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# Relevant Factors and Challenges when Implementing an Eco-Design Strategy in the Fashion Industry

## Factores Relevantes y Retos para Implementar una Estrategia de Ecodiseño en la Industria de la Moda

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### I. INTRODUCTION

In January 2012, the Ellen MacArthur Foundation published a report on the circular economy, which represented a milestone in the understanding of this concept. The aim of the circular economy is to maintain the usefulness of products, components and materials while retaining their value within the supply chain (Ellen MacArthur Foundation, 2023).

The circular economy “is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended” (European Parliament, 2023). Eco-design (or circular design) can be understood as design that integrates the principles of the circular economy. In other words, eco-design is a strategy for indefinitely prolonging the value of products by keeping them within a waste-free circuit.

As Niinimäki et al. (2020) argues, the global fashion industry is undergoing increasing scrutiny due to the profound environmental implications of its supply chain operations including excessive consumption of raw materials, energy and water, chemical pollution, greenhouse gas emissions, and unprecedented levels of textile waste. Fast fashion’s linear and extractive nature not only

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### **EXECUTIVE SUMMARY**

The aim is to identify and analyze factors influencing the successful implementation of eco-design strategies in the fashion industry. Using the case-study methodology, we analyzed secondary information and semi-structured interviews from two fashion firms: Mango and Bestseller. Internal factors, especially cultural aspects of the firm, internal collaboration, supplier involvement and innovation, are the most relevant for promoting eco-design strategies and they act as critical levers. External factors, such as legislation, cooperation with external agents and customers, play a relevant role but not to the same extent as internal factors. These findings permit to offer a new decision-making framework for managers to determine the eco-design strategy.

### **RESUMEN DEL ARTÍCULO**

El objetivo académico de este artículo es identificar y analizar los factores que influyen en la implementación de estrategias de ecodiseño en la industria de la moda. Utilizando la metodología de estudio de caso, se analizó información secundaria y entrevistas semiestructuradas de dos firmas de moda: Mango y Bestseller. Los factores internos, especialmente los aspectos culturales de la empresa, la colaboración interna, la implicación de los proveedores y la innovación, son los más relevantes para promover las estrategias de ecodiseño y actúan como palancas críticas. Los factores externos, como la legislación, la cooperación con agentes externos y los clientes, juegan un papel relevante, pero no en la misma medida que los factores internos. Con los resultados obtenidos, se ofrece un nuevo marco para la toma de decisiones para los directivos asociado a la estrategia de eco-diseño en empresas de moda.

undermines environmental integrity but also delays the adoption of circular and sustainable production practices. The authors advocate for a systemic transformation of the fashion value chain which involves a strategic deceleration of production processes, the integration of sustainable materials and practices, and a cultural shift toward extended garment lifespans and reduced consumption. In this context, the main aim of this study is to develop a decision-making framework that permits managers to identify the relevant factors influencing the successful implementation of eco-design strategies in the fashion industry.

This objective can be summarized in the following research question (RQ): What are the most relevant factors that influence eco-design strategies in the fashion industry?

To answer this research question, we carried out a narrative literature review to derive a preliminary taxonomy of factors that may influence eco-design in the fashion industry. We then used the case-study methodology to explore the experiences of two fashion firms developing eco-design strategies: Mango and Bestseller.

This study allows us to identify managerial and social implications that we consider crucial for promoting eco-design in firms in the fashion industry.

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*The aim of the circular economy is to maintain the usefulness of products, components and materials while retaining their value within the supply chain...*

## 2. BACKGROUND: ECO-DESIGN IN FASHION INDUSTRY

This study aims to explore the internal and external factors influencing the successful implementation of eco-design strategies in the fashion industry. It is theoretically grounded in the Natural-Resource-Based View (NRBV) of the firm (Hart, 1995; Hart and Dowell, 2011), which extends the traditional Resource-Based View (RBV) by emphasizing environmental sustainability as a source of competitive advantage. According to the NRBV, firms can develop strategic capabilities that enable them to respond proactively to environmental challenges.

### 2.1. Perspectives of Eco-Design Concept

In the highly resource-intensive fashion industry, eco-design can be considered a key capability, allowing firms to reduce environmental impacts while enhancing innovation and brand differentiation. In

terms of defining the scope of eco-design, we find three perspectives on this concept. The first is linked to environmental management systems (EMS), where eco-design appears as an element for assessing quality certificates (Lewandowska and Matuszak-Flejszman, 2014) The second perspective is based on defining all of the activities that eco-design includes (Zailani et al., 2012): (a) designing to reduce or eliminate environmentally hazardous materials (such as lead, mercury, chromium and cadmium), (b) designing for reuse, which facilitates the reuse of a product or part of it, with no or minimal treatment of the used product, (c) designing for recycling, which facilitates disassembly of the waste product, the separation of parts according to material and the reprocessing of the material, (d) designing for remanufacturing, or repair, rework, and refurbishment activities that attempt to return the product to new or better-than-new condition, and (e) designing for resource efficiency, which reduces consumption of materials and energy during product use, and promotes the use of renewable resources and energy.

