



HAL
open science

Managing New Product Development in the Fashion Industry with PLM: Based on Market Classifications

Brendan Patrick Sullivan, Monica Rossi, Sameer Athavale, Virginia Fani, Bianca Bindi, Luca Ferraris, Romeo Bandinelli, Sergio Terzi

► **To cite this version:**

Brendan Patrick Sullivan, Monica Rossi, Sameer Athavale, Virginia Fani, Bianca Bindi, et al.. Managing New Product Development in the Fashion Industry with PLM: Based on Market Classifications. 18th IFIP International Conference on Product Lifecycle Management (PLM), Jul 2021, Curitiba, Brazil. pp.167-178, 10.1007/978-3-030-94335-6_12 . hal-04186136

HAL Id: hal-04186136

<https://inria.hal.science/hal-04186136v1>

Submitted on 23 Aug 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



This document is the original author manuscript of a paper submitted to an IFIP conference proceedings or other IFIP publication by Springer Nature. As such, there may be some differences in the official published version of the paper. Such differences, if any, are usually due to reformatting during preparation for publication or minor corrections made by the author(s) during final proofreading of the publication manuscript.

Managing New Product Development in the Fashion Industry with PLM: Based on Market Classifications

Brendan P. Sullivan¹[0000-0002-6798-1187], Monica Rossi¹[0000-0003-4971-2837], Sameer Athavale¹[0000-0001-9032-6458], Virginia Fani²[0000-0003-3668-7011], Bianca Bindi²[0000-0003-0242-3763], Luca Ferraris³, Romeo Bandinelli²[0000-0002-5547-4225], Sergio Terzi¹[0000-0003-0438-6185]

¹ Department of Management, Economics and Industrial Engineering - Politecnico di Milano, via Lambruschini 4/B, Milan 20156, Italy

² Dipartimento di Ingegneria Industriale – University of Florence, P.za di San Marco, 4, 50121 Firenze FI, Italy

³ Aptos Retail, Via Chiese, 72, 20126 Milano MI, Italy

brendan.sullivan@polimi.it, monica.rossi@polimi.it,
sameer.athavale@mail.polimi.it, virginia.fani@unifi.it,
bianca.bindi@unifi.it, luca.ferraris@aptos.com,
romeo.bandinelli@unifi.it, sergio.terzi@polimi.it

Abstract. Product Lifecycle Management (PLM) has become a crucial element to handle request for quotation management, throughout the product development process, bill of material management, product data management etc. The use of traditional PLM software has increased, having been applied to traditional manufacturing, and product development efforts. However to date the integration of PLM in the fashion industry has been limited with varying success. Although certain variables such as size, range, color, or collection have been integrated into the management system with ease, the specific functionalities of the PLM remain unclear. This is often contributed to the fact that fashion industry has a shorter product lifecycle and greater variation of product offerings. Based on the available literature and a use case study, the purpose of this research is to establish a set of standard PLM functionalities based on the needs of the fashion industry. By leveraging unique set of industry specific functionalities the conceptual framework developed aims to provide a competitive advantage to those involved by supporting the production of goods in mass market, premium market and luxury market fashion products.

Keywords: Product Lifecycle Management, PLM, Sustainability, Fashion.

1 Introduction

PLM is the process of managing the entire lifecycle of a product from engineering design and manufacture to service and disposal of manufactured product. From the concept design to the ultimate disposal, the whole lifecycle of a product is described through a detailed data collection. From this viewpoint, Product Lifecycle Management

can be described both as a product-focused database and a communication process among different entities (e.g., manufacturing, marketing, and commercial departments).

By helping people understanding how a product is designed, produced, and finally disposed of, PLM leads to many different benefits such as reduced time to market, increase full price sales, improved product quality and reliability, reduced costs, more accurate request for quote generation, ability to quickly identify potential sales opportunities and revenue contributions, savings through the re-use of original data, reduced waste [1]–[3]. PLM helps to ensure that the right data is available to the right person at the correct phase of the development process. At the same time, increasing consumers' awareness about product safety and error reduction can increase sales opportunities and revenue [4].

