Digital transformation of a small fashion house: a PLM implementation

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Abstract

Purpose - The aim of this paper is to explore the digital transformation phenomenon in the fashion industry and the key role that information technologies can play in it. More specifically, we are identifying some relevant factors in a product lifecycle management (PLM) implementation for the digital transformation of fashion companies.

Design/methodology/approach - The methodology used in this paper is the case study. From author's field experience, we present the real case of a small fashion house which -with the collaboration and support of a well-known software firm- is implementing a Product Lifecycle Management (PLM) solution.

Findings - We analyze how the firm-related variables, previously described in the theoretical framework, influence in the case study, and we identify some important factors affecting positively, and one of them in particular: the one centered on employees' mindset and attitude.

Practical implications - Fashion companies are facing the huge challenge of implementing new technologies to drive their digital transformation. Therefore, this paper can shed light to practitioners on how to approach this challenge and understand the real benefits of technology for their business.

Originality/value - The digital transformation by implementing information technologies is a very recent field of study and academic research is scarce. Thus, with a case study we enrich a theoretical framework in the specific context of the fashion industry, and we extend it with some of the factors influencing technology implementation in the context of digital transformation.

Keywords
Fashion industry; small fashion house; haute couture; digital transformation; technology implementation; product lifecycle management.

Article classification
Case study

1. Introduction

The impact of technology in business and organizations is not a new research topic but it is the nature of the impact, and the manner and pace at which it is transforming companies, what is asking for attention and research nowadays. CEOs, in every industry, are more and more concerned about the digital transformation phenomenon and the effects in business as they already think technology factors are the first external force reshaping their companies (IBM, 2013). According to Klaus Schwab, founder of the World Economic Forum, we are in the beginning of a fourth industrial revolution, which is built on the digital revolution. In his words: "There is no doubt that emerging technologies, almost always powered and enabled by digital capabilities, are increasing the speed and scale of change in businesses" (Schwab, 2016, p. 50). During the last decade we have seen how fast digital technology has transformed the media and entertainment industries, but now we are seeing how it is transforming the rest of industries (Westerman et al., 2011). In fact, for instance, almost the 90% of business leaders in the U.S and U.K expect IT and digital technologies to make an increasing strategic contribution to their businesses in the next years (Bonnet et al., 2012).

Framed in this technological change context, this paper focuses on the specific case of the fashion industry, in which the digital transformation is posing a huge challenge as it has been historically quite disconnected of technological advances. Nevertheless, during the last decades –driven mainly by the adoption of the fast fashion business model- we have started to see how companies in this industry have begun to rely on technological tools such as Enterprise Resource Planning (ERP) or Product Lifecycle Management (PLM) in order to better manage their operations and to be able to respond in time to customer expectations. But still, as it will be shown later in the paper, this can be considered to be a very recent field of study with scarce academic research. Therefore, the aim of this paper is to contribute to this research field by exploring how the digital transformation phenomenon –with the specific case of a Product Lifecycle Management (PLM) tool implementation- can be approached within a small fashion company (an Haute Couture house); and, to understand which could be some of the relevant factors in the implementation process to have in mind if the company wants to achieve a sustainable digital transformation.

The paper is organized as follows. In the next section, the theoretical framework in which the research can be framed is presented. Then, the methodology used for the research is explained and the case study is described. Finally, the last sections share the findings, managerial implications, and conclusions with limitations and further research.

2. Theoretical framework

In this section we aim to introduce the theoretical context in which we frame our research, in order to clearly identify both the scope and the contribution of this paper. The literature review we present is based on Figure 1. First, the recent concept of *digital transformation* and its context

is explored; then, the relationship between *information technology (IT)* and this phenomenon is addressed; and we end with the analysis of these topics in the *fashion industry*. Lastly, we conclude with the explanation of how this paper can help to enrich this theoretical framework (grey part in figure 1).
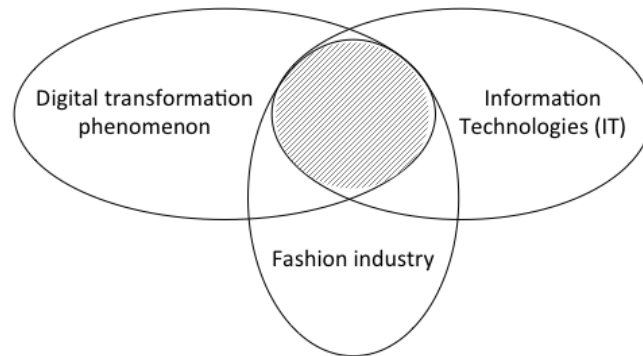

Fig. 1: Topics analyzed in the literature review.

