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Federico Caniato, Luca Crippa, Margherita Pero,
Andrea Sianesi, Gianluca Spina

* corresponding author Email:
margherita.pero@polimi.it

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Internationalization and outsourcing of operations and product development in the fashion industry

Federico Caniato, Luca Crippa, Margherita Pero,
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This paper investigates the choices in terms of internationalization and outsourcing of operations and product development activities, as well as collaboration practices used within and across organisations, in different segments of the European fashion industry. Based on multiple, in depth case studies from Italy, Germany and the UK, the paper shows that fashion companies adopt different configurations of operations and product development, i.e., integrated, collaborative and virtual, ranging from local-integrated models to global-full outsourcing of operations and product development activities. For each configuration, different collaboration practices are in use. Product line positioning and quality, firm size, sales volumes and technical complexity of the products are the key drivers determining the configuration choices and the adoption of certain collaboration practices.

Keywords: fashion, supply chain management, product development, collaboration, internationalization

1. Introduction

Fashion products are characterised by an element of style that is likely to be short-lived. Therefore, firms in fashion markets should be able to manage short product life cycles, the high volatility and low predictability of product demand, and high-impulse purchases (Bruce and Daly, 2011; Christopher and Peck., 1997). These features represent major challenges for supply chain managers.

Since the last decade, important phenomena, such as the removal of the multi-fibre agreement in 2005, the economic crisis of 2008, and the saturation of the mature and traditional markets (Keenan et al., 2004; MacCarthy and Jayarathne, 2009), have strongly modified the traditional models of the industry, making, among the others, the fashion industry redesign its supply chain and increase its level of internationalization (Gereffi and Frederick, 2010).

When dealing with internationalization, an important difference exists between placing a business activity offshore in the hands of unrelated suppliers and creating the firm's own branch offshore. This distinction is stated very clearly in Kotabe and Mudambi (2009) for production activities, and similarly for product development activities in Eppinger and Chitkara (2009). Therefore, in this paper, we will consider both outsourcing and internationalization dimensions and, in line with Eppinger and Chitkara (2009), we will assume that they are independent.

Internationalization, in fashion industry like in other industries, has affected both supply chains and design chains, i.e. the set of actors involved in the product development process, by leading to the emergence of global supply and design chains (Eppinger and Chitkara, 2009) Thus influencing both supply chain management (SCM), i.e. source (Tokatli et al., 2008), make (MacCarthy and Jayarathne, 2009), and deliver (Sandhya and Giriia, 2009), and product development (Graafland, 2002) processes. Assuring alignment between SCM and product development processes is fundamental to increase company's performance (Pero et al., 2010) and requires companies to choose suitable practices (Caridi et al., 2012). The work by Khan et al. (2008) outlines how important it is to coordinate the work of designers and supply chain managers in the fashion industry. Reaching SCM-product development

alignment is a challenging task for managers, however little is known on how to do it when internationalization and outsourcing is at stake. Therefore the objective of this paper is to fill this gap in the literature, by focusing on the fashion industry.

To this end, this paper aims to: (i) analyse internationalization and outsourcing decisions in terms of operations and product development activities by differently sized companies belonging to different segments of the fashion industry, (ii) investigate the collaboration practices that these companies use to coordinate internally between operations and product development departments and externally with supply chain partners, and (iii) gain a deeper understanding of the factors affecting the adoption of the different configurations and collaboration practices.

Companies need resources and competencies to manage a process of internationalization. Therefore, SMEs might need to find specific ways to successfully overcome the hurdles to foreign development, thus making different choices in terms of both supply chain and product development management. In order to investigate the difference in the approach to internationalization, large companies will be included in the analysed sample and considered in the analysis as benchmark for the SMEs.

The paper is organised as follows. Section 2 provides a review of the main scientific contributions in the field, and section 3 outlines the theoretical framework and the research objectives of this study. Section 4 describes the methodology, and section 5 presents the findings of the research. Finally, section 6 offers the discussion and section 7 presents the concluding remarks and discusses limitations and future research directions.

2. Literature review

2.1 The fashion industry

Fashion supply chains are described by: first, identifying the main actors; and second, identifying which activities those actors perform (Abecassis-Moedas, 2006). Birtwistle et al. (2003) identify seven different types of actors within the supply chain: raw materials manufacturers, yarn manufacturers, fabric manufacturers, garment manufacturers, distributors, retailers and final customers. The main activities performed are purchasing, production, distribution and retailing, and product design (Graafland et al., 2002).

As far as the product development process is concerned, Kincade et al. (2007) identify four main phases of the development process in the apparel industry: i) ideas and research, ii) line conceptualisation, iii) preparation for production, and iv) market preparation. Tyler et al. (2006) analyse the product development process using a supply chain perspective, identifying different development activities at different stages in the supply chain.

The fashion industry can be variously segmented. According to the most well-known segmentation scheme, i.e., the one based on product positioning, companies can be classified into three segments ranging from: (i) haute couture, to (ii) *prêt-à-porter* to (iii) mass market (Waddel, 2006). In the first segment, there are companies that sell products in small quantities at a high price to high-end customers, whereas in the third segment, i.e., mass market, there are companies that sell products in large quantities at a low price to the mass market. The second segment has intermediate characteristics between the two extremes. Fashion companies also can be classified according to the amount and nature of activities that they carry on internally, ranging from those who are strongly vertically integrated to those that outsource almost all their activities (Abecassis-Moedas 2006).

The literature on SCM in the fashion industry focuses on the mass-market segment, i.e., low-end, high-volume products (e.g., Waddel, 2006, Simatupang et al., 2004; Camuffo et al., 2001). In this segment, there are usually two main types of players: a focal company that directly controls product development, distribution and retail activities while relying on external manufacturers – often located off-shore in low-cost countries – for production. Therefore, when applicable, collaboration among supply chain partners aims at smoothing the production and logistics processes to increase supply chain responsiveness and timeliness (Pero et al., 2010), and there is no need to interact during the product development process.

To our knowledge, little is known about the other segments, i.e., haute couture and *prêt-à-porter*. The few studies already performed suggest that these segments differ from the mass-market segment both in their supply chain and product development choices. For instance, Brun et al. (2008) outline that in the high-end segment of the fashion industry, to maintain control over both the supply and the distribution sides of the chain, brand owners either are integrating or increasing their control over the supply chain. Moreover, although innovation in fashion is in most cases linked to appearance and aesthetics, i.e., innovations are aimed at introducing more fashionable products and not always more functional ones (Pesendorfer, 1995), Donà and Garzoni (2003) have found evidence that some companies in the haute couture segment give a growing importance to the technical features of the products compared with the predominance of aesthetic innovation in mass markets. This new emphasis on technical features results in a need to involve external players, who own the technical knowledge, into the innovation processes. Due to these differences, the managerial models developed and tested for the mass market might not be applicable to the other segments.

Therefore, we believe there is a need to research how firms in the different segments of fashion industry, e.g. high end or luxury, manage their supply chains and product development processes. It should be noted that luxury companies are often small or medium. From our perspective this is interesting, since, as Yu and Lindsay (2011) note, despite the fact that small- and medium-sized enterprises (SMEs) are actively engaged in international outsourcing, they are often overlooked in the literature because researchers are usually attracted by large multinational corporations (Di Gregorio et al., 2009).