Fashion companies manage different product categories (e.g., leather goods, clothing, shoes, and accessories) and might belong to different market positioning (from fast fashion to luxury), but the critical success factors driving the industry are above all quality and time-to-market (TTM) [5]. The search for quality is revealed in the selection of materials and care in manufacturing processes, which are in some cases still bound to handcrafting traditions (especially for luxury brands). Then, the need to streamline TTM in order to please demanding consumers is pushing the fashion industry to revise its own processes and to reduce the bottlenecks within the entire supply chain.

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 [5]–[7]. As fashion industry is complex and diversified, we need to segment it in order to have a better understanding about the company, the product and the processes that company follow to produce the product. Therefore, a distinction has to be made in the fashion industry. In this research, the main criteria have been considered as the market that particular servers, mainly divided into mass market and luxury market, in order to understand distinction of the fashion industry.

1.1 Problem statement and Research Objectives

PLM puts the focus on “the product”. The company's products are what the customer buys. PLM addresses the heart of the company, its defining resource, the source of its wealth, its products. Considering a product development process in which a core team of professionals from many disciplines sets out to create a product that satisfies a specific customer need [8]. In case of fashion industry, companies need to be agile, sensitive to changing customer needs, constantly monitoring customer buying behavior and delivering high quality. What often takes second place is the way these features are managed and balanced. Fashion companies currently are facing challenges to improve their competitiveness; a demand for innovation is currently affecting the whole supply chain, from product development [2], [9]. The information pertaining to fashion industry needs and its usage of PLM system is little and scattered. It is necessary to compile the information to understand how fashion industry is currently using the PLM to overcome those challenges. Therefore, the research question is formed, “How PLM solution

has been adopted in the fashion industry?” To answer it, the approach to answer this is to have a systematic literature review pertaining to definition of PLM systems and fashion industry. The second approach is to have the interaction with the industry experts in the PLM and fashion industry. By answering this research question current scenario of PLM usage in the fashion industry can be captured which will help to identify PLM functionalities used to solve the needs and challenges of the fashion industry.

Speaking about the fashion industry, today’s fashion business demands a high degree of collaboration and global business skill. What often takes second place is the way these features are managed and balanced. Fashion companies currently are facing challenges to improve their competitiveness; a demand for innovation is currently affecting the whole supply chain, from product development, through PLM systems and 3D software, to retailing, thanks to the ‘digital revolution’. The economic pressures bearing on fashion companies come from both end users and retailers expect lower and lower prices, while the costs of sourcing, manufacturing. Fashion industry, in particular, is characterized by trends that change rapidly and consumers across the world expecting to choose the latest product. Managing a large repository of information involving stakeholders from different parts of the world brings down the operational efficiency of the company [4], [5]. PLM strategies aim to integrate information throughout a products life cycle from the imagination of the product to the design and realization of the product and information about the use and recycling of the product. PLM system supports everyone in the organization, from purchasing and selecting the raw materials, to product designs, production preparation. The notion of cohesion and traceability of information is reported as being crucial for improved data management of PLM systems [10]. After understanding the adoption of PLM solution in fashion industry, the problem still remains on recognizing which PLM functions can help optimize activities of fashion industry because the PLM system is very complex as it covers full lifecycle of the product. Hence, the second research question of this paper, derived from the first one, can be formed, “How PLM functionalities can suffice the characteristics which are affecting the fashion industry, leading to the specific needs?” Firstly, it is important to understand the PLM functionalities through the literature. A conceptual framework is developed to understand the link between needs of the fashion industry and PLM functionalities. This research questions puts a different perspective to understand the fashion industry.

1.2 Research Methodology

This research focuses on PLM system functionalities and the fashion industry. A new perspective towards the adaptation of enterprises to PLM systems will be analyzed as well as the current challenges in the fashion industry, also unlocked certain characteristics that did not exist before. Following **Erro! Fonte de referência não encontrada.** represents the flow chart of the approach.