2.1. *The digital transformation phenomenon*

The literature review around this topic is conducted towards understanding the concept and its context, by building an analytical framework that identifies the important ideas around this recent research topic.

The digital transformation is becoming a hot topic for all companies worldwide (Westerman et al., 2011). According to experts in this phenomenon, it mainly has to do with the use of new digital technologies –as well as more traditional ones- to radically improve the performance of the company, underlying changes in three areas of the business: customer relationship and experience, internal processes and operations, and value propositions or business models (Fitzgerald et al., 2013). Following this idea, we have developed an analytical framework for the digital transformation phenomenon (Figure 2), which is based on the identification of: its causes or reasons ("the why"), its consequences or implications in firms ("the what"), and its achievement ("the how").

The general context seems evident: the advancements in digital technologies –and their fast adoption- during the last decades have fostered fundamental shifts in a lot of aspects of the social and economic lives (Piccinini et al., 2015; Bharadwaj et al., 2013; Schwab, 2016). However, in addition to digitalization –referred to the adoption of these digital technologies into everyday life-, other megatrends like globalization, sharing economy, new consumer behavior trends, and a fierce competition are also considered key *drivers* of this phenomenon (Piccinini et al., 2015; Gimpel et al., 2012, Schwab, 2016). Thus, these megatrends are having an impact in the business landscape, pushing companies to adapt themselves to this new environment with the use of a wide

range of technologies available to them. Therefore, it is also the fast evolution of these technologies during the last decade -and their increasing accessibility- what has made possible this phenomenon to happen; and thus they can be considered the *enablers* of the digital transformation. According to the empirical research carried out by MIT and Capgemini Consulting, there are four main emerging technologies disrupting business: social and collaborative technologies, data analytics, mobile technologies and smart-embedded devices (Westerman et al., 2011; Fitzgerald et al., 2013). The latter is associated to the Internet of Things (IoT), considered also by a lot of authors a key technology in this new technological wave (Porter, 2014; Schwab, 2016; Kagermann et al, 2013; Gilchrist, 2016, etc.). In addition to these, technologies such as cloud-computing services are also considered a key technology for companies' transformation (Bharadwaj, 2013; Piccinini et al., 2015), as well as others like 3D technology, cyber-physical systems and virtual reality, which have been identified as core technologies for instance in the digital transformation of manufacturing industry (Kagermann et al, 2013; Hermann et al., 2016; Gilchrist, 2016). However, not only these new and emerging technologies are the ones that enable digital transformation of companies, but also more traditional information technology (IT) ones (Westerman et al., 2011; Matt et al., 2015; Hess at al., 2016; Bharadwaj, 2013). In our analytical framework (Figure 2) these two first ideas -*drivers* and *enablers*-, which are represented in the left side, explain the origin of this phenomenon ("the why").

Then, once we know about the causes, we want to understand the consequences or implications of this phenomenon in companies ("the what"). This step is defined in the right part of the framework and it is divided into two blocks: *areas of impact* and *capabilities needed*. On the one hand, we find consensus in literature (Westerman et al., 2011; Fitzgerald et al., 2013; Schwab, 2016) concerning the main areas of impact of this phenomenon, which are: the product, the customer relationship and experience, the internal operational processes, and the business model or value proposition. Each of them can be seen as the consequence resulting from the mix of drivers with enablers (listed in the left side of the framework); for instance, the new customer behaviors and expectations (driver) coupled with technologies such social media and mobile (enablers) have pushed changes in the customer-side of business where a new kind relationship has to be built and new experiences have to be offered. On the other hand, the digital transformation phenomenon entails the creation of new capabilities within companies, which are considered essential in order to be able to achieve the digital transformation (Westerman et al., 2011; Fichmann et al., 2014; Matt et al., 2015). A selection of such capabilities from literature is proposed: digital leadership, digital investment, digital skills, a digital-ready culture, a digital platform (unifying data and processes), or the capability of aligning business and IT.