2.2 Internationalization of operations

The internationalization of operations is a phenomenon that has affected many industries. In the apparel and clothing industry, the increased competition among clothing retailers has raised a high concern on low cost strategy, thus pushing companies to move suppliers from high wages countries to low wages countries (Graafland, 2002). Scholars typically view offshore outsourcing as a means of reducing the cost of manufacturing activities for large corporations, yet offshore outsourcing may include activities outsourced by SMEs (Di Gregorio et al., 2009; Tan et al., 2006). Moreover, other reasons than costs can push companies to source foreign manufactured products, i.e. quality and availability (Cho and Kang, 2001), or to enter into foreign overseas markets (Etgar and Rachman-Moore, 2008)

Different strategies for internationalization have been observed, e.g. in the Italian footwear districts (Amighini et al., 2006). Companies can look for suppliers in foreign countries (Trent and Monczka, 2003), or locate their own production facilities offshore (MacCarthy and Jayarathne, 2009), or enlarge their selling market to include emerging countries (Abecassis-Moedas, 2006; Doherty and Alexander, 2006). In the choice of the strategy to pursue, both selling and sourcing markets should be considered

(Swoboda et al., 2009). As for manufacturing, the new paradigm of global manufacturing virtual networks is emerging and it has been observed in several industry sectors such as electronics, automotive, and even aerospace (Shi and Gregory, 2005). As for distribution, fashion companies have become more and more international (Courault 2005), making research about internationalization an emerging discipline.

Internationalization of production activities however creates new problems to companies, e.g. more complex planning due to longer and more uncertain lead times and lower reliability. For example, Wu (2011) proposes a linear programming model to plan production loading problems with uncertainties of demand and import quotas faced by a global apparel manufacturing company

2.3 Internationalization of product development

In the context of product development, since the last decades, organizations have begun to disseminate product development effort globally, by leveraging company and third party resources, assets and capabilities at a global level in order to exploit internationally dispersed capabilities and to maximise the returns on commercialising innovations on an international scale (Eppinger and Chitkara, 2006; Perks and Wong, 2003). As for operations, product development activities can be outsourced or relocated from the home nation to a foreign location (Contractor et al., 2010).

These emerging practices in product development exploit highly distributed, networked development process, in which centralized functions are combined with resources located in other sites or regions of the world (Eppinger and Chitkara, 2006; Gomes and Joglekar, 2008; Anderson et al., 2008). Since global product development practices involve multiple organizations in different countries, several models are emerging. Barzack and McDonough (2003) find two competing needs that induce companies to adopt different approaches. On the one hand the need to develop a global product that addresses multinational customers by a common product platform. On the other hand the need to develop a tailored product that incorporates unique needs and requirements of a local market. Eppinger and Chitkara (2009) and Tripathy and Eppinger (2007) confirm and build on the previous studies. They argue that companies build global product development capabilities for any of the following four reasons: lower cost, improved process, global growth, and technology access.

In the fashion industry, internationalization requires new forms of operations-product development alignment. Fashion companies that internationalize their supply chain, to remain competitive in the international arena, revise their product development process to incorporate local styles, making this process particularly challenging (Ganesan et al., 2009). Caniato et al. (2013) noted that, to meet the requirements of international markets, different approaches to the integration of Product Development and international retail are needed, depending on some contingency variables, including company size

2.4 Collaboration

Collaboration on operational processes is a popular topic in the SCM literature (Cagliano et al., 2003) and, even though different authors use different names – i.e., integration, coordination, or collaboration (Simatupang and Sridharan, 2005) – as synonymous or as having little difference among them, information sharing and joint decision making on logistics and operations processes are the two main elements. Empirical works have verified the benefits in terms of performance improvement of the collaborative arrangements (Singh and Power, 2009). Models and tools have been proposed for

improving information sharing (Byrne and Heavey, 2006) and building strategic partnerships and trust (Brun and Pero, 2011) among the logistic network partners.

Researchers in both the realms of SCM and innovation management have devoted great attention to collaboration on product development (Cagliano et al., 2000). Various aspects of the issue have been investigated, such as supplier selection (Petersen et al., 2003), the supplier's level of responsibility within the process (Spina et al., 2002; Roy et al., 2004) and the impact of suppliers' involvement in firm's performance (Johnsen et al., 2009). Finally, other contributions stress the importance of coordinating and integrating operations and the product development process (Pero et al., 2010; Christopher et al., 2004).

In the fashion industry, the majority of the contributions to supply chain collaboration focuses on information sharing and collaboration on operational processes between retailers and manufacturers during the selling season, i.e., when the product development process has been completed (Christopher and Peck, 2004; Jacobs, 2006), or during early sales to show the possible benefits achievable through the higher visibility of sales data during product design (Tyler et al., 2006).

3. Research framework

In this section, we present the research framework built to investigate the different choices in terms of operations, product development and collaboration practices of firms belonging to different segments of the fashion industry, as well as the contingent variables affecting these choices. In particular, as far as operations and product development are concerned, we consider both internationalization and outsourcing decisions.

3.1 Operations

Companies make different choices about the outsourcing of operational activities and the complexity of their supply networks (Caridi et al., 2010; Pero et al., 2010). We refer to the outsourcing choices made by a brand-owning company with respect to purchasing and production and the complexity of the associated supply network.

We focus on two main operational activities: purchasing and production. Purchasing encompasses all the activities related to selection of raw material suppliers, negotiation, order emission and inbound logistics (Dobler and Burt, 2006). Production refers to all of the activities connected to finished product manufacturing. Figure 1 presents the available alternative for operations.

<Insert Figure 1 approx. here>

Supply chain complexity depends on the number of suppliers and their geographical locations (Caridi et al., 2010, Pero et al., 2010). We focus on both dimensions independently. Suppliers can be located near the company, i.e., Local, or in the countries around the home country of the company, i.e. Regional, or far away from the company, i.e. Global (e.g., if the company is European, global suppliers can be in located in the Far East). Moreover, simple networks are made up of a few large suppliers (that may act as hubs to manage more complex networks of second-tier suppliers), whereas more complex networks are made up of many small first-tier suppliers.

3.2 Product development

Symmetrically, product development decisions relate to the phases of the product development process outsourced to external partners. The product development process of a fashion company has been divided, in line with Kincade et al. (2007), into: i) concept design and line conceptualisation, ii) product design, and iii) industrialisation. The first phase encompasses the definition of the concept and the structure of the new collection; the second phase involves the detailed design and the definition of the product specifications of the single items in the collection; and the third phase defines the manufacturing and assembly processes. Prototyping activities are included in the last phase.

It should be noted that when a product development phase is carried on “inside” the brand-owning company, collaboration with external suppliers can take place, and the opposite is also true: when a product development phase is managed by suppliers, collaboration with the brand-owning company can take place. Figure 2 depicts the available alternatives for the product development process.

<Insert Figure 2 approx. here>

3.3 Collaboration level

Barratt (2004) distinguishes between internal and external collaboration: the first refers to the collaboration across functions within the same company, whereas the second encompasses collaborative relations with external organisations. With respect to the external collaborations, Barratt distinguishes between vertical collaboration (i.e., with suppliers and customers) and horizontal collaboration (i.e., with competitors and external organisations). In this paper, we investigate both internal and external-vertical collaboration. Collaborative relationships can also be classified according to the content of the information shared and the main decisions that are jointly made by the parties: collaboration on operational processes and collaboration on product design (Brun and Pero, 2010). In this work we focus on collaboration on both operational activities and the product development process.

Hereafter, the term ‘collaboration level’ is used to indicate how intensively firms or business units collaborate. Collaboration intensity among supply chain partners varies depending on the level of the supplier’s involvement in the process (Spina et al., 2002; Roy et al., 2004), i.e., the phase of the process in which the partner is involved and the content and amount of the information exchanged. The same applies to internal collaboration.