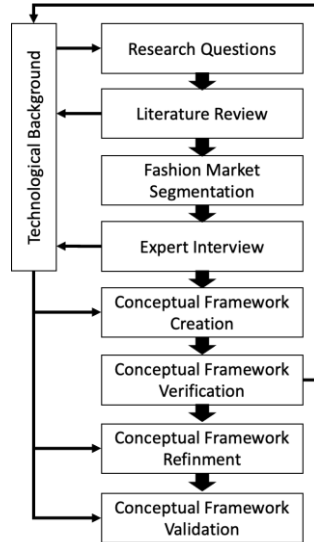


Fig. 1. Research Framework

2 Technological Background

The literature review started by understanding the PLM system. PLM is able to manage the data concerning a product, and all the internal and external factors involved in the development of this product [1], [10], [11]. PLM has marked the transition from a departmental approach in product development, when each department defined its own activities independently of the other functions, to a collaborative and holistic approach [9]. PLM is viewed as a system that supports the evolution and change of data during the product lifecycle. PLM enables the optimization of business processes, improved integration and reduced costs [5].

Many research have characterized the literature about PLM in the last two decades[9]. A limited number of contributions related to retail companies exist, such as the ones belonging to the high-end and low-end market segments of the fashion industry [4], [5]. The first step in achieving the goal of this study has been the examination of the relevant literature. Three main sources were used to gather relevant research papers which are “Scopus”, “Google Scholar” and “sci-hub”. The main key words used to understand the PLM systems were “PLM”, “Product data management”, “PLM deployment”, “PLM software implementation”, “PLM definition”, “PLM functionalities”. After looking at the literature, it is understood that that there had been many published papers and case studies pertaining to PLM systems and its usage particularly in automotive and industrial sector. To see the relevant literature pertaining to fashion companies, “fashion industry”, “luxury market”, “classification of luxury market”, “mass market”, “needs of the fashion industry”, “characteristics of the fashion industry”. The most relevant papers were found by the keyword “PLM fashion industry”. Through this, research and usage of PLM functionalities used in fashion industry were found. These

functionalities were used as a key word in order to look for the definition of these functionalities. Moving forward the detailed explanation regarding PLM systems, fashion industry, PLM usage in the fashion industry, fashion industry characteristics and needs have been discussed.

2.1 Fashion market segmentation

Definition of luxury is not merely a philosophical or academic exercise. Most studies in the research literature do not differentiate between the term's "prestige", "status", and "luxury" [12], although the first two terms display different nuances of meaning for consumers. Some researchers have investigated luxury as a property of brands and have described it using vague terms such as "dream value" or "impression" [13]. Finally, a few studies have differentiated between the concept of "luxury" and the luxury product or service. For instance, researchers have focused on what the concept of luxury means to consumers (e.g., "luxury for me is having more leisure time in the day"); other researchers have examined the meaning of luxury in the marketing context (e.g., what differentiates a luxury product from a high-quality product). An additional confusion is whether the term "luxury" primarily refers to a product or to a brand [14].

On the one hand, consumers confused using the word luxury for a wide range of goods progressively lose the ability to recognize the characteristics that justify the premium price of a luxury good or service, increasing the risk of dissatisfaction with the products they purchase. On the other hand, manufacturers who have noticed that the return is much higher when premium prices are charged for slightly above-average products might be less motivated to engage in a quest for excellence, leading to a slow but steady decline in product quality [15].

The transformation of luxury into precious objects and lavish living was necessary to open the realm of luxury to any social class. Finally, the second industrial revolution at the end of the nineteenth century gave the concept of luxury the modern meaning of the "habit of indulgence in what is choice or costly" or "something enjoyable or comfortable beyond the necessities of life". Of course, this transformation contributed to the different interpretations of the concept of luxury, such as status symbol, personal indulgence, and leisure time, among others [16].

Luxury goods are not consumed for their intrinsic value but to impress others and signal wealth and conspicuous consumption. Luxury goods are defined by their relative price and are valued because they are costly and exclusive. In contrast, luxury cannot be defined solely in terms of higher price, [12] note that expensive products may not necessarily be viewed as luxuries. For luxury goods, perceived high cost – in absolute or relative terms – is a necessary but not sufficient condition. In addition to high price, luxury brands feature excellent quality and specialized distribution channels [6].