Finally, the last part of the framework is the one that address "the how": how to manage the consequences and implications of this phenomenon ("the what") within the company, defining and implementing a digital transformation strategy. This is the part where less academic discussion has been found (Matt et al., 2015; Piccinini et al., 2015; Hess et al., 2016). Besides, it is also an area where more executives get stuck. So, although they are aware of the digital transformation imperative -almost 90% of business leaders in the U.S and U.K expect digital technologies to make an increasing strategic contribution to their companies (Bonnet et al., 2012)-, the reality is that in practice there are still few of them achieving real transformations (Fitzgerald et al., 2013). Despite the fact that some general roadmaps and lists of challenges have started to be defined by several researchers in order to help companies preparing and addressing this issue strategically (Westerman et al. 2011; Matt et al., 2015; Hess et al., 2016), the truth is that there is not a common recipe valid for every company. This is mainly because there are some factors and variables that can influence differently in the definition and development of a company's digital transformation strategy and in the way the implications are managed (see figure 2), which may consequently lead the company to face different challenges. Some of these factors identified in the literature are the following: (1) *the industry* in which the company operates can be a factor to take into account as digital technologies affect differently to each industry. Depending on the digital maturity level of the industry, the speed of the transformation can vary, as well as the degree of competitive pressure, what leads companies to drive digital transformation through different approaches (Westerman et al., 2011). Each industry faces particular challenges and barriers related to their activity, as for instance, regulation and reputation issues in the financial and healthcare industries (Westerman et al., 2011). (2) Another variable that influences the way a company faces digital transformation is related to the *position of the company in the value chain,* depending if it is more in the demand-side or the supply-side (Schwab, 2016). Due to the increasing digital empowerment of customers in the last years, the pressure for transforming digitally has been higher in B2C companies than in B2B, therefore the challenges and the need for change might defer from one company to another. (3) The *size of the company* could also be a factor to take into account when planning the digital transformation of a company (Coreynen et al., 2016). The smaller the company is, the more flexible and agile will be to transform its business and operations. Therefore, bigger companies will face more difficulties and challenges, and consequently the speed and rhythm of change will be slower. (4) And, last but not least, another crucial factor identified is the employees' mindset and attitude. The aspects related to people behavior towards digital transformation of companies are gaining more and more importance (Accenture, 2016; Bessen, 2014). In the end, it is the people and not only the technology that will make this transformation possible, and thus depending on each company's employees the efforts to be done and the strategy to follow will be different.
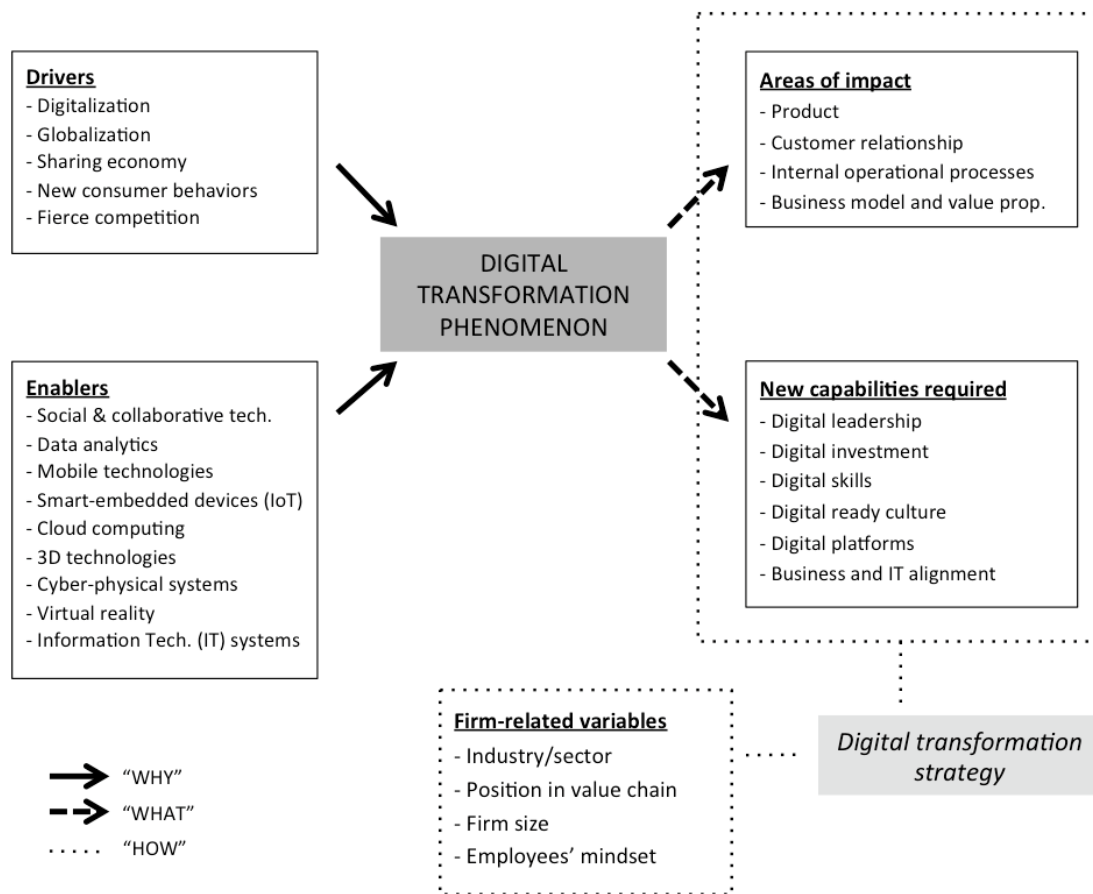
Fig. 2: Analytical framework for "digital transformation"