Finally, we can include the practical perspective on eco-design, which highlights several concepts relevant to the aim of our study, such as a “dynamic process,” “stakeholder demands,” “full product life cycle,” “innovative practices,” and “social and ethical aspects” (Li and Sarkis, 2021).

Through a narrative literature review, we identified several papers published in academic journals that specifically analyze eco-design in the context of the fashion industry.

First, from our examination of these studies, we identified three points of view on eco-design analysis:

- 1) **Performance:** Srisawat and Srisawat (2020), Zhang et al. (2013) and Kalyar et al. (2020) focus on the impact of eco-design on sustainability and financial indicators. They highlight the positive effect on the former, but they find few effects on the latter.
- 2) **Product features:** Wagner et al. (2019) and Wang and Shen (2017) emphasize the eco-fashion concept and the predominance of functionality over aesthetics, respectively. Benkirane et al. (2022) conclude that a suitable decision-support system for eco-design in the textile industry must take consumer needs and practices into consideration when designing for longevity.

#### KEYWORDS

Eco-design strategy;  
Circular economy;  
Fashion industry.

#### PALABRAS CLAVE

Estrategia de  
ecodiseño; Economía  
circular; Industria de  
la moda.

**3) Eco-design practices:** Riemens et al. (2021) find a lack of eco-design practices. These authors suggest that eco-design must be addressed as a thought-confronting process that includes the entire value chain, and considers both durability and recyclability, which can conflict in practice. Franco (2017) analyzes eco-design as a circular-economy practice.

Second, we concluded that eco-design in the fashion industry is not a topic that has been extensively treated acknowledging that empirical evidence in this area is still limited and scattered.

Third, although the existing and still scarce studies on eco-design in the fashion industry have employed a variety of methodologies (e.g., case studies, Delphi methods, and surveys), none have specifically examined the key factors that explain firms' commitment to eco-design, particularly from a business and organizational perspective. In this regard, we argue that the objectives and research question of our study are original, as they not only address an important gap in the literature but also contribute to a deeper understanding of how eco-design can be strategically integrated into fashion industry practices.

## 2.2. Taxonomy of Internal and External Factors Influencing Successful Eco-Design Strategies

We first focus on those studies that analyze eco-design but, as the extant literature about eco-design is very limited, we also consider those studies that analyze factors related to the circular economy in the fashion industry.

Some of the analyzed studies offer systematic literature reviews but most of them are based on case studies. Ostermann et al. (2021) classify factors influencing the circular economy into internal and external categories, providing a framework that allows us to distinguish between those factors that firms can monitor and those shaped by the context and environment. Fernández et al. (2024) identify, within the field of the circular economy, areas of opportunities, strategic orientations and advances in knowledge for food sustainability. The results show exponential growth, but they do not refer to the concept of eco-design.

With respect to internal factors, we identified, first, factors more oriented towards company values. The need for an ethical code



of conduct in the company was cited by Li and Sarkis (2021) when defining eco-design. A culture oriented towards innovation is also a relevant factor, as suggested by Jaeger and Upadhyay (2020) and Ostermann et al. (2021). The role of leadership and commitment from top management are relevant drivers, especially in family firms (Jia et al., 2020; Moktadir et al., 2018; Ostermann et al., 2021; Sandvik and Stubbs, 2019). With respect to defining a sustainability plan, Ki et al. (2020) highlight the need of establishing a strategic direction of circular fashion, where both internal and external stakeholders have a relevant role. Kalyar et al. (2020) identify eco-design as a green supply chain management practice and focus on environmental and financial indicators. Franco (2017) and Colucci and Vecchi (2020) suggest analyzing the entire textile value chain from product design to take-back and reprocessing, as each part is crucial for expediting or delaying a firm's aspirations to develop a circular product and, consequently, an eco-design collection. Financial resources availability is also an internal factor cited, for instance, in Ki et al. (2020) and Gil-Lamata and Latorre-Rodríguez (2023). Also, Ki et al. (2020, p. 2414) "includes lack of reliable information, skills, or know-how related to creating circular fashion" as an internal factor, which is also emphasized in Galatti and Baroque-Ramos (2022). Finally, the potential to improve performance indicators is a relevant factor (Jaeger and Upadhyay, 2020).

