date of each product. Then,

the prototyping phase begins, internally and/or externally to the company, for testing materials and ideas. When the prototypes are completed, a technical reference document is elaborated and a reference code is generally assigned to the product. This code can be provisional or final, as set by the company's rules. The technical document contains information regarding raw materials and accessories both for the product and the package, product variants, as well as some information regarding the production process. After the prototyping phase, the engineering phase begins: drawings are digitalized with the use of CAD tools specific for this industry and the sampling phase follows. In this phase, modifications to the drawings can be done up to the last moment, before sending the samples to the planned fashion shows and fairs.

Based on this general model, the interviewed companies present some peculiarities that should be discussed. For example, Company A produces 100% seasonable products without any formal NPD model or any written

procedures. However, the NPD process is not completely casual or out of control; rather, an informal procedure exists and is followed. The absence of a formal "written" NPD process is very typical in these companies. Another example is Company D, in which the NPD process consists of a series of standard activities that have been consolidated for several years, performed and managed by skilled and experienced designers.

For most of the companies, the development process is strongly collaborative. Tasks and activities are often done in parallel (*Concurrent Engineering*) by multidisciplinary and multifunctional teams. People involved in different functions contribute their know-how and collaborate from the first stages of the development process.

On average, half of the tasks performed from one project to another are innovative: fashion companies are forced to be innovative in their design.

ID	NPD model	Nature of Development Process	Innovative vs. routine tasks
A	Informal NPD model	Collaborative	40%
B	Informal NPD model	Concurrent Engineering	80%
C	Formal NPD model	Concurrent Engineering	70%
D	Informal NPD model	Sequential Process	20%
E	Formal NPD model	Concurrent Engineering	50%
F	Informal NPD model	Collaborative	80%
G	Informal NPD model	Collaborative	60%
H	Informal NPD model	Concurrent Engineering	40%

Table 3. NPD process characteristics in the fashion industry

ID	Project Launch	Project flow	KPIs
A	Regular, minimal delay	Significant reviews along the project impact on cost and time	No KPIs
B	Regular, minimal delay	High efforts at the beginning to avoid further changes	Set of KPIs
C	Regular, several modifications, respect of timeline	Initial study and brainstorming, some revisions can occur before choosing the final solution	Time and cost
D	Regular, minimal delay	Structured project plan, some modifications can occur (cost impact), all data are tracked in IT system	Set of KPIs
E	Regular, minimal delay	Significant reviews along the project impact on cost and time	Time and cost
F	Regular, delay is frequent	Structured project plan, important role played by the <i>maison</i> , modifications can occur with negative impact on time	Time and cost
G	Regular, delay is frequent	Significant project reviews impact on cost and time	Time and cost
H	Regular, delay is frequent	Significant project reviews impact on cost and time	No KPIs

Table 4. Set of KPIs implemented in fashion NPD process

Regarding the Key Performance Indicators (KPIs) for the NPD process, the most used are time and cost indicators. Generally, NPD projects start at a regular interval and according to an available plan, which considers the different types of projects (e.g., changes, radical redesign, innovation, etc.). These activities often require reviews and delays are common. Projects are subjected to continuous review in order to meet the requests of different actors (e.g., marketing, customers, suppliers, etc.). Changes often have significant impacts on development time and cost.

A complete report of the results is reported below in Table 4.

5.4 NPD Knowledge Management

Everyday knowledge is created, shared, retrieved and displayed; the better this knowledge is stored, represented, captured and reused, the more efficient the NPD process will be. This is especially important in the fashion industry, where the NPD process runs at least twice a year in order to develop new collections, composed of totally new products.

In order to preserve and catalogue knowledge, data and information should be formalized and represented in a way understandable by each practitioner inside the company and should be easy to be re-used. Generally, the higher the level of computerization of NPD, the faster and more precise the knowledge management process and the communication between people and departments are. In order to achieve these results, PLM (Product Lifecycle Management)/PDM (Product Data Management) software are suitable for implementation.

In terms of companies implementing a Knowledge Management approach, most cases have some formal initiatives in place (Table 5), such as lesson learned practices, specification documents, checklists, visual management boards, as well as some software solutions such as network shared folders, intranet/wiki portals and PDM/PLM platforms. The main sources of knowledge are previous projects, personal experience, personal intuition, as well as collaboration with colleagues.

5.5 Problems and Criticalities in NPD

Regarding the problems that occur in the NPD process, a pre-defined set of the most frequent criticalities has been presented to the companies. Table 6 shows the results of these interviews. The most frequently recurring problems concern costs prediction, followed by the reworks of the designers due to change requests. These results are wholly coherent with NPD management practices typical of the fashion industry. Every item is positioned on the market at the beginning of the NPD process with a target price. At that time, neither the bill of material nor the detailed production process of that item has been defined. This information comes from the industrialization phase, which happens just before the sample phase (or even after it, in some companies). This practice generates conflicts among business functions: technicians demand standardization, stylists pursue creativity, while marketing staffs research the market.