From a subjective point-of-view, the term luxury might refer to "things you have that I think you shouldn't have" [17]. Most luxury products are also associated with a strong brand name and logo, as well as a tradition of craftsmanship and high performance [18]. The role of the brand in evoking exclusivity; in their view, current luxury products have a well-known brand identity, enjoy high brand awareness and perceived quality, and maintain customer loyalty and sales levels. Hence, luxury objects should be

recognizable, stimulate an emotional consumer response, and become incorporated into the customer's lifestyle. [19] proposed to divide luxury brands into two categories: those that primarily have symbolic value for the customer and are valued due to lifestyle rather than functionality (e.g., Louis Vuitton), and those that primarily are valued due to their technical features (e.g. the world-class performance of Porsche vehicles).

Another important feature is the prestige associated with the brand and its uniqueness or exclusivity [6]. Luxury brands such as Rolex are perceived and marketed as timeless, and modern through the selection of materials, and the premium price that is attached. Balance between these characteristics is difficult to achieve, luxury brands exist in a highly exclusive market niche that is driven by unique marketing phenomena which suggests why uniqueness and exclusivity are relevant. Furthermore, this suggests that specific management approaches for luxury businesses are worth developing in departments other than marketing. [20] suggest that success in the luxury market is primarily related to:

- Excellence. For the consumer, the feature most strongly associated with luxury is the superior quality of the product and associated services, which is essential to justify the premium paid by consumers.
- Brand aura. For the consumer, continued excellence over time allows the brand to acquire a strong reputation and maintain a first-class position. To achieve luxury status, brands need to have a strong, legitimate, and identifiable aura.
- Desirability. Luxury goods companies must create and maintain desirability. One feature of desirability is a strong aesthetic appeal that is modern but related to traditional values; another feature is high price, which strengthens the product's social status. The product's rarity and uniqueness also increase desirability.

The luxury market separates into exclusive goods and accessible lines. Exclusive goods rely on rarity due to natural shortages of materials and manufacturing capacity, limited editions, or artificially maintained rarity, while in accessible lines, rarity is information based and achieved through selective distribution, exclusive shopping atmosphere, price, provenance from heritage centers, packaging, or combination of two brands [21]. A new luxury category in which consumers are less interested in the product itself and more interested in the image associated with the brand. New luxury refers to goods that are not necessarily rare or manufactured in low volume; these goods acquire the luxury label due to design, additional services or the aura created by the brand. The emergence of "accessible luxury" products is due in part to the tendency to trade up that currently characterizes consumption habits. Heritage and prestige have always been the hallmarks of many luxury brands. Because some luxury brands are hundreds of years old, the enduring quality of a particular luxury good can be part of its appeal, and this is especially true for the traditional view of luxury. However, some consumers – particularly those who are young and fashion-conscious – prefer a product with a fresh and unusual look and an exclusive aura rather than actual rarity [22]. To attract this category of consumer, the brand image – focused on a label, a logo or a symbol – is crucial. This is the idea behind accessible luxury (or new luxury) as opposed to old luxury (or traditional luxury), which targets elite consumers and relies on product authenticity based

on precious materials, heritage, craftsmanship, and natural rarity. Instead, new luxury targets the upper middle market, is positioned at a lower price, and includes three types of products [23]:

- Accessible super-premium goods. Products that are priced at near the top of their category that middle-market consumers can afford.
- Old luxury brand extensions. Lower priced versions of goods that traditionally only the wealthy could afford.
- Masstige (merging mass with prestige). Premium products midway between mass-produced and first class, which are well below the highest priced goods in their category.

Based on the literature it is appropriate to segment the market in luxury market and mass market. Following **Erro! Fonte de referência não encontrada.** is the chart which explains the distinction between luxury market and mass market.