Related to external factors, legislation and pressure from competitors and the community are factors that appear in numerous studies. For example, Jia et al. (2020) highlight that governments can enforce legislation relating to recycling, remanufacturing and packaging. In this sense, recycling and the reuse of ingredients and packaging are part of the circular economy on which governmental support and regulation are focused. Fischer and Pascucci (2017) describe institutional incentives in the circular economy transition. Technological advances are also crucial for the development of eco-design strategies. In this regard, Nascimento et al. (2019) explore how technologies emerging from Industry 4.0 can be integrated with circular-economy practices to establish a business model that reuses and recycles waste materials, such as scrap metal or e-waste. Benkirane et al. (2022) develop a longevity



design methodology based on eco-design and consumer-oriented quality for fashion products, which shows the relationship between the external factors of customers and technology. With respect to reverse logistics and infrastructure, Abdelmeguid et al. (2022) and Gil-Lamata and Latorre-Rodríguez (2023) include this factor as relevant for sustainability. Finally, Abdelmeguid et al. (2022) signal the relevance of stakeholders to integrate circular economy in the business strategy.

**Table 1. Internal and external factors influencing eco-design strategies in the fashion industry**

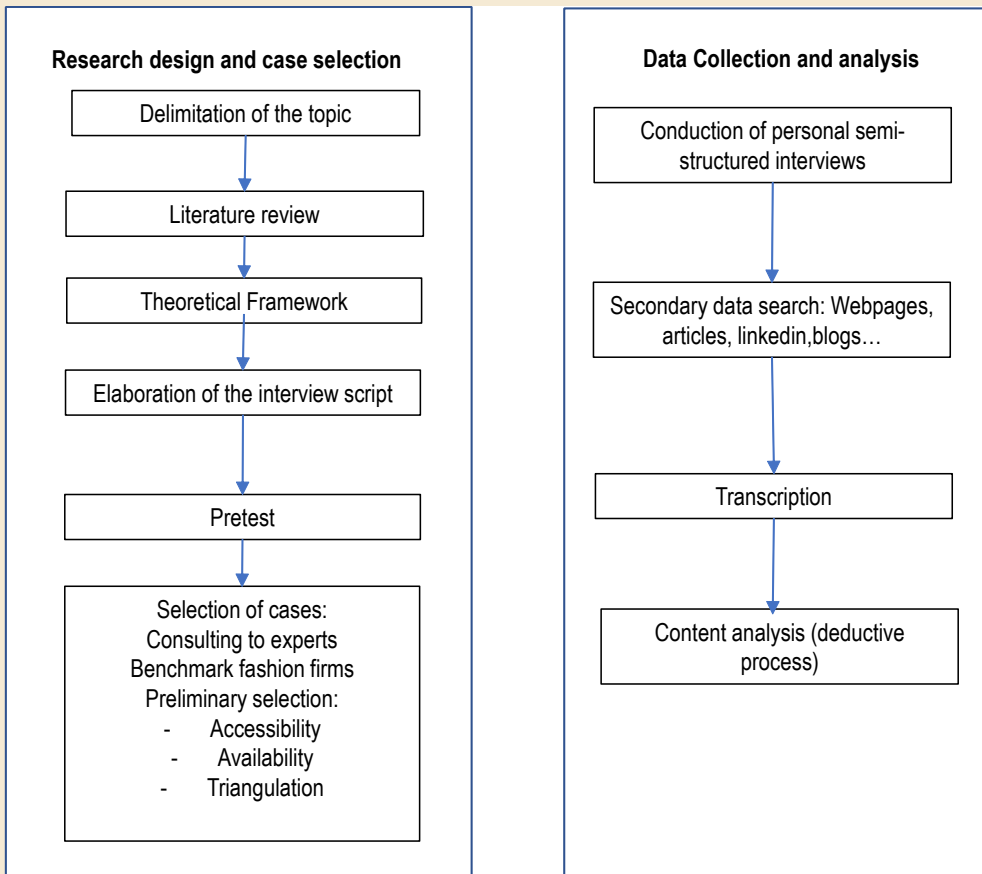
INTERNAL FACTORS
An ethical code of conduct
An innovative-oriented company culture
The commitment and leadership of the management team
Development of a strategic sustainability plan
Financial resources available to support investments associated with an eco-design strategy
Internal know-how on product and process design
Potential to improve performance indicators
EXTERNAL FACTORS
Legislation
Pressure from society and competitors
Customer pressure to incorporate eco-design and attitudes at different stages of the process
Technological innovations in recyclable materials
Development of technology for the recycling process
Infrastructure and reverse logistics adequate for the collection of final products
Support from stakeholders (e.g., suppliers of sustainable materials, customers who value eco-design)

**3. METHODOLOGY**

The main focus of this study is to address the research question we propose and to provide insights and guidance for future research. In this sense, a qualitative approach, based on case study methodology, has been employed. This approach is especially useful to address how and why questions in a real-world context. To answer our research question and achieve our objectives, we undertook two case studies (Mango and Bestseller) that provide

evidence about the factors that influence the success of eco-design strategies in the fashion industry and the challenges faced by firms in this sector. Following **Figure 1**, we summarize the research steps.