2.2. The role of traditional IT in the digital transformation

Once we have reviewed the general theory around the digital transformation phenomenon and organized it in an analytical framework (Figure 2), the next step is to address the specific topic of Information Technologies (IT) within this context, in order to understand the role they play and how companies can use them to transform themselves digitally.

According to March and Smith (1995) information technology is a type of technology that is used in a company to acquire and process information in order to support human purposes and decision-making; and it has been pervasive throughout the industrialized world leading companies to important improvements and helping others defining the competitive marketplace. These traditional IT systems are often known as Enterprise Systems (ES) and they represent an important technology option for companies' operations management (Hendricks et al., 2007). Among these traditional IT-based solutions we can find: CRM (customer relationship management), in order to manage and support the communications and information related to customers (Rigby et al., 2002); SCM (supply chain management), for managing and coordinating information among company's supply chain partners (Lee et al., 1997); ERP (enterprise resource

planning), designed to manage the resources within a company, integrating and optimizing business processes and transactions (Moon, 2007); or PLM (product lifecycle management), to support the product planning and development process managing the product data throughout its lifecycle (Ameri and Dutta, 2005).

Several streams of research can be found in literature related to IT but the most interesting for our research is the one that aims at studying its contribution to the improvement of business performance and organizational change (Brynjolfsson and Hitt, 1996; Hitt and Brynjolfsson, 1997; McAfee, 2002; Hitt et al., 2002; Kohli and Devaraj 2003; among others). In this research stream –also known as "IT business value"- different empirical studies have been carried out at the firm level in order to show how investments in IT can be associated to higher productivity and organizational transformation, by for instance reducing costs or increasing output quality -in terms of new products or improvements of intangible aspects of existing products-, as well as by complementing changes in other aspects of the organization (Brynjolfsson and Hitt, 2000).

Therefore, knowing this, it is not surprising the fact that traditional IT systems are also playing an important role in the actual digital transformation endeavor (Westerman et al., 2011; Matt et al., 2015; Hess at al., 2016; Bharadwaj, 2013). Back in the 2000s -with the success of the Internet and the e-commerce- some authors started to discuss about the importance of IT in the emerging digital economy, the new ways in which companies could exploit these technologies, and the new role IT was going to play in organizations (Brynjolfsson, 2002; Kling and Lamb, 2002; Banker et al., 2006; El Sawy, 2003; Sambamurthy et al. 2003). This discussion has continued over the last decade recognizing the strategic role of this technology -as new business models have been emerging and entire industries have been transformed by IT (Dhar and Sundararajan, 2007; Lu and Ramamurthy 2011)-, and its alignment with business for achieving a digital business strategy (Bharadwaj et al., 2013).

According to experts in the field, the most fundamental technology need for digital transformation is a digital platform of integrated data and processes (Westerman et al., 2011). In the end, what companies aim to achieve with digital transformation: agility, transparency, collaboration among teams, better relationship with customers and suppliers, etc. are precisely the kind of benefits that can be enabled by these information technology systems.