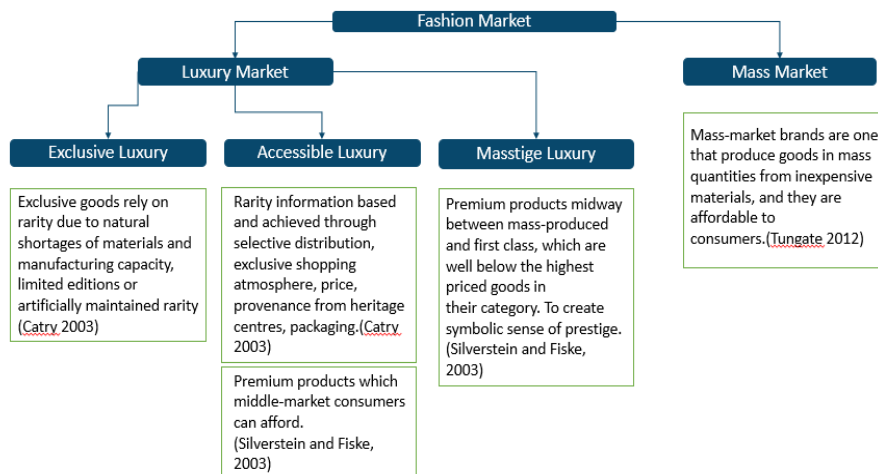


Fig. 2. Fashion Market Segmentation

2.2 PLM functionalities in the Fashion Industry

The literature review was conducted on papers related to PLM functionalities with a specific focus on the fashion system, due to the evidence that there is a lack in a unique definition of the overall functionalities of a PLM software for that industry. More specifically, a single reference that exhaustively collects all the functionalities has not been found. Therefore, this gap is filled with the expert interviews and the case study and the research is focused on a selection of them. In addition, a specific functionality is often differently named in different papers, making the identification of a complete and clear set of unique PLM functionalities for the fashion industry difficult to figure out.

Based on the literature, a review of the PLM functionalities has been carried out. The results of this part of the work are not included into this paper due to limit restriction.

3 PLM conceptual model

The Industry 4.0 revolution has pushed PLM software houses towards the introduction of new functionalities that cover a wider range of supply chain (SC) processes, especially in the fashion industry [4]. According to this, a research framework has been created to understand needs and characteristics of the fashion industry.

Conceptual framework is focused on six main characteristics which are affecting the fashion industry. These characteristics as shown in the table below are linked with the needs of fashion industry based on the literature.

Table 1. Fashion Industry Characteristics

1.	Ability to meet delivery time [24], [25]
2.	Sufficing demands of the fashion products based on weather, seasonality, current and near future trends [10], [26]
3.	Globalization, new product design and development activity [15], [16]
4.	Features, style and patterns of product [5], [25]
5.	Quality inspection from raw materials to the delivery of the final products [27], [28]
6.	Complexity of the fashion industry [29]

These characteristics push the company towards the specific needs that we have listed based on what we have found in the literature. We are analyzing relationship between characteristics and needs of the fashion industry in the framework. How these characteristics are affecting the fashion industry and PLM system, PLM functionalities can cover those needs. Moving forward we have correlated these characteristics to more than one need of the fashion Industry.

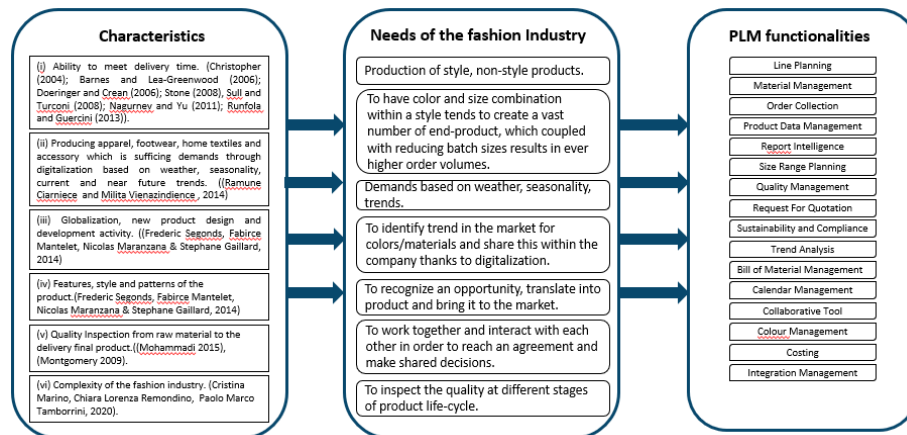


Fig. 3. Conceptual Framework

Further, each characteristic has been deeply explained, in terms of needs and PLM functionalities. Due to space limit, only the first characteristic is reported in the paper.