Figure 1. **Summary of research steps**



### 3.1. Research Design and Case Selection

Once we build the theoretical framework, we elaborate the interview script.

Based on the findings of the literature review, we developed a questionnaire with both open- and closed-ended questions to allow for semi-structured interviews.

We ran a pre-test of the preliminary version of the questionnaire with two academics and one professional specialized in sustainability topics in the fashion industry. This permitted us to obtain relevant

comments and suggestions for improving comprehension of the questions.

In order to select the case studies, the researchers contacted fashion firms that they knew or that responded when approached via LinkedIn. When selecting our case companies, we looked for all of the following: the possibility to interview managers of sustainability departments; firms with different features in order to allow for extrapolation of the findings to the rest of the fashion industry; and firms that set a reference standard in their respective markets. In addition, we considered whether the case companies could provide us with enough information to answer our research question.

Mango ([www.mangofashiongroup.com/](http://www.mangofashiongroup.com/)) is one of Europe's leading fashion groups. Rodriguez-Donaire et al. (2009) analyze the origins, strategic evolution, and organizational structure of this company founded in Barcelona in 1984. It is a global company with design, creativity and technology at the center of its business model, and a strategy based on constant innovation, the search for sustainability and a complete ecosystem of channels and partners. Mango understands sustainability as a journey the fashion industry has to make in order to achieve a more just society, and to reduce its environmental and social impact. In 2002, the company became a pioneer in the sector by creating a sustainability department, which since then has been responsible for establishing Mango's sustainability roadmap.

In late 2022, the company presented its new sustainability strategy with the horizon of 2030, focusing on new goals and stricter measuring systems in line with key and stricter market standards. The new road map, called Sustainable Vision 2030, was established to reduce the environmental and social impact and it is based on three key pillars: committed to product, committed to planet and committed to people, each one of which establishes specific goals and projects to be achieved.

Bestseller (<https://bestseller.com/>) is an international, family-owned fashion company that has been active in the European wholesale and retail business for almost 50 years. The company operates from its headquarters in Denmark and has a range of around 20 fashion brands including Jack & Jones, Only, and Vero Moda. Its clothes and accessories cater to women, men, teenagers, and children, and are sold in more than 70 markets across Europe, Asia, North America, South America and the Middle East, as well



as globally through e-commerce platforms. Bestseller's Fashion FWD strategy outlines the company's sustainability ambitions and actions, and defines how it strives to increase the transparency and traceability of its products and materials, preserve the climate and environment, motivate and support people, stimulate innovation, and cooperate throughout the fashion industry.

### 3.2. Data Collection

The selection of interviewees was based on preliminary contacts with those responsible for sustainability in both firms. After explaining the aims of our research, we agreed to interview the sustainability managers of each firm. In Mango, we interviewed two people, as the responsibilities for eco-design are shared by two departments: Environment and Circularity. **Table 2** provides details on the interviewees.



Table 2. Interviewees' profiles

FIRM	DEPARTMENT	PROFILE
Mango	Head of Circularity	<ul style="list-style-type: none"> <li>Professional (industrial engineer) with more than 11 years of experience in the company</li> <li>3.5 years in current position</li> </ul>
Mango	Head of Environment	<ul style="list-style-type: none"> <li>Studies in environmental sciences and corporate social responsibility</li> <li>Six months with Mango and seven years in the fashion industry</li> </ul>
Bestseller	Head of Sustainability	<ul style="list-style-type: none"> <li>Business education</li> <li>Active in the textiles sector since 1996</li> <li>Started in product sourcing and product development: collection development, price establishment, etc. together with global supply chain</li> <li>Transitioned into sustainability leadership</li> </ul>

We are conscious that a methodological limitation that should be acknowledged is the profile of the interviewees. Since the interviews focus solely on sustainability or environmental managers, there is a risk of bias, as design departments or logistics are not represented. We have tried to avoid this by emphasizing in the interviews how the different departments and the firm visualize the concept of eco-design.

The interviews, which lasted an average of 2.5 hours, were carried out by the three members of the research team in order to allow

for comparisons of data, notes, reflections and perspectives. Data collection occurred in June and July 2023. During this period, the interviews were transcribed and analyzed from a word file with content analysis. In this sense, team members had different but complementary insights, which added value to the data. The findings were sent to each of the two firms analyzed to obtain their feedback and approval of the sections explicitly related to their firm. Thus, the two case studies meet the requirements for internal validity, external validity and reliability set out in Yin (2009) through the criteria to select the cases, a questionnaire based on a theoretical framework, a pretest, internal validity of interviews, transcription and content analysis. Additionally, as a secondary data sources, we considered newspaper articles in which Mango's or Bestseller's managers were interviewed or quoted, and in which they explained their firms' commitment to sustainability.