There is a link between the practices adopted between organisational units and the collaboration level, for instance, practices and tools such as Vendor Managed Inventory or joint decision making are associated with a higher level of collaboration and integration between the client and suppliers compared to simple, mono-directional information sharing (Hill and Scudder, 2002).

In line with Van Echtelt et al. (2008), to overcome the traditional limitation of existing research, we consider the internal structure of each supply chain partner to discover who, i.e. which department, is actually involved in the collaborative relation. Given the focus of the present work, we focus on two departments, i.e. Product Development and Operations, which are respectively responsible for designing and developing the new products, and managing operations, i.e. sourcing, manufacturing and distribution. The two departments might have strong collaboration level, e.g. high information shared between the departments, or low collaboration level, e.g. the Operations department of the supplier is involved only in the last phase of the product development process performed at the clients’. Figure 3 shows an example of the studied relations among different departments belonging to two different companies, i.e. a supplier and the client of a supply chain. An arrow indicates that the two departments

interact. A solid line means that the collaboration level between the two departments is high, and a dashed line means that the collaboration level between the departments is low.

<Insert figure 3 approx. here>

3.4 Theoretical framework and Research Questions

Figure 4 presents the theoretical framework.

<Insert figure 4 approx. here>

The decisions regarding internationalization and outsourcing of both operations and product development are expected to be relevant in determining the collaboration level between departments within and across companies. For instance, we expect that the choice to outsource production activities, while keeping control of the sourcing of raw material inside the firm's boundaries, results in the need for high information exchange between the brand-owning company and the subcontractor. Moreover, we expect that outsourcing some phases of the product development process to suppliers requires high information exchange and therefore collaboration; and that having a frequent interaction with suppliers located overseas is complex.

A set of preliminary drivers have been hypothesised. This set is to be enriched by means of the empirical research. In particular, the choices regarding operations and product development, as well as of the level of collaboration, are expected to depend on the features of the products and of the company. These features are: product positioning and relevance within the collection, and size and positioning of the brand-owning company, as well as size and competence of suppliers.

Outsourcing decisions and the collaboration level between companies are affected by the strategic importance of the purchase (Olsen and Ellram, 1997). In the fashion industry, the strategic importance of a product line can be measured against its positioning in the market, whereas for a subset of products in a product line, strategic importance can also be measured against its relevance within the new collection, for instance in terms of brand awareness creation.

Firm positioning ranges from High-end/luxury to Medium-end to Low-end (Caniato et al., 2009), according to the price positioning of the finished products. Although we recognise that more specific variables can be used to define firm positioning (e.g., Waddel, 2006), it is not the aim of this work to enter into the details of such classifications. It should be noted that high product positioning can be associated with high product quality.

Based on the developed theoretical framework, the following research questions have been defined:

RQ1: What are the internationalization and outsourcing choices for operations (RQ1a) and product development (RQ1b) adopted in fashion supply chains? How are they related (RQ1c)?

The answer to these questions provides a taxonomy of the decisions regarding internationalization and outsourcing of operations and product development of fashion firms.

RQ2: What drivers influence companies' decisions in terms of internationalization and outsourcing of operations (RQ2a) and product development (RQ2b)?

Companies' decisions are expected to be influenced by some drivers, e.g. company size and positioning. Some already have been hypothesised, others are yet to be identified.

RQ3: How do the decisions regarding internationalization and outsourcing of operations and product development affect the level of collaboration among companies in the fashion supply chain?

The aim of this question is to investigate how the combination of operations and product development decisions, identified with the previous research questions, influences the level of collaboration within and across companies in the fashion supply chain.

4. Research Methodology

Exploratory case study methodology was used to investigate how companies configure and manage their supply chains. In fact, case studies are normally used to gain a more in-depth understanding of the research, often in an effort to answer “how” and “why” questions (Eisenhardt, 1989; Yin, 1984).

Multiple-case sampling was used to increase confidence in the findings (Miles and Huberman, 1984) and support their external validity. In fact, multiple retrospective case studies have been performed in six **differently sized** brand-owning companies operating in different segments within the fashion industry, i.e. with different firm positioning and selling different types of products (see table 1). **Large companies have been included in the sample too, in order to be able to investigate the specificities of SMEs in managing internationalization and outsourcing.** The choice of a heterogeneous sample follows a theoretical replication approach (Yin, 2004), and it aims at exploring different practices in terms of supply chain management and product development. This number of cases is generally considered acceptable to gather a good understanding of the phenomena under investigation, with a theory building purpose (Eisenhardt et al., 1989; Voss et al., 2002).

<Insert table 1 approx. here>

A well-defined study protocol, which describes all the steps that have to be followed to conduct the research, has been defined and shared by all of the research participants, and a case study database to store notes and other documentation and information has been developed. Information has been collected by means of semi-structured interviews and documentary analysis. All of the interviews were tape-recorded and transcribed; generally, a telephone follow-up with the respondents was conducted to assess the outcomes and to gather missing data.

In each company, interviewees were operations and supply chain managers. In each company, interviewees were asked to describe whether there are sets of products that they manage differently in terms of operations and product development. For instance, they were asked whether there are products that they neither manufacture nor develop, but instead buy from external suppliers.

In this study, each set of products that is managed differently from the others in the same company, i.e. each set of products for which different choices of internationalization and outsourcing of operations and product development were made, is a unit of analysis. Therefore, as shown in table 2, in four companies, multiple units of analysis were identified, thus ten units of analysis in total have been analysed. It can be noted that each set of products has a different positioning.

For each unit of analysis, the distinguishing features of the set of products and the manner in which operations and product development are managed were investigated. Special attention was paid to the specific departments involved in internal or external collaboration and to the practices used to support collaboration.

<Insert table 2 approx. here>

5. Results

5.1 Internationalization and outsourcing of operations and related drivers

In order to answer RQ1a and RQ2a, i.e. how companies configure their operations in terms of internationalization and outsourcing, as well as the reasons for such a decision, we have classified our units of analysis in three groups, according to the location of their operations: Local, Regional, and Global, as shown in Figure 5.

<Insert figure 5 approx. here>

The Local choice is adopted by firms that subcontract (OP2) production to networks of many small suppliers located in a small area (region or country) next to the brand-owning company, while keeping inside the purchasing of raw materials. These companies are mainly focused on high-end and luxury products (i.e. F and E-High end). Indeed E-High end and F delegate production activities to a complex network of micro-companies, artisans and family businesses. The drivers for this choice are: i) the need to keep a strong control on quality, ii) the relevance of the label “made in Italy” for market success, and iii) the need for reactivity to changes in market demand, which would not be achievable with suppliers located overseas.

The Regional choice is adopted by firms with different levels of outsourcing of operations, but all located in Europe or in nearby countries (e.g. North Africa, Turkey). Company A-High end is the only company that performs a relevant percentage of the production of several different products in directly controlled facilities, i.e., that chooses a hybrid configuration OP1/OP2. Two reasons lay behind this choice: (i) the need for high product quality, which requires company A to control manufacturing activities directly, and (ii) the need for a reactive production system to face rapid, unexpected changes in demand. Indeed both own facilities and subcontractors are located in Europe or in surrounding areas, to allow both control and speed of delivery. In fact, when quality is not an issue, Company A satisfies the expected demand of High-end products by buying finished products from manufacturers located in nearby lower-cost countries, while it exploits the high reactivity of internal production to satisfy (unexpected) demand peaks.