2.3. IT implementation and digital transformation in fashion firms

The next level of our theoretical framework, which brings us later to the point where this paper makes a contribution, is the area of research relating IT and the fashion industry. It is an area in which academic research is scarce, despite the importance it is gaining among practitioners of this industry in last years.

The adoption of this type of technology is usually associated to some particular business needs and challenges due to specific market circumstances. In the case of the fashion industry,

the reasons for implementing such technology are in most of the cases related to market pressure on supply chain management (Hui et al., 2010) mainly due to the spread of "quick response" and "fast fashion" business models. Thus, the ever-reducing time to market, the need for agility and flexibility and the need for sharing information in a global supply chain are some of the factors that have led fashion companies to start relying in information systems like SCM or ERP with functions such as materials management, production control, sales and finance (Forza and Vinelli, 1997; Hodge, 2002; Bertolini et al., 2004). Then, the tough market circumstances of last few years with the e-commerce adoption, the new customer habits and the social media impact, have pushed companies to integrate other information systems like CRMs in order to better manage customer relationship (Hui et al., 2010; Lo et al., 2008; Ko et al., 2008). And lately, other pressures coming from markets related to the final product, such as the demand of thousands of new products each season, the personalization and customization trend, the ethical and environmentally consciousness, etc., have started to encourage fashion companies towards the implementation of PLM systems (d'Amico et al., 2013; d'Aviolo et al., 2015; Vezzetti et al., 2015) in order to manage the entire lifecycle of products from its conception through the whole design and development process, tracking individual product information and allowing visibility and collaboration among the different actors involved. However, despite fashion companies are more and more interested in implementing this tool, little is known in the research literature of its implementation in the fashion industry (d'Aviolo et al., 2015). The way this industry is structured –by different product categories and different business models depending on their market positioning- make it hard to study the implementation of this technology as the requirements and benefits are not the same for every company. For instance, the advantages of using PLM for fast fashion companies may not be the same as the ones for companies in the luxury segment; meanwhile the first ones look for improving the time-to-market, the latter ones compete mainly on quality. And, the same happens for companies focused on different product categories; for example, the requirements of a PLM for apparel are not the same as for footwear or leather goods.

2.4. Contribution to the theoretical framework

In the global context of the digital transformation phenomenon, our paper aims to propose the use of PLM as a key enabler for fashion companies by sharing the case study of a small haute couture fashion house, which -with the support of a software firm- is implementing this tool. Therefore, taking as a reference the research framework (Figure 2), we are focusing on the "how" dimension of the digital transformation (right side of the framework) and more specifically on the firm-related variables. We analyze how these variables influence in this particular case and we identify new factors affecting the digital transformation process.

In this sense, while there are some contributions addressing the role of IT in fashion companies, the academic articles on digital transformation in this industry are scarce and thus our contribution could be significant both from the practical and academic point of view.

3. Case study research

For this paper, we have performed a case study research. In order to do so, we have adopted the case study methodology considerations (Yin, 1984; Miles and Huberman, 1994). The case study is a research methodology widely used and basically recommended to study phenomena that take place in rich contexts where there are always many variables to consider in comparison to the number of observations made. Accordingly, we consider this case study as an inductive one (Spens and Kovacs, 2006) whose main aim is to generate theory from a general framework (in this case, the one summarized in Figure 2). As it is developed in Ketokivi and Choi (2014), a typical case research incorporates both existing theories and empirical data to varying degrees, and they conclude by arguing that in the past 25 years there has been a "renaissance of case research" in organization research.

3.1. Background of the case study

The case study we present here is one of the initiatives born from the collaboration of two companies: Dassault Systèmes -an IT software and 3D technology company-, and the Haute Couture fashion house Julien Fournié S.A.S. Their relationship started in 2010, when Dassault Systèmes created the FashionLab, a technology incubator for fashion designers aiming to marry the engineering creativity of the software company with the artistic inventiveness and industry know-how of designers to build new and innovative solutions for the fashion and lifestyle industry.