4. FINDINGS AND DISCUSSION

In this section we summarize the interviewees' perceptions for each analyzed internal and external factor in **Table 3** and subsections 4.1 and 4.2. While for most of the factors these perceptions are similar for the two companies analyzed, some differences emerge in how they approach them in terms of the implementation of eco-design (right column **table 3** and section 4.3). We also relate our findings with previous research. In this way, we extend the theoretical framework and highlight our contribution to eco-design literature.

Table 3. Main findings about the case-study firms' perceptions of internal and external factors

INTERNAL FACTORS	PERCEPTIONS OF INTERVIEWEES	CROSS-CASE COMPARISON
An ethical code of conduct in the company	Low influence	Mango's is more focused on labor conditions and conduct and Bestseller more on ethical sourcing
An innovative-oriented company culture	Crucial for developing eco-design practices; particularly relevant for employees and to promote open-innovation practices	Mango promotes innovation through formal programs (e.g. StartUp Studio) and Bestseller emphasizes more open innovation following a family-driven ethos of shared learning
Commitment and leadership of the management team	Highly relevant; the development of tools to ensure commitment and leadership is crucial (e.g. sustainability committee; supplier certifications; searches for new ideas)	While Mango has a strong formal leadership via its sustainability committee, Bestsellers vision is based more on the ownership values and culture

Development of a strategic sustainability plan	Crucial to link strategy and flexibility to allow for the development of eco-design practices	Mango has a roadmap (Vision 2030) with goals, metrics, and internal alignment and Bestseller's FWD is a flexible long-term strategy without rigid timelines
Financial resources available to support investments associated with an eco-design strategy	Highly relevant and it is considered as a requirement to develop an eco-design strategy	Investments in R&D and pilots at Mango and long-term funding by the family at Bestseller are the enablers
Internal know-how on product and process design/ training of workers for sustainability	Very important but integrated into the firm's culture	Mango relies more on technical expertise and structured sustainability training and Bestseller comparatively more on learning-by-doing
Possibility to improve performance indicators	Relevant but must be mindful of intangible aspects that influence sustainable practices and key performance indicators (KPIs) – impossible to achieve all of them	Similar orientation on long-term brand value and stakeholder impact
<b>EXTERNAL FACTORS</b>		
Legislation	Highly relevant but not the engine for developing eco-designed products	Both closely monitor EU directives, but try to anticipate being proactive, especially Bestseller
Pressure from society and competitors	Relevant but not enough if internal motivation is lacking	Both engage in sector alliances, primarily driven by internal motivations
Customer involvement	Customers' different attitudes towards sustainability serve as relevant drivers	Similar encouraging engagement, for example through education
Technological innovations in recyclable materials and recycling processes	Highly relevant; there is a need to develop external networks for collaboration	Both drive innovation primarily through supply chain innovation
Infrastructure and reverse logistics	Need for flexibility but not viewed as highly relevant	Both rely on third-party systems for end-of-life product handling
Support from stakeholders	Highly relevant	Both seek strategic collaborations with suppliers, NGOs and peers

### 4.1. Analysis of Internal Factors in the Analyzed Case Studies

First, we analyze the perception of Mango and Bestseller regarding the internal factors influencing the eco-design strategy and also, we compare the findings with the existing literature.

#### ***An ethical code of conduct in the company***

Interviewees point out that the existence of an ethical code in the company was not relevant for promoting eco-design, as such codes focused more on employees' behaviors than on the firm's activities. Instead, interviewees emphasized the relevance of being members of ETI Ethical Trading, an initiative that looked at social and ethical

standards, which allowed the companies to work on due diligence in their supply chains. Both firms highlighted that the way to empower workers was to involve them more in sustainability practices and eco-design. For example, the interviewee from Bestseller stated that “there are minimum wages in countries and things we need to comply with, but there is also a great deal of focus on how you can bring the worker's voice into the conversation and bring the employers to the table. That goes hand in hand with purchasing practices”. Just only Li and Sarkis (2021) signal the relevance of ethical aspects, but it does not give any contribution in terms of empirical findings. In this sense, the fact that ethical code appears to be a factor with low influence fit with the fact that it has not been studied in the eco-design research.

#### ***An innovative-oriented company culture***

Both firms viewed an innovative-oriented company culture as crucial. More specifically, the interviewees highlighted some initiatives that showed the relevance of a culture of innovation. Mango launched StartUp Studio, which aimed to promote the creation of startups and develop new business models that could change the industry. In this regard, Mango provided resources, knowledge and experience to support value-generating proposals in the sector. The aim was to encourage the development of innovative ideas and ground-breaking concepts and, thereby, generate a positive impact on the fashion industry's value chain. The Bestseller interviewee indicated that the firm was innovative-oriented in two ways: the continuous training of employees and open-innovation practices with the right partners. In this sense, eco-design literature cites culture as a relevant factor, but in those studies that is signaled (Jaeger and Upadhyay, 2020, and Ostermann et al., 2021) do not give any activity to promote a culture of eco-design in the firm, as we describe for both Mango and Bestseller.