Similarly, B-core and E-Medium end outsource their operations (mostly full outsourcing) to nearby countries, to balance the need for control and speed with the flexibility of outsourcing and the lower cost compared to the home country. The main difference compared to A-High end is the size of the company, which does not allow to invest in directly owned facilities.

Finally, the Global choice is generally characterized by full outsourcing (A-Low end, B-Non core, C, E-Low end), since there is no particular need for tight control. In a few cases (D and partly A-Low end) subcontracting is adopted, to allow consolidating purchasing volumes to achieve significant savings. In fact, Company D directly manages the purchasing of leather at global scale to exploit the higher bargaining power with raw materials suppliers that the company can have with respect to its subcontractors. Clearly the lower positioning of the product is the key driver that pushes company to exploit all the benefits of low-cost countries.

These results show that SMEs that adopt a global scale (B-Low end, C, E-Low end), choose the full outsourcing model. Clearly this is a more accessible way to go global compared to vertical integration.

However in our sample no company goes global with a vertically integrated model, no matter the size, therefore company size does not appear as the main driver for this choice.

5.2 Internationalization and outsourcing of product development and related drivers

Moving now to the decisions about product development (RQ1b) and the related drivers (RQ2b), case studies confirm the expected design-centric nature of these companies: all the companies perform at least the first phase of the product development process internally, i.e., concept design and line conceptualisation. Therefore, the complete outsourcing of product development (PD4) is not found in any company of the sample.

The choice to outsource development activities is affected by the positioning and relevance of the product line, as well as by firm positioning and the complexity of company's product portfolio. In particular, in high-end fashion companies such as Company F, products are generally fully developed internally (PD1). However, in companies that manage a complex product portfolio, only the product lines with a higher positioning are usually developed in house (PD1 - A-High end and E-High end). Indeed, these same companies allow first-tier suppliers to develop products with a lower positioning, either outsourcing only industrialization and prototyping (PD2 – A-Low end and E-Medium end) or also product design itself (PD3 – E-Low end).

In companies operating in lower market segments with more technical products and with no brand portfolio to be managed, product design is usually managed directly by the brand-owning company, outsourcing only industrialization and sampling (PD2), as in Company C. Companies indeed tend to delegate the industrialisation phase (in particular prototyping and sampling) to the same suppliers that will subsequently manufacture the products, so to reduce reworks and problems that may occur during series production. This is also the case of Company B-Core, while for B-Non core, i.e. items that do not have a central role within the product range, also product development is outsourced (PD3). This is the case for example of beach slippers, since core products are swimsuits. Finally, also suppliers' capabilities play a mitigating role. In fact, Company D manages its supplier network differently depending on their development capabilities: highly skilled suppliers are in charge of the industrialisation of key products (PD2), whereas Company D carries out internally (PD1) the industrialisation of lower-end products, which are then produced by less skilled, low cost suppliers.

Company size does not seem to play a major role in respect to new product development outsourcing, since we find both SMEs and large firms adopting both PD1 and PD2 choices. However, we find only smaller firms (B-Non core and E-Low end) the PD3 choice, i.e. the highest level of outsourcing in the sample. Although this is mainly explained by the product role as discussed above, also the need to focus the limited resources available on core activities clearly plays a role.

5.3 Taxonomy of internationalization and outsourcing of operations and product development

By mapping the identified units of analysis in a two-axis matrix (see figure 6), a taxonomy of the different choices of internationalization and product development of operations and product development process has been developed, thus allowing to answer RQ1c.

<Insert figure 6 approx. here>

Figure 6 shows that the decisions about operations and product development are related; in fact, most units of analysis are on the diagonal of the matrix. Indeed, product development is performed internally (PD1) when operations are local (F and E-High end) or regional but directly owned (A-High end). Regional outsourced operations are characterized by the outsourcing of industrialization only (PD2 – B-Core and E-Medium end). Global operations finally are characterized by either outsourcing of industrialization only (PD2 – A-Low end, C and D) or also product development (PD3 – B-Non core and E-Low end). The only partial exception is Company D for some low end products, whose suppliers are not capable of product development and therefore it is performed internally.

It should be remarked that suppliers that contribute to product innovation are generally the ones that will manufacture the finished product. The industrialisation phase is carried out internally only when the production is internal (A-High end) or when it has been outsourced to subcontractors but the company wants to control them completely (E-High end, F and partially D).

In general, a higher positioning in the market and/or products with higher relevance within the firm collection call for higher integration along both directions, i.e., operations and product development.

Figure 6 shows that three main configurations, i.e. three main sets of concurrent and coherent decisions about internationalization and outsourcing of operations and product development, can be observed:

- i. The “**integrated**” configuration: this configuration is characterised by an internal product development process and by a subcontracting model for the operations, which is usually characterised by a local network of suppliers (or regional but directly owned);
- ii. The “**collaborative**” configuration: this configuration is characterised by outsourcing the last phase of product development process and by a high level of outsourcing of operations as well. Larger suppliers are involved and operations are either regional or global;
- iii. The “**virtual**” configuration: full outsourcing is the dominant operational model at global scale. Both product design and industrialisation are outsourced to external suppliers.

As far as company size is concerned, we find both SMEs and large firms in the “integrated” and “collaborative” configurations, thus suggesting that size does not play a major role in this respect. However, in our sample only SMEs adopt the “virtual” configuration to manage non-core products. Therefore we can conclude that not only SMEs can choose among all the possible configurations, but also that the “virtual” configuration can be adopted selectively by SMEs to manage with a lower effort non-core products, while focusing their resources on the core ones.

5.4 Collaboration practices

Figure 7 presents the internal and external collaboration level in the different units of analysis, thus allowing to answer RQ3.

“Integrated” companies, i.e., companies outsourcing some manufacturing activities while maintaining control over the product development process, guarantee alignment between product development and operations by leveraging the combination between i) internal integration of the product development and operations departments, and ii) collaboration between the two operations departments (see A-High end, E-High end and F). The Operations and Procurement Director of Company A stated: “*Internal integration is a strategic lever to ensure product development process efficiency*”. Indeed, Company A has put in place effective practices in terms of cross-functional coordination between operations and product

development using both technological and organisational tools: software for rapid prototyping and a specific organisational role that enables internal integration by supporting information exchange and integration of activities between the creative product development team, the technical development unit and operations. The person in charge of this integration is formally in the operations business unit, but she/he participates in the product development process from the very beginning with the aim of communicating to designers the constraints and opportunities of both internal and external factories.

For “collaborative” companies, there is no evident pattern of behaviour concerning internal and external collaboration practices. However, it might be observed that the collaboration level with external partners increases when technically and technologically complex products are developed. For instance, Company B, for B-Core products, also collaborates in the early phases of product development, especially when technically complex products are at stake and the technical capabilities of the suppliers must be combined with the design skills of the internal product development unit.

Moreover, in Company C, a trading company mediates the relationship between the client and the supplier. Company C owns the trading company, and the trading company is linked with company C by means of an integrated IT systems. As far as operational processes are concerned, the Far East manufacturer and Company C exchange information about demand, capacity, and production plans through the trading company. In contrast, during the product development process, Far East manufacturers are involved in preparing prototypes. Indeed, the mould for the production of soles is directly manufactured by the Far East supplier, which often proposes changes in product design to enhance its operational performance.

In “virtual” companies (e.g., B-Non core and E-Low end), i.e. those companies in which the full outsourcing model takes place, internal integration between product development and purchasing and supply chain units is generally lower than in “integrated” companies. Indeed, in Company E-Low end, the purchasing department is usually involved at the end of the development process to identify proper external manufacturers. In Company B, for Non-core products, the product development unit directly selects the suppliers, and the purchasing unit is involved only to manage production and distribution. Also external collaboration is limited, compared to “collaborative” companies, since suppliers are given great autonomy.