Dassault Systèmes –founded in the 80s- is one of the leaders in its industry. With more than 13,000 employees around the world and more than €2,000billion of revenue, provides companies in 12 different industries with their software solutions ranging from 3D computer-aided design to Product Lifecycle Management (PLM) or high-end 3D visualization. Its vision is to help companies create sustainable innovation by transforming the way products are designed, produced and supported, enabling them to deliver excellent customer experiences. The company is also enabling the digital transformation of lot of industries providing them with the right tools and creating specific solutions, which take into account the pains and challenges and the different business processes of each industry. For instance, they deliver a PLM solution, which is adapted for each industry, thus being completely different for instance the PLM for the automotive industry from the one for the fashion industry. This company is widely known for its historical relationship with more mechanical and technical industries with a solid technological-

background; however, less than a decade ago, the company decided to also give response to less technological ones such as the fashion industry, which started to need solutions for better managing their business processes and their products lifecycle. Since then, other solutions have been developed to help companies of this industry transforming digitally while improving their business efficiency.

The other protagonist of the case study is the couturier Julien Fournié, who after having worked during a decade for some of the most prestigious luxury fashion houses, in 2009, decided to found his own eponymous fashion house. One year later, the *Chambre Syndicale de la Haute Couture* –the governing body of the French Haute Couture industry- admitted him as a guest member in the official calendar of the Paris Haute Couture fashion week, being since then part of the very exclusive list of designers starring this event. He is both the designer and the manager of his company what means that he does not only take design decisions concerning his collections but he also takes business decisions in terms of its business model and operations. Nevertheless, he does not work alone; he manages a small team that helps him with the different daily activities in the atelier. He carries out two main collections per year –spring/summer and autumn/winter- that he shows in the catwalks, with a smart mix of both ready-to-wear and haute couture pieces. Besides his extremely creative capacity and savoir-faire in the haute couture dimension, he is also a pioneer in innovation for fashion. He strongly believes fashion can leverage technology and he looks forward bridging the gap between these two different worlds, main reason why he loved the idea of partnering with Dassault Systèmes in order to push the limits of digital technology for the fashion industry.

Since the birth of their partnership, several projects have already been developed showing some of the benefits of using technology in this industry. They were focused on the use of 3D design software in the design and prototyping process of a footwear collection and a new line of accessories. The reduction of lead times needed for designing and creating the prototypes as well as the opportunity to test a wider variety of colors and styles that couldn't have been tested physically, were some of the resulting benefits of these projects. Now, the collaborative project in which they are immersed –the one chosen as case study- is centered on the use of another software, the Product Lifecycle Management (PLM). The aim is to see how this business collaborative platform conceived specifically for fashion companies -and already used by big fashion brands and retailers- can also help the Haute Couture business operations, identifying the relevant factors in the implementation as well as the benefits in the key areas of his business in order to settle the foundations of a sustainable digital transformation.

The case has been developed based on first-hand access to data and information thanks to the full-time participation of one of the authors in the project. Thus, all the information has been

gathered from interviews with the actors involved in the project as well as internal reports and field notes from the working sessions with the designer and his team.

3.2. Case study description

After having carried out the projects on 3D design and having experienced the advantages digital technologies could bring in the designing process, they decided to go one step further. In this project around the PLM solution, the aim is not to improve or add value to one specific activity but to provide a "digital continuity" throughout all the business processes around the full development of the designs and collections. The software aims to serve as a digital platform allowing the designer and his team managing key elements such as materials, suppliers, quotations or budget in an efficient way, improving the management of collections. With this platform all the information around every design will be archived digitally; in words of Julien Fournié: *"From design to manufacturing data, all information is saved in an online platform, centralized and collaborative. It is a unique source of information for my team and myself."*

This PLM software is already being used by several fast fashion brands and retailers, whose main challenge is to develop more and more collections per season in order to meet customers' needs, by competing in cost and time to market. This collaborative platform helps them to meet the market requirements improving the speed to market by 15% to 50%. Related to this, other important benefits these companies can obtain are that they can eliminate up to 75% of non-value-added time, they can generate direct product cost savings of 5-7% and they can streamline complex supply chains, improving visibility, flexibility and decision support at all levels of the company. However, with this collaborative project Dassault Systèmes aims to demonstrate that this technology tool can also be beneficial for the Haute Couture and high-end fashion designers, which compete in the high segment of fashion with values such as high quality and exclusive raw materials, the "savoir faire" and craftsmanship, and the quality and neatness of its designs. Together they will show that this tool is not at odds with luxury but the opposite, it seeks to protect the brand heritage and craftsmanship of the high-end fashion house. As Julien Fournié said: *"The idea is not to erase the craftsmen, it is just to accelerate the process between them and the studio."* In the end, in these high-end fashion companies, it is the product together with the designer's creativity that is in the center of everything; it is their main value proposition. Thus, this software that supports digitally the whole design and development process by managing efficiently all the important elements around it, may be a very suitable tool for them and its real benefits are aimed to be identified and showed in this project.