#### ***Commitment and leadership of the management team***

The commitment and leadership of the managers was viewed as essential for the successful implementation of eco-design in both firms. Mango had a sustainability committee that was essential for making certain decisions, and that committee included a



representative from each of the product lines. The committee met once per month and had a dual function. On the one hand, it was in charge of monitoring and supervising all initiatives launched by the sustainability teams, which were closely related to products. On the other hand, it served the circularity department as an agile tool for launching small or large projects within the group (i.e. it had a more operating function). For Bestseller, the company's leadership commitment to sustainability was crucial. This company had a global view and looked for an impact in all dimensions of sustainability. This made some aspects of eco-design particularly important, such as supplier certification and the search for better materials with a proven lower impact. This commitment was also expressed in incentives to develop internal and external ideas for new practices. One pillar of Bestseller's approach was the focus on the entire supply chain when developing eco-design practices. In terms of previous literature, there are many references that signal commitment and leadership, but only Moktadir et al. (2018) develop this factor in a detailed way. Comparing both studies, ours highlight the needs of a sustainability committee that manages the transversality of eco-design.



### ***Development of a strategic sustainability plan***

For Mango, the development of a strategic sustainability plan laid the foundation for the definition of the objectives and for the product teams to work towards those objectives. The strategic sustainability plan set out the main lines of action and served as a guide for, for instance, the product teams, designers and buyers involved in the day-to-day management of the products. Sometimes it can be very challenging for the product teams, designers and buyers involved with the product to continually improve season after season. Bestseller had worked with sustainability for many years. Initially, the company emphasized the social dimension of sustainability more than the environmental aspects. However, at the time of our study, the environmental dimension was also a priority, especially with regard to the products. However, the social dimension was still an important part, and the social and environmental dimensions were closely connected. All interviewees agree that having a sustainability strategy was crucial for eco-design practices and their

integration into the firm. At the same time, having such a strategy isn't at odds with giving the different departments flexibility when putting the strategy into practice. Previous literature signals the need of defining a sustainability plan (Ki et al., 2020; Abdelmeguid, et al., 2022), but they focus more on the role of stakeholders and not so much the process, as we describe for the cases of the analyzed firms.

***Financial resources available to support investments associated with an eco-design strategy***

In both firms, the development of technologies for recycling and new materials was crucial. At the same time, the firms were conscious of the need to be financially sustainable. In this regard, the financial factors were viewed as less relevant for the successful implementation of eco-design strategies than those factors related to culture and commitment. However, as one of the Mango interviewees stated: "The company's commitment to innovation and sustainability goes hand in hand with the availability of resources to support and promote initiatives that are in the development phases and have low scalability at the moment but that could be key accelerators of the eco-design strategy in the future". In terms of the theoretical framework, financial resources availability is signaled (Ki et al., 2020), but it is not emphasized, as in the analyzed cases, that factor can be considered as a constraint but not so much a driver.

***Internal know-how on product and process design***

Both firms emphasized the need for high-level knowledge of fibers, raw materials and durability in order to develop eco-design products. They also stressed that training the company's professionals in sustainability was key for promoting eco-design. Despite their technical qualifications, many of the company's professionals (e.g. design technicians, purchasing managers, pattern technicians) likely had no formal training related to sustainability, as this subject was only incorporated more recently into formal education. Therefore, both firms highlighted the need for training to improve relevant the know-how. Moreover, while internal know-how was viewed as important, it was crucial that the initiatives were based on the company's culture and its commitment to sustainability. In



terms of similar findings in previous literature, Galetti and Baraque-Ramos (2022) signaled that sharing and developing knowledge are crucial to promote circular economy. Our case study contributes the emphasis on training to incorporate knowledge and to transform it into know-how.

### ***Possibility to improve performance indicators***

Performance indicators are crucial. However, one interviewee stated: “It is not about selling more or obtaining a higher margin but about improving customer satisfaction and customer loyalty. Eco-design collections, and the use of more sustainable raw materials or production processes and technologies do not necessarily lead to more sales and market-share increases. However, the company may lose customers if it does not use eco-design”. As such, the interviewees from both firms stressed that certain performance indicators act in different ways when developing environmental practices, such as eco-design. Our findings complement the ones of Gil-Lamata and Latorre-Rodríguez (2023) as improving economic performance is crucial to develop circular economy strategies, and, in this way, eco-design ones.



## **4.2. Analysis of External Factors**

Second, we analyze the firms’ perceptions of the external factors influencing the eco-design strategy. It is relevant to emphasize that external factors have been much analyzed in the literature of eco-design and circular economy.