The features of the supply network along with the positioning of the product have an important impact on the level of collaboration. The suppliers’ geographical location is very important: cultural and geographical proximity is crucial for fruitful collaboration on product design. Indeed, Company E has developed strong integration practice for High and Medium-end products, which are supplied locally or regionally, whereas collaboration is low in the case of Low-end products whose suppliers are located in the Far East.

Finally, it is worth mentioning that the capability of the brand-owning company to set up effective internal and/or external collaboration practices can have an impact on the choices of internationalization and outsourcing of operations and product development, thus changing the direction of the relation outlined in the framework (see figure 4). A very clear example is Company A, which is so good at internally coordinating product development and operations that it has integrated the design of some raw materials to leverage on this capability and improve the performance of the product development process. In the opposite situation, i.e., when internal integration is a weak point, companies do not have any advantage in terms of process efficiency in carrying out product

development and production processes inside the company, and outsourcing is more likely to take place.

Also in this case, we can observe that company size does not play a major role in determining the collaboration practices adopted, since we find both SMEs and large firms adopting various kinds of practices, with no clear difference. The only exception, once again, are the two cases of “virtual” configurations, with very weak collaboration practices adopted. The combination of outsourcing, global scale and limited size of the company makes strong collaboration very difficult and probably less needed.

<Insert figure 7 approx. here>

6. Discussion

This paper draws up a taxonomy of configurations of internationalization and outsourcing of operations and product development of companies belonging to various segments of the fashion industry, along with the corresponding collaboration practices. Moreover, it sheds light on the contingent drivers affecting the abovementioned decisions, including product positioning and company size.

This work shows that firms can make, even within the same company, completely different choices when addressing make-or-buy and develop-or-buy decisions, i.e., the decision to outsource design activities, and different products and product lines can be managed in different ways. As a consequence, to evaluate the suitability of specific managerial approaches to the management of fashion supply chains, it is necessary to take these differences into account.

In particular, for highly positioned products, when companies outsource manufacturing activities they rely on local networks of small suppliers that usually do not carry on relevant design and product development activities. This is synthesized by the Integrated configuration, which is characterized by fully internal product development and subcontracting of manufacturing (but not of purchasing) to a network of local suppliers, sometimes with part of production performed in directly owned plants located regionally (for larger firms). This is the typical configuration adopted when the priority is to provide the highest quality and control on the whole process, allowing also a high speed and reactivity.

A second, very frequent configuration is the Collaborative one, characterized by collaborative product development (typically the suppliers take care of industrialization) and production outsourced either regionally or globally, typically leaving also raw materials purchasing to suppliers (except when purchasing volumes are in favour of the brand owner). This configuration allows a good compromise between quality and control on one side, and cost on the other.

Finally, in the Virtual configuration, full outsourcing of both product development and manufacturing takes place at global scale, typically for low-positioned products with a low relevance within the collection, by medium-large suppliers with strong technical or design experience. Often in this case the level of collaboration is low, with the brand owning firm providing just the initial concept and then checking for conformity. This configuration provides the lowest cost, with acceptable quality, although speed and reactivity are limited by distance.

Configuration and collaboration decisions are therefore affected by some contextual variables, i.e., positioning and relevance within the collection of finished products (including quality issues), company size, and the technical content of the product.

First, in our sample, the product development processes of highly positioned products are more likely to be carried on by the brand-owning company, which also controls purchasing activities. Moreover, high-end products are produced by a network of local suppliers, which is made up of small companies. Second, **although both SMEs and large firms adopt similar configurations as long as higher-end products are concerned, in case of non-core products SMEs tend to rely on a higher level of global outsourcing, often with suppliers who are larger than them, and therefore are very autonomous.** Third, higher volumes make scale economies more relevant, most of all with respect to purchasing, thus pushing companies towards direct control of these activities. Finally, products' or components' higher technical content and better design capabilities of the suppliers push companies towards a major involvement of suppliers in the product development processes. Indeed, brand-owning companies must rely on partners that can provide the knowledge and capability of designing and producing innovative materials and components.

Collaboration choices are also impacted directly by two variables, namely, purchasing volume and the technical content of the product. In fact, higher volumes increase the benefits of collaboration on operational processes; thus, for instance, the convenience of setting up integrated IT systems for sharing production data, while companies developing technical products need higher collaboration with suppliers during the product development process.

7. Conclusion

This paper provides useful insights to both researchers and practitioners. In fact, this paper contributes to fill several gaps in the academic literature. First, with respect to the body of literature about supply chain management in the fashion industry, this research provides a more complete picture of the industry, showing that different configurations of internationalization and outsourcing of operations and product development exist and that, in spite of the trend described in literature towards the outsourcing of upstream activities, i.e., manufacturing, to integrate downstream ones, i.e., distribution, different models can be adopted according to the context. Moreover, the present contribution is also important because it focuses on the inbound supply chain, which is frequently neglected by studies of the fashion industry, and connects operations with product development, differently from most papers. **Third, this paper investigates similarities and differences between SMEs and large firms, showing that not only both of them have various alternatives available, but in particular some configurations are adopted by companies of different size, while others are more specific. In particular, the same company can adopt different configurations for different product lines, thus balancing strengths and weaknesses and focusing its own resources.** Finally, the paper also shows how collaboration within and among firms varies according to the selected configuration. This is also a significant contribution to the literature, since often collaboration is seen as a “one best way”, to be adopted always, while our findings suggest that the need for collaboration is different according to the configuration adopted.

By identifying specific configurations within the fashion industry, this paper also provides managers with findings that can be related directly to the specific situations with which they must cope, instead of providing general solutions for the industry as a whole. In particular, our taxonomy is a synthetic and effective representation of the available alternatives that managers can adopt, taking inspiration from

leading firms. The drivers that we have identified can help them in selecting the most suitable ones according to their specific needs. Additionally, the configurations that have been observed are linked to practices and tools used by both operations and product development departments. This analysis contributes by going beyond the managerial approaches proposed for the fashion industry, which typically look only at supply chain management, by considering a broader set of activities, i.e., including product development. Therefore, our contribution potentially has a larger impact on business.

Besides, we have also shown that SMEs have a variety of options, which can allow them to compensate the smaller resources available compared to larger firms, while exploiting their flexibility. In particular, the adoption of the appropriate configuration for each product line, according to the specific characteristics, is a clear guideline for manager.

Moreover, the knowledge of how decisions of the brand-owning companies have an impact on collaboration within and outside firms' boundaries is particularly relevant in situations of turmoil, such as the one that the industry has been experiencing for the last few years. The temptation of reducing costs through a massive outsourcing of both operations and product development activities (Hon Kam, Chen and Wilding, 2011) can be dangerous if the way in which buyer-supplier relations are managed does not change accordingly. Practitioners cannot neglect these issues in making configuration decisions.

The main limitation of this paper is the size of the sample, however the variety of company characteristics in terms of size, products and positioning allows to have a significant picture of the industry. A future step of theory testing through large scale studies (e.g. survey) may be envisaged. Moreover, the topic is very broad, and the specific variables that are considered could be analysed with a much deeper level of detail: focused case studies aimed at analysing specific aspects of the model can be performed. However, since our goal was to provide an overview of the interrelationships among many variables, the level of detail is coherent with the purpose. Finally, the impact of the fit between configuration choices and internal and external collaboration practices on performance should be investigated to provide practitioners with a more normative study that could support them in decision making.