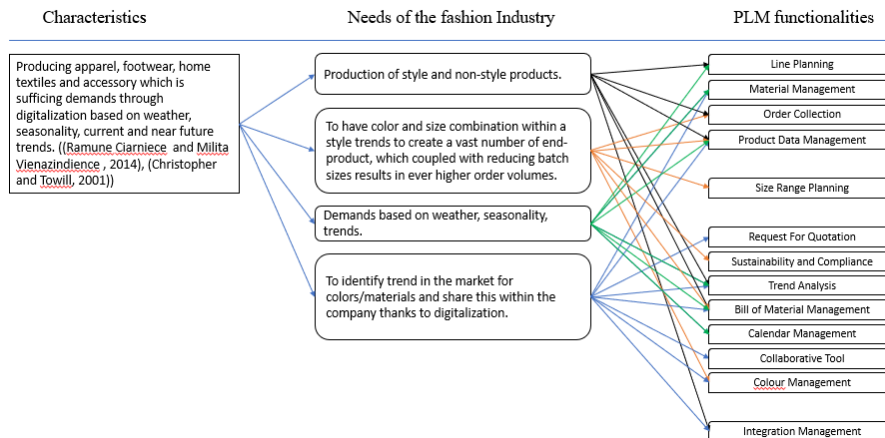


Fig. 4. Product apparel, footwear, home textile and accessory which is sufficing demands through digitalization based on weather, seasonality, trends

Apparel, footwear, home textiles and accessories manufacturers mainly produce a mix of style-based and non-style-based products. The combination of color and size combination within a style tends to create a vast number of end-product, which coupled with reducing batch sizes results in ever higher order volumes. At the same time, customers are demanding shorter and shorter lead times, increasing the pressure to make decisions more quickly. Demand for these products is rarely stable or linear. It may be influenced by many external factors such as the shifts in weather, seasonality and social trends.

Fashion companies produce goods based on trends and seasonality, in order to sell higher volumes. As far as exclusive luxury is concerned, they create the market trends and companies who belong to Masstige luxury and Mass market follow that trend. Based on the seasonality appropriate color, material, size combination is selected. Companies consists of multiple departments with multiple locations, digitalization plays an important role to collaborate with each other.

Digitalization is also helping companies in a current pandemic situation where employees of the companies are interconnected with each other as well as since many touchpoints with customers are closed online channels are working very efficiently. Exclusive luxury companies never put their goods on a wholesale channels. They have their own platforms to present their collection.

Exclusive luxury companies focused heavily on inhouse product design and development of goods. Their exclusivity can be seen from their very high-quality standard and heritage aura of the product. As far as mass market is concerned even though they have some design activity may be inhouse or outsource, they start their line plan with the design activity or even before design activity.

4 Outcomes

In order to verify the conceptual framework exposed in the previous section, a focus interview is dedicated with a shoe industry PLM expert. Through the practical and theoretical information obtained the conceptual framework was refined and validated.

Speaking about the organization he is working, the company is in Detmold, Nordrhein-Westfalen, Germany and is part of the Shoe Stores Industry. The company is one of the largest shoe production and distribution companies in Europe.

Based on the needs and characteristic, the company representative supported the validation of the conceptual framework, whereby sustainability and compliance and were further addressed. Especially when it comes to the sustainability, from the beginning it is the request of the market and consumers are also focused on this now more than the past. Companies have demands on laws which are coming now, and companies must consider sustainability of the product. Due to these reasons, sustainability and compliance has become the important need of the fashion industry. The verification of the framework ensured that the relationships between characteristic and the quality inspection from raw material to the delivery of the final product is well founded.