### ***Legislation***

The interviewees were aware of the demands that European sustainability legislation would place on the textile industry. In general, concern and uncertainty about how to respond to the European directive on the extended responsibility of textiles were evident. There was also concern about the lack of harmonization between countries. However, the interviewees also stressed the fact that legislation could not be the main factor in promoting an eco-design strategy if not the internal factors, such as culture and leadership. In this sense, the analyzed papers in the review give a special relevance to legislation, such as Jia et al. (2020) and Fischer

and Pascucci (2017). Our findings show that for the analyzed case studies, the legislation is a very relevant factor, but if it represents the main one to promote eco-design will never become a cultural element of the firm.

### ***Pressure from society and competitors***

Both firms believed in the need to collaborate with external agents to advance in the sustainability area. They highlighted initiatives in this regard, such as Association for the Collective Management of Textile Waste in Spain (<https://www.culturaydeporte.gob.es/mtraje/en/museo/prensa/notas-de-prensa/np-historico/2023/asociacion.html>) –an example of co-petition in which durability of clothes is the key element of study. At the same time, they highlighted that pressure from society and competitors was a lever for advancement, but it was not enough unless accompanied by internal, proactive behavior. This factor represents a relevant contribution to the research, as the collaboration with competitors is not as highlighted as the one with other stakeholders (Gil-Lamata and Torres-Rodríguez, 2023).

### ***Customer pressure to incorporate eco-design at different stages of the process***

The interviewees emphasized the relevance of customer involvement and attitude. At the same time, they indicated that attitudes toward sustainability differed among customers and that identifying those that were more proactive was crucial for advancing different stages of the process. Therefore, this can be considered an important factor as long as we acknowledge that in practice there is still a long way to go in regard of consumers' sensitivity towards sustainability. In literature, this factor appears as both a driver and a barrier (Gil-Lamata and Latorre-Rodríguez, 2023), in terms of having or not pressure. In the European context, this pressure is very relevant, as the interviewees also signal, which may have an effect on price (Ki et al, 2020).

### ***Technological innovations in recyclable materials and recycling processes***

Technological innovations in both recyclable materials and recycling process were considered critical by Mango's and Bestseller's



interviewees. Some examples include the technology related to replacing conventional fibers with lower-impact ones. For instance, Mango launched a project with a supplier who made acoustic ceiling panels with polyester fiber. Together, they initiated a recycling project in which they separated out 100% polyester garments. In this regard, concepts like “emotional durability” have a relevant impact, and there is a need to keep advancing in technology and reinforcing external collaborations. These findings complement other studies (Nascimento et al., 2019 or Benkirane et al., 2022) where collaboration plays a key role to promote technological innovations in circular economy.

***Infrastructure and reverse logistics adequate for the collection of final products***

This factor was not viewed as relevant. The fact that logistics did not lie within the scope of interviewees’ responsibilities might have influenced this perception, however. The need for flexibility in logistics was in fact considered important, not necessarily in terms of eco-design but as an influential factor in decisions on facility locations. This is consistent with previous literature, in which reverse logistics is considered a topic of equal importance to eco-design (Abdelmeguid et al., 2022).

***Support from stakeholders***

The interviewees felt stakeholder support was critical, but they linked it to the need for external collaboration to develop new materials, technology or networks that could help the companies move ahead. They indicated that a wide range of stakeholders (e.g. suppliers, competitors, customers, logistics providers, non-governmental organizations, public ones) played a key role in promoting eco-design in the organizations. Our findings complement the ones of Abdelmeguid et al. (2022), which concluded that “internal stakeholders may plan circular fashion strategies concerning the product design, product value, collaboration, and operation, whereas external stakeholders are recommended to make strategic planning related to the technology and social aspects of circular fashion.”



### 4.3. Cross-case Comparison

Both Mango and Bestseller have made eco-design a strategic priority and, in both cases, internal factors as leadership, innovation culture, and internal know-how, are the primary drivers and considered more critical than external pressures like regulation or consumer demand. This aligns with prior studies (e.g. Ostermann et al., 2021; Jia et al., 2020).

But then -as advanced in **Table 3**- there are some differences in how they approach eco-design more in detail regarding the different factors. These differences are largely explained by their corporate cultures, organizational models, and market strategies. Mango, as a corporate-managed single-brand retailer, has formalized its efforts through structured programs, a dedicated sustainability committee, and a long-term roadmap (Vision 2030). Bestseller, by contrast, is managed more as a family-owned company and manages a portfolio of brands; its approach is more integrated into the company culture and driven by values, with open innovation and supply chain collaboration playing a central role. Notably, both firms invest in training and coordination across departments to embed eco-design and use long-term vision rather than short-term financial metrics to guide sustainability efforts. But while Mango coordinates efforts through a corporate committee, Bestseller achieves integration by embedding sustainability responsibilities into various roles across departments.