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Tables

Table 1: The analysed companies

Table 2: Units of analysis and main gathered data

Company	Turnover	Home country	Number of employees	Firm positioning	Main product
A	> 1.000 mln €	Germany	> 10.000	High/medium end	Shirts and formal clothing
B	25 – 50 mln €	Italy	50 – 250	Medium/low end	Beachwear and lingerie
C	250 – 500 mln €	Italy	50 – 250	Low end	Sport apparel and shoes
D	> 1.000 mln €	U.K.	> 10.000	Medium/low end	Shoes
E	50 – 250 mln €	Italy	50 – 250	High end/luxury	Beachwear and lingerie
F	> 1.000 mln €	Italy	2.500 – 5.000	High end/luxury	Leather goods

Table 1: The analysed companies




Com pany	Unit of analysis - ID	Product set features	Operations	Product development	Complexity of supply network	Geographical location of suppliers	External Collaboration	Internal Collaboration	Practices
A	A- High- end	High-end product lines	Hybrid: OP1 / OP2	PD1	Simple network: Medium-sized suppliers (where applicable)	Europe, the Middle East and Africa	Involvement of suppliers to monitor their technical capabilities Information sharing and collaborative planning at operational level	Strong internal integration	Ad-hoc organisational role to link operations (Company A's and suppliers') and product development Virtual prototyping software to rapidly communicate among functions
	A- Low- end	Low-end product lines	Hybrid: OP2 / OP3	PD2	Simple network: Large manufacturers	Far East	Collaboration with suppliers in the industrialisation phase Involvement of suppliers to monitor their technical capabilities Information sharing and collaborative planning at operational level	Good internal integration	Ad-hoc organisational role to link operations (Company A's and suppliers') and product development Virtual prototyping software to rapidly communicate among functions Direct support during the industrialisation phase
B	B- Core	Core products	Hybrid: OP2 / OP3	PD2	Simple network: Medium-sized suppliers	Europe, the Middle East and Africa	Collaboration on product design and industrialisation. Information sharing on order status	Low internal integration	Involvement of suppliers in the product design phase and direct support in the industrialisation phase Monitoring of the production of the first sample lot by the product development unit

Com pany	Unit of analysis - ID	Product set features	Operations	Product development	Complexity of supply network	Geographical location of suppliers	External Collaboration	Internal Collaboration	Practices
	B- Non core	Non-core products	OP3	PD3	Simple network: Large manufacturers	Far East	Collaboration on industrialisation Information sharing on order status	No internal integration	Distance support during the industrialisation phase
C	C	No distinction	OP3	PD2	Simple network: Large manufacturers	Far East	Low collaboration with Far East suppliers Verification of technical feasibility in the industrialisation phase Information sharing on order status	Low internal integration	Informal information exchange among functions Trading company manages the Asian supply network
D	D	No distinction	OP2	Hybrid: PD2 / PD1	Simple network: Large manufacturers (where applicable)	Far East	Support in the industrialisation phase to suppliers Information sharing on order status	Involvement of operations only at the end of the development process to select manufacturers	Operations controls the order status and check the quality of finished products Purchasing unit is involved earlier if special materials are required
E	E-High- end	High-end product lines	OP2	PD1	Complex network: High number of micro- companies	Local	Information sharing on order status	Low internal integration, only in the latest phases of product development	Informal communication among functions Direct control of local suppliers
	E-Medium- end	Medium- end	OP3	PD2	Simple network:	Europe, the Middle East	Collaboration with the supplier	Low internal integration	Informal communication among functions

Com pany	Unit of analysis - ID	Product set features	Operations	Product development	Complexity of supply network	Geographical location of suppliers	External Collaboration	Internal Collaboration	Practices
		product lines			Medium-sized suppliers	and Africa	from the product design phase Information sharing on order status		Direct support and collaboration during product development Suppliers' portal to exchange information with suppliers
	E-Low-end	Low-end product lines	OP3	PD3	Simple network: Large manufacturers	Far East	Low interaction with suppliers on product development and operational processes	Low internal integration	Informal communication among functions Suppliers are monitored through a Chinese subsidiary
F	F	No distinction	OP2	PD1	Complex network: High number of micro- companies	Local	Information sharing during production activities Operations monitor the technical capabilities of the suppliers	Good internal integration	Meetings, co-location and informal communication between functions Direct monitoring and control of the local supply network

Table 2: Units of analysis and main gathered data





Figures

ID	Operations		Description
OP1	Full insourcing		The sourcing of raw materials and production activities are managed by the brand-owning company.
OP2	Subcontracting		The brand-owning company carries out raw materials sourcing activities; the production process is outsourced to suppliers.
OP3	Full outsourcing		Both the sourcing of raw materials and production are carried out by suppliers.

Legenda: The first arrow represents purchasing, the second one manufacturing activities.

Black arrows = carried out by the brand-owning company; white arrows = carried out by suppliers.

Figure 1. Available alternatives for operations

ID	Product development	Description
PD1		The product development process is completely carried out by the brand-owning company, from concept design to industrialisation and prototyping.
PD2		The brand-owning company carries out the concept design and product design activities; suppliers carry out the industrialisation and prototyping activities.
PD3		The brand-owning company carries out only the concept development phase, relying on suppliers for product design and industrialisation.
PD4		The brand-owning company outsources all of the product development activities.

Legenda: The first arrow represents the concept design and line conceptualisation, the second arrow represents the product design, and the last arrow represents the industrialisation. Black arrows = carried out by the brand-owning company; white arrows = carried out by suppliers.