The project consisted of two main phases. The first one – the *preparation phase*- which could be divided into two stages: the *stage of familiarization and awareness* to ensure the designer understood the implications and challenges and that both companies were aligned; and then, the

stage of *business process analysis* in which the designer's business activities were analyzed and compared with the standard business processes already defined within the software. The second phase of the project was defined as the *execution or implementation phase* in which the PLM would be installed and used for the first time with the designer and his team throughout a whole collection. Both phases of preparation and execution were considered essential and equally important for the final success of the project, thus critical success factors could be identified from both of them. For this reason, although the project is still in the second phase, we found interesting to share in this paper some of the lessons and success factors identified so far in the first phase of the project.

Given the fact that it was the first Haute Couture house using this tool and that there were no previous examples of similar experiences, a special importance has been given to this first phase of *preparation*. We had to make sure, on the one hand, that the designer and his team understood the tool with its potential benefits and were aware of the possible changes to happen in their way of working; and, on the other hand, that we had well analyzed their business processes and we had identified the specific areas in which the tool could better help them. Therefore, with these goals in mind, both partners started to work together organizing working meetings in Julien Fournié's atelier. The first sessions were dedicated to explain to the designer and part of his team the characteristics of the software; we did a presentation of the capabilities and processes that were covered in the different modules of the PLM tool (collection planning and management, design and development, and sourcing and production) and we performed a live demonstration of the software letting them experience in first hand what they were eventually going to use. Then, the next meetings were focused on the analysis of the fashion house business processes. Julien Fournié explained in detail their business model, the way they are organized, the different roles and responsibilities of the team, the calendar with the critical dates for the collection development, and all the things that could be important for the business and should be taken into account. After that, we could do an assessment of the amount of time consumed in the different tasks carried out, as well as some of the "risks" they were running in different tasks, which could potentially make them lose money and efficiency if they were not well managed. It was at this point when we could start visualizing the potential benefits and positive impacts of the PLM implementation. Finally, taking advantage of a break we did due to the full-time dedication of Julien Fournié and his team to the upcoming fashion show, the FashionLab team carried out the second part of this phase of analysis. The goal was to organize the information and data collected and to analyze the possible alignment of the processes followed in the fashion house and the processes already defined in the PLM software solution. This also helped us to start preparing the next phase of the project: the execution phase with the software implementation in the atelier.

4. Findings and managerial implications

4.1. Findings from the case study

Taking as reference the general research framework (Figure 2), we are able to identify the specific context of this case study concerning "the why" and "the what", as well as to analyze and discuss "the how" dimension attending to the different variables that can influence the technology implementation process. In this way, the case used in this paper is an example of the digital transformation of a company enabled by a PLM solution (IT) –"the why"-, which will have a direct impact in the internal processes and operations –"the what". Regarding the firm-related variables, we are talking about a company in the *high-end segment of the fashion industry* where craftsmanship is an essential part of the value proposition and it is often at odds with technology. This is an inherent barrier in this industry and it has to be solved, as for instance in this case, by working hand in hand with the designers and showing them that the aim of the digital transformation is not to harm the essence of their job but to help them "in the backstage" operations. It is an industry in which technology is not usually welcomed and thus the challenge is bigger when trying to implement it. However, the position of this company in the value chain (*business to consumer*) means that there is more pressure for them to embrace technologies. Concerning our case, new generations of luxury customers are digital natives and don't see any "contradiction" on using technology to support the creation of high-end products, as they know that the main attributes that make this product especial remain intact. Young designers, like the protagonist of our case, are also aware of this and are more and more convinced of the benefits technology can bring to their businesses. Then, the fact that it is a *small company* –where both the creative and managerial minds are the same person- makes it much more easier; as seen in the case, decisions are made quickly giving lot of flexibility and agility to the technology implementation process. Finally, the last variable -related to employee's mindset and attitudes- is the one we found more relevant in this specific case and several factors (seen in figure 3) have been identified to be crucial in the PLM implementation process developed until now:

(1) *the motivation and buy-in of the key role (the designer and manager)* is something that has helped the running of this project from the very beginning; the keen interest shown and his belief in the potential benefits that the PLM would bring to his business will make possible the success of the project.