5 Discussion

The research proposes a framework to support PLM implementation in the fashion industry. The main result of the research study is a conceptual framework based on needs of the fashion industry drawn from its characteristics and linking the needs of the fashion industry to the PLM functionalities. The framework is based on the evidence collected from the literature, case study and expert's opinions on current scenario of PLM and fashion industry. After the development of the framework, it has been validated through structured focus interviews with an expert from fashion industry company. From a scientific point of view, the proposed framework gives a new perspective to understand the needs of the fashion industry and creates the link between needs and PLM functionalities in the fashion industry which answers the research question pertaining to how PLM functionalities can suffice the needs of the fashion industry drawn from its characteristics.

To strengthen the validation of the proposed framework, a wider sample of companies should be involved, differentiating both in terms of managed products (shoes, accessories, etc) and market segmentation (mass market, masstige, accessible luxury, exclusive luxury).

References

- [1] A. Corallo, M. E. Latino, M. Lazoi, S. Lettera, M. Marra, and S. Verardi, "Defining Product Lifecycle Management: A Journey across Features, Definitions, and Concepts," *ISRN Ind. Eng.*, vol. 2013, pp. 1–10, 2013, doi: 10.1155/2013/170812.
- [2] S. Terzi, A. Bouras, D. Dutta, D. Kiritsis, and M. Garetti, "Product lifecycle

- management – from its history to its new role,” *Int. J. Prod. Lifecycle Manag.*, vol. 4, no. 4, pp. 360–389, 2010, doi: 10.1504/IJPLM.2010.036489.
- [3] E. d’Avolio, C. Pinna, R. Bandinelli, S. Terzi, and R. Rinaldi, “Analysing product development process and plm features in the food and fashion industries,” *IFIP Adv. Inf. Commun. Technol.*, vol. 517, pp. 509–521, 2017, doi: 10.1007/978-3-319-72905-3_45.
- [4] V. Fani, R. Bandinelli, and B. Bindi, “PLM Functionalities in the Fashion Industry. Preliminary Results of a Classification Framework,” in *IFIP Advances in Information and Communication Technology*, 2020, vol. 594, pp. 527–537, doi: 10.1007/978-3-030-62807-9_42.
- [5] E. D’Avolio, R. Bandinelli, and R. Rinaldi, “How product development can be improved in fast fashion industry: An Italian case,” *IFIP Adv. Inf. Commun. Technol.*, vol. 467, pp. 718–728, 2016, doi: 10.1007/978-3-319-33111-9_65.
- [6] J. N. Kapferer and V. Bastien, “The specificity of luxury management: Turning marketing upside down,” *J. Brand Manag.*, vol. 16, no. 5–6, pp. 311–322, 2009, doi: 10.1057/bm.2008.51.
- [7] V. Fani, C. Falchi, B. Bindi, and R. Bandinelli, “Implementation framework for PLM: a case study in the fashion industry,” *Int. J. Adv. Manuf. Technol.*, vol. 113, no. 1–2, pp. 435–448, 2021, doi: 10.1007/s00170-021-06623-4.
- [8] A. G. Kalyanaram, V. Krishnan, S. Journal, and N. May, “Linked references are available on JSTOR for this article: Deliberate Product Definition: Customizing the Product Definition Process,” *J. Mark. Res.*, vol. 34, no. 2, pp. 276–285, 1997.
- [9] M. Garetti and S. Terzi, “Product Lifecycle Management: Definizione , Caratteristiche e Questioni Aperte,” in *Tech. Rep., Politecnico di Milano*, 2003, no. January 2003, p. 16.
- [10] M. David and F. Rowe, “What does PLMS (product lifecycle management systems) manage: Data or documents? Complementarity and contingency for SMEs,” *Comput. Ind.*, vol. 75, pp. 140–150, 2016, doi: 10.1016/j.compind.2015.05.005.
- [11] R. S. Batenburg, R. W. Helms, and J. Versendaal, “PLM roadmap: Stepwise PLM implementation based on the concepts of maturity and alignment,” *Int. J. Prod. Lifecycle Manag.*, vol. 1, no. 4, pp. 333–351, 2006, doi: 10.1504/IJPLM.2006.011053.
- [12] B. Dubois and S. Czellar, “Prestige Brands or Luxury Brands? An Exploratory Inquire on Consumer Perceptions,” *Eur. Mark. Acad.*, pp. 1–9, 2002.
- [13] B. Dubois, S. Czellar, and G. Laurent, “Consumer segments based on attitudes toward luxury: Empirical evidence from twenty countries,” *Mark. Lett.*, vol. 16, no. 2, pp. 115–128, 2005, doi: 10.1007/s11002-005-2172-0.
- [14] F. Vigneron and L. W. Johnson, “A Review and a Conceptual Framework of Prestige-Seeking Consumer Behavior,” *Acad. Mark. Sci. Rev.*, vol. 3, no. 1, pp. 1–17, 1999.
- [15] A. Brun and C. Castelli, “The nature of luxury: A consumer perspective,” *Int. J. Retail Distrib. Manag.*, vol. 41, no. 11–12, pp. 823–847, 2013, doi: 10.1108/IJRDM-01-2013-0006.