ID	Knowledge Management initiatives	Main sources of knowledge
A	Network shared folders, PDM/PLM	Previous projects, personal experience, personal intuition, collaboration with colleagues
B	Lessons Learned, Specification documents, Checklist, Intranet/Wiki, PDM/PLM	Written rules, previous projects, personal experience
C	Lessons learned, Specification documents, Visual management	Written rules, previous projects, personal experience, personal intuition
D	Specification documents, Network shared folders, Intranet, PDM/PLM	Previous projects, personal experience, written rules
E	Lessons learned, Specification documents, Checklist, Network shared folders, Intranet, PDM/PLM	Written rules, previous projects, personal experience, personal intuition, collaboration with colleagues
F	Specification documents, PDM/PLM	Personal experience, personal intuition, previous projects, written rules
G	Lessons learned, Specification documents, Visual management, Network shared folders, Intranet, PDM/PLM	Written rules, previous projects, personal experience, personal intuition, collaboration with colleagues
H	Specification documents, Network shared folders, PDM/PLM	Previous projects, personal experience, written rules

Table 5. Knowledge management in the fashion NPD process.

NPD problems and criticalities	A	B	C	D	E	F	G	H
Costs of projects are higher than pre-estimated budgets	XXX	X	X	X	X	X	X	X
Designers often make many changes during the design process that frequently result in design reworks	XX	X		X	XX	XX	XX	
The designers are overloaded and cannot keep up with the work load	XX		X		X	X	X	X
The projects are behind schedule because there are too many unnecessary and unneeded activities and tasks	X					X	X	X
In the development process the responsibilities are not well defined; as a result, the process is chaotic					X	X	X	X
The projects are too complex to be adequately managed and designers get lost in the activities	X					X	X	X
Designers spend considerable time writing long documents, specifications and reports		X			X	XX		
The development process involves too many signatures and bureaucracy is a norm		X					X	X
Engineers and designers experience difficulty in extracting knowledge from past projects	X				X			
The different systems used in the company (e.g., CAD, PDM, ERP) have different formats (e.g., file format), which cause frequent manual work					X			
<i>Legend: X=Sometimes XX=Often XXX=Always</i>								

Table 6. Problems and criticalities in the fashion NPD process.

To create a bill of material is a crucial task in the fashion industry; to this aim, the use of collaborative tools such as PDM/PLM could be beneficial. The higher the positioning of a company in the Saviolo and Testa pyramid [2], the more the creation of the BOM becomes very close to the fashion show. This implies the necessity for managing large amounts of information in a very short time; moreover, it is common for the stylist to require continuous changes in the collection, up to the point when the fashion show takes place.

Regarding the process organization, in half of the companies, the NPD process is chaotic. A formal NPD model is not in place, roles and responsibilities are not well defined; consequently, waste and problems in making decisions are generated. On the other hand, roles and responsibilities are usually clear and well defined in all of the analysed companies.

Companies have also been asked to describe the next planned investments for improving their NPD process. All the companies declared their intentions to introduce procedural and/or organizational changes in their particular process, confirming the criticalities described above. Three companies planned the introduction of new PDM/PLM systems to support collaboration and data management. Two companies planned the acquisition of some computer-aided tools for virtual prototyping. Finally, a couple of companies showed some interest in outsourcing part of their NPD process, even if for most of the companies, NPD represent a core process.

6. Conclusions

The paper aimed to answer to some research questions regarding the implementation of the NPD process in Italian fashion companies by conducting a multiple case study analysis.

Regarding the first research question, initial evidence of the research indicates that all of the companies declared to pursue the competitive factor of quality, whilst all the niche leaders also followed the customer service competitive factor. Regarding the levers for the success of the companies, the strategic role of the suppliers was highlighted. It is a matter of fact that the fashion market is composed of companies with different characteristics according to their specific market segment. The three companies positioned as *niche leaders* have both informal and formal NPD models. This is likely due to the fact that the number of items that the companies have to manage is low and even a NPD process that is not particularly well defined is able to support the development of the collections.

Regarding the second research question, several considerations can be drawn.

Initial evidence indicates that, even if in most of the fashion companies there is a strong influence of the designer in the management of the process, a NPD process nonetheless exists. Nevertheless, it is not often formally defined and stylists and designers generally have significant freedom to experiment.

For most of the companies the development process is strongly collaborative; tasks and activities are done in parallel and people involved in different functions contribute their know-how and collaborate from the first stages of the development process.

The existence of both small and big companies competing in the same market highlights another observation. Even if these companies declare to perceive the same CSF (quality, timeliness, suppliers relationship, etc.), their organization and consequently their NPD process, is strictly connected with their turnover and number of employees. The bigger the company is, the more the information that has to be managed during the NPD process, especially during the sampling phase. This means that companies with the same CSF can have different requirements in terms of organization, process and knowledge management in order to achieve the same performance in the NPD process. In other words, the NPD process requirements are not only related to the CSF, but also to complexity, which is linked to turnover. These aspects are more evident when focusing on the knowledge management of the NPD process. In general, most of the companies have some knowledge management initiatives in place, even if the role of personal tacit knowledge is still relevant for these companies.

Even if the NPD practices reported above seem to be adopted by most of the interviewed companies, a general issue emerging from this study is the heterogeneity of the approach among the sample and a deeper investigation seems necessary in order to understand the behaviour of this specific industry and its possible improvements.

In the opinion of the authors, there are two possible directions that should be perceived in order to improve the knowledge and enrich this research. The first should deal with the analysis of the literature regarding the NPD process of industries belonging to the fashion industry, even if belonging to different sectors and/or different countries (e.g., fast fashion, US companies etc.). The second should compare the results of this study with research focused on other traditional sectors (e.g., manufacturing, white goods industry etc.), in order to better identify differences and analogies. These topics represent the future actions that will be performed in order to complete this research.

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