(2) *The partnership and relationship of trust*: the feeling of knowing that they are not alone in this endeavor and that a software company like Dassault Systèmes is supporting and guiding them is certainly a very positive factor too towards a sustainable digital transformation.

(3) *The well understanding of the tool and its implications:* we realized it was essential to explain and show them in a very easy and friendly way the software environment and its

capabilities, as well as ensuring the understanding of the things that would maybe be done differently in order to improve their efficiency.

And, finally, (4) *the high engagement of the employees in the full process*: the fact that the designer and his team have taken part in the project from the very beginning by letting them also make decisions and give their opinion, has helped to understand the importance of sharing with us all the internal processes of their business and demonstrating that their contribution to the technology implementation process is crucial.
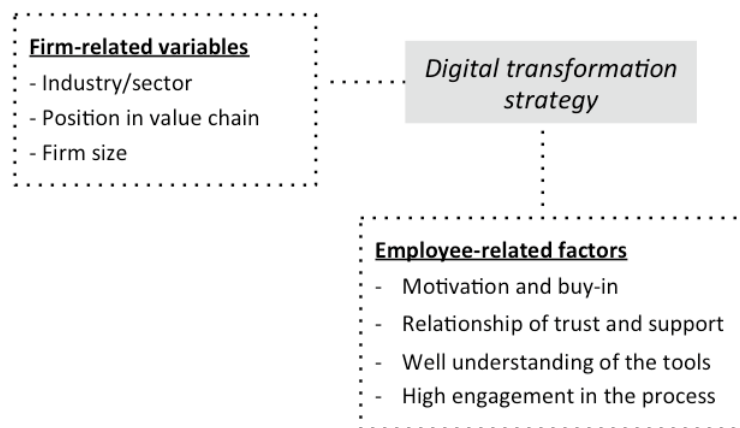

Fig. 3: Extended framework with key factors identified in the case

4.2. Managerial implications

From the case study discussed in this paper we can perfectly extract some useful and practical implications for practitioners involved in a process of a technology implementation either from the side of the client company or from the technology provider. This type of collaboration projects can be very effective in cases like this in which the client company is not technological by nature and lacks understanding of the capabilities it can bring. But it can be very convenient too for technology companies that need to adapt the existing tools to the real needs of this type of companies and must understand very well how they work. Therefore, for both sides, this way of working together based on the transfer of knowledge may lay the basis of a high value added customer-supplier relationship that can be very beneficial in the long term.

5. Conclusion

Technology is transforming every industry and the fashion industry is not immune to this trend. Thus, fashion companies are facing the huge challenge of implementing new technologies to drive their digital transformation. In order to understand the whole context of this phenomenon, a theoretical framework has been developed, which can be used as referential point when analyzing this issue in different cases. Then, aimed at exploring this digital transformation

challenge closely, we have conducted a case study of a high-end fashion house embedded in the implementation of a product lifecycle management (PLM) solution with the support of a software company. We have centered our attention in analyzing how the variables, previously identified in the theoretical framework, affected in this specific case, bringing us to an extension of the framework with several key factors identified in the case that directly influenced one of the most important variable: the one centered on employees' mindset and attitude. We have realized the tremendous importance of people's factors especially in the fashion industry, what leads us to conclude that a technology implementation and the digital transformation are not only about processes and technical points but also about human aspects like collaboration, trust and understanding.

6. Limitations and further research

Obviously, this work also has some limitations that require further research contributions. Our findings are based on a single case study and therefore any generalization of the results needs to be carefully considered. For instance, further research could investigate additional cases and thereby improve the robustness of our findings. Nevertheless, we believe that the richness of the details provided by our single case study makes this paper a valuable contribution to the theoretical framework on digital transformation, specifically in the fashion industry. Besides, a new research line of interest could be to analyze this case study in terms of supply chain and open innovation, linking two concepts whose similarities have already been discussed (Groen and Linton, 2010), but in the scope of information technologies and digital transformation.

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