- [16] Y. Seo and M. Buchanan-Oliver, "Luxury branding: the industry, trends, and future conceptualisations," *Asia Pacific J. Mark. Logist.*, vol. 27, no. 1, pp. 82–98, 2015, doi: 10.1108/APJML-10-2014-0148.
- [17] J. B. Twitchell, *Living It Up: America's Love Affair with Luxury*. Simon & Schuster; Reprint, 2003.
- [18] J. A. Quelch, "Marketing the premium product," *Bus. Horiz.*, vol. 30, no. 3, pp. 38–45, 1987, doi: 10.1016/0007-6813(87)90035-8.
- [19] M. Reddy and N. Terblanche, "How not to extend your luxury brand," *Harv. Bus. Rev.*, vol. 83, no. 12, 2005.
- [20] P. Antoni, F., Burgelman, R.A. and Meza, "LVMH in 2004: the challenges of strategic integration," *Harvard Business School case*, 2004.
- [21] B. Catry, "The great pretenders: The magic of luxury goods," *Bus. Strateg. Rev.*, vol. 14, no. 3, pp. 10–17, 2003, doi: 10.1111/1467-8616.00267.
- [22] J. Hanna, "Luxury Isn't What It Used to Be," *Harvard Business School case*, 2004.
- [23] M. J. Silverstein and N. Fiske, "Luxury for the Masses," *Harvard Business Review*, 2003.
- [24] L. Barnes and G. Lea-Greenwood, "Fast fashioning the supply chain: Shaping the research agenda," *J. Fash. Mark. Manag. An Int. J.*, vol. 10, no. 3, pp. 259–271, 2006, doi: 10.1108/13612020610679259.
- [25] P. Doeringer and S. Crean, "Can fast fashion save the US apparel industry?," *Socio-Economic Rev.*, vol. 4, no. 3, pp. 353–377, 2006, doi: 10.1093/ser/mwl014.
- [26] M. Christopher and D. Towill, "An integrated model for the design of agile supply chains," *Int. J. Phys. Distrib. Logist. Manag.*, vol. 31, no. 4, pp. 235–246, 2001, doi: 10.1108/09600030110394914.
- [27] A. Brun *et al.*, "Logistics and supply chain management in luxury fashion retail: Empirical investigation of Italian firms," *Int. J. Prod. Econ.*, vol. 114, no. 2, pp. 554–570, 2008, doi: 10.1016/j.ijpe.2008.02.003.
- [28] M. M. Sizwe and M. Charles, "Quality control in the clothing production process of an under-resourced sewing co-operative: Case study," *Proc. Int. Conf. Ind. Eng. Oper. Manag.*, vol. 2017, no. JUL, pp. 698–707, 2017.
- [29] C. Marino, C. L. Remondino, and P. M. Tamborrini, "Understanding fashion complexity through a systemic data approach," *Strateg. Des. Res. J.*, vol. 13, no. 2, pp. 268–283, 2020, doi: 10.4013/SDRJ.2020.132.10.