Figure 2. Available alternatives for product development

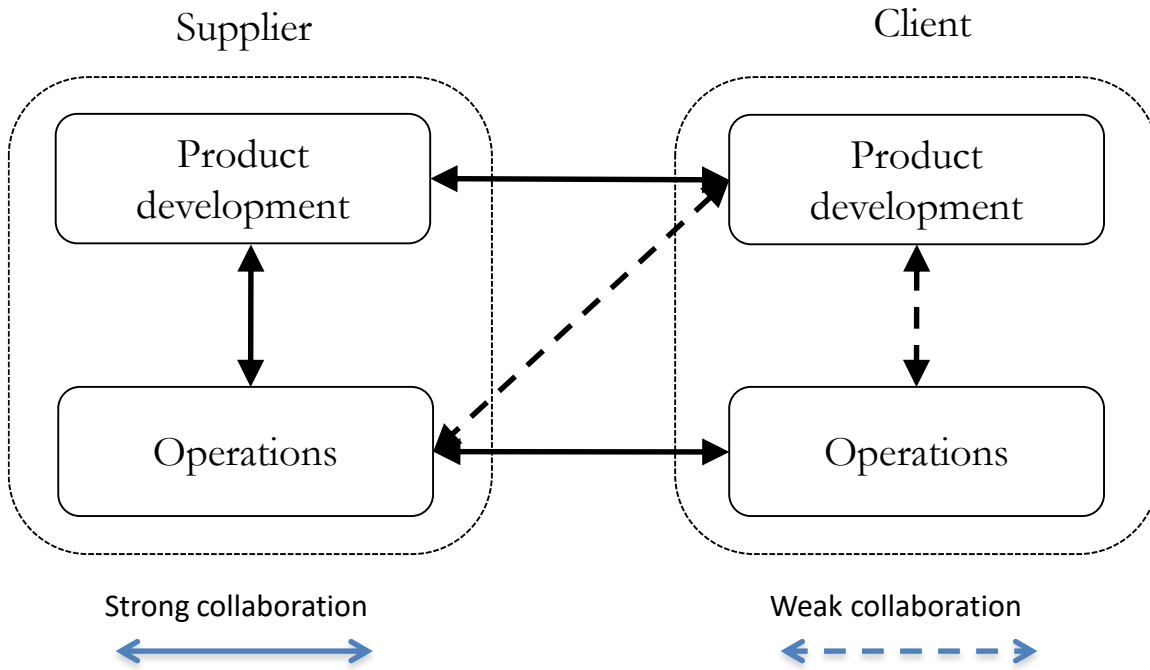


Figure 3: Collaboration level: framework of analysis

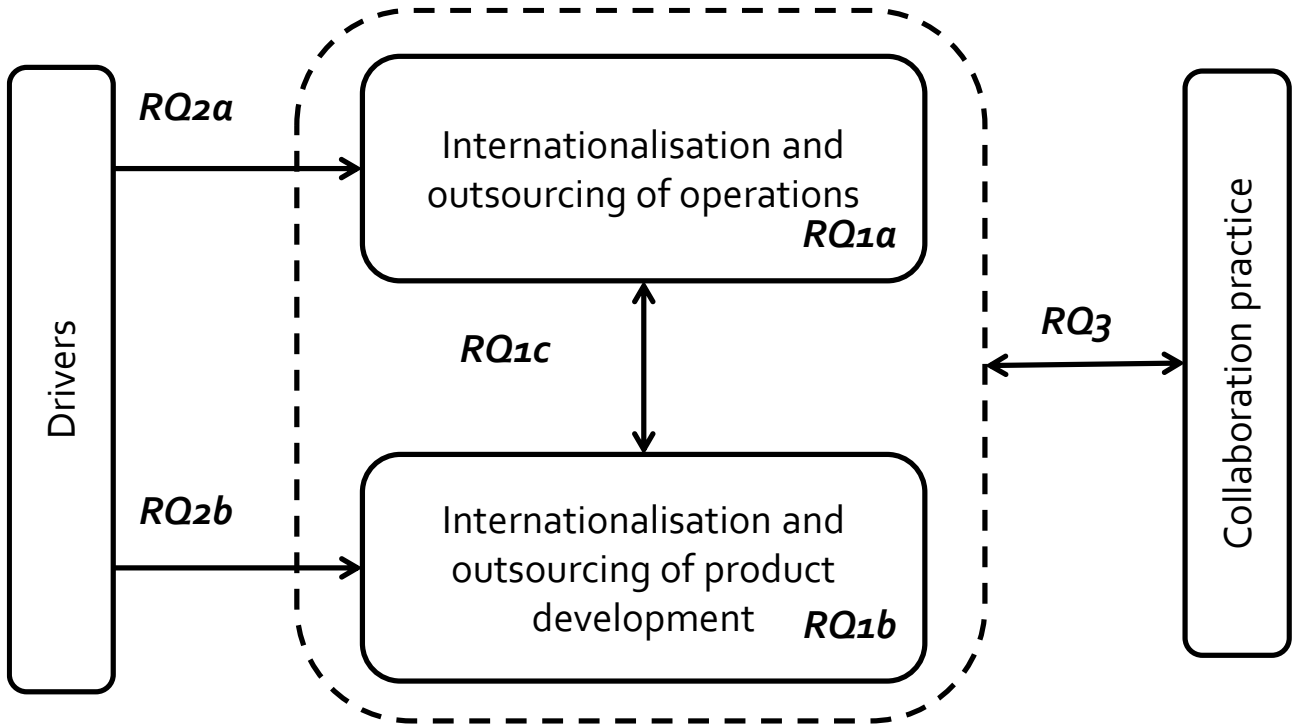


Figure 4: Theoretical framework

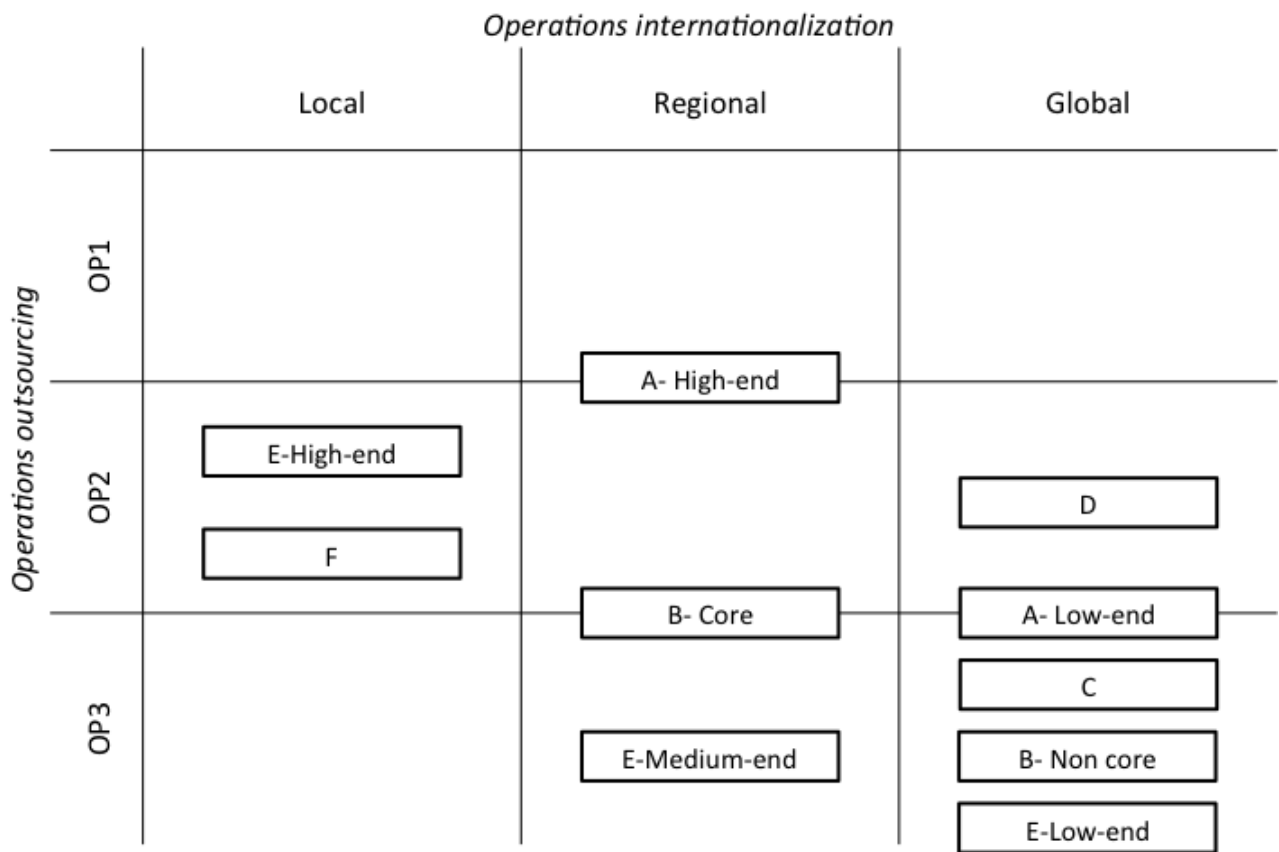