Overall, Mango leans comparatively more on governance structures and strategic planning to manage eco-design, while Bestseller achieves similar objectives through decentralization and stakeholder collaboration.

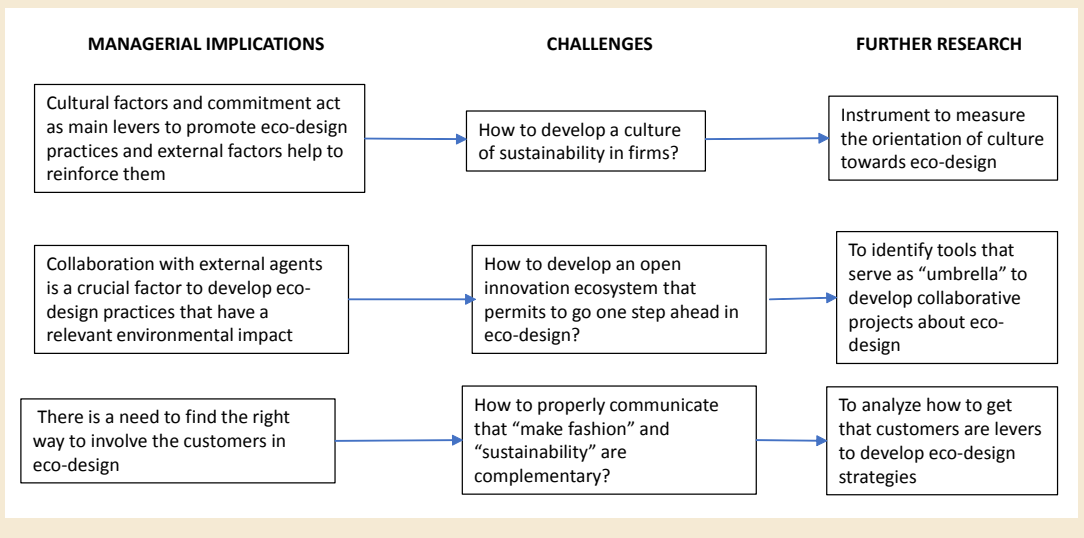
## 5. THEORETICAL AND MANAGERIAL IMPLICATIONS, CHALLENGES AND FUTURE RESEARCH

On the one hand, by examining both internal and external factors influencing the successful implementation of eco-design strategies in the fashion industry, this study positions eco-design as a strategic response aligned with the Natural-Resource-Based View (NRBV), highlighting how environmental capabilities contribute to long-term competitiveness in a sustainability-driven global market.



On the other hand, **Figure 2** shows the main managerial and social implications we view as crucial for promoting eco-design in firms. The first managerial implication is that cultural factors and the commitment of top management are the main levers for promoting eco-design practices. Especially, coordination relies heavily on the support and commitment of top management. To the extent that people know that their managers want them to act or move in a particular way, it is easier to get them to act as desired. The commitment of senior management, and the development of a strategic sustainability plan serve as the basis for the necessary coordination among the departments. Environmental and social issues must be linked in the sustainability strategy.

Figure 2. Managerial implications and challenges of eco-design in fashion firms



In this sense, the sustainability area is managed by product managers who are responsible for setting and managing the circularity objectives, and for promoting projects in collaboration with other areas or departments. Therefore, coordination among departments and team training are key. In this regard, firms face two main challenges: determining whether there is an eco-design culture in the firm and determining how to move ahead. As such, future research could focus on developing tools for analyzing the extent to which the organizational culture is oriented towards eco-design.

The second managerial implication is that collaboration with external agents is crucial for developing eco-design practices that have a relevant environmental impact. In this sense, the importance of collaboration along the supply chain must be reinforced. The main challenge in this regard is developing an open-innovation ecosystem that allows for activities oriented toward the development of eco-design practices. In future research, we suggest identifying tools for managing collaboration practices. Some examples could be to promote the use of an action research project, the development of platforms to share ideas or the building of networks based on designing research projects.

Third, customers should be in focus as key promoters of eco-design products. The interviews show that in general customers aren't yet that sensitive to sustainability when buying fashion products. This crucial managerial implication is associated with the challenge of properly communicating that "being fashionable" and "sustainable" are not at odds but complementary. One research topic along these lines could focus on the idea that customers can be levers for developing eco-design strategies.

A possible extension of this research would involve conducting studies using quantitative tools, such as surveys or key performance indicators (KPIs). The development of cross-country studies and the analysis of companies with different features could also contribute to the generalization of the findings. Additionally, specific theoretical and methodological approaches are suggested, such as the use of longitudinal designs to track the adoption of eco-design, the application of mixed-methods approaches (qualitative and quantitative) or the exploration of the role of digital tools in facilitating collaboration on eco-design.



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