Figure 5. Internationalization and outsourcing of operations

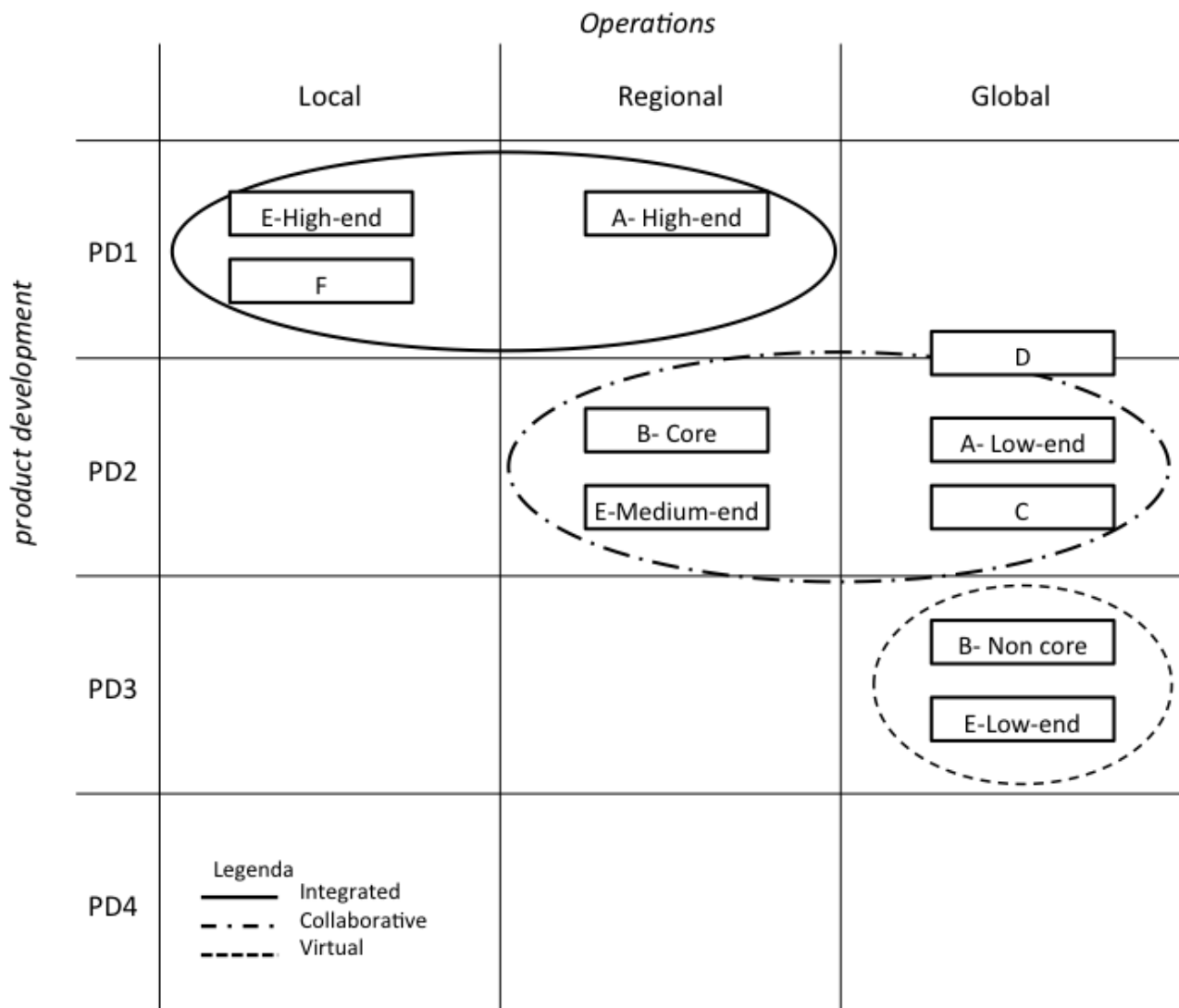


Figure 6. Taxonomy of internationalization and outsourcing of operations and product development

COLLABORATION PRACTICES

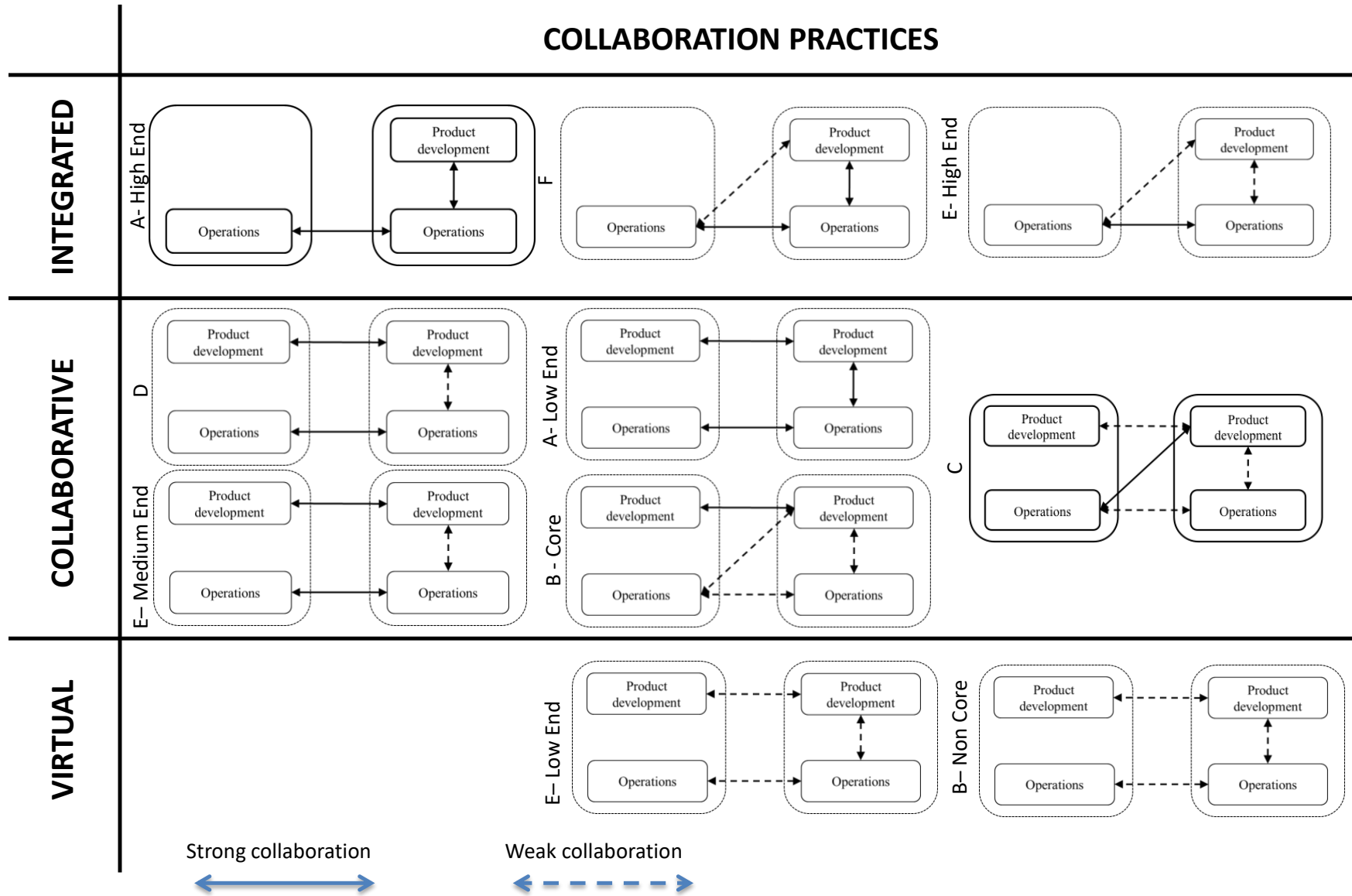


Figure 7. Collaboration practices

