RAPHAEL DOMÊNICO GARCIA ALEGRE

Supply Chain Integration: a survey in the Brazilian/Italian apparel industry

São Paulo

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To my Family and friends,

Who supported me
throughout my graduation.

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RESUMO

Esse projeto é dedicado ao estudo da integração da cadeia de suprimentos na indústria de confecção. A metodologia de pesquisa utilizada foi a realização de uma *survey* com empresas dessa indústria no Brasil e na Itália.

A partir de dois modelos de referência, “Supply Chain 4 C’s” e “SCOR Framework”, um questionário foi elaborado e enviado para as empresas com o intuito de medir o nível de integração das parcerias ítalo-brasileiras e identificar como esse fator influencia os indicadores de performance propostos pelo modelo SCOR.

Como resultados principais, foi possível comparar os respondentes brasileiros e italianos quanto à intensidade da integração e performance, assim como propor sugestões para melhoria da eficiência e eficácia da cadeia de suprimentos.

Além disso, coeficientes de correlação entre as dimensões dos dois modelos foram calculados para identificar as práticas mais benéficas para a gestão da cadeia de suprimentos nesse segmento da indústria.

Palavras-chave: Integração da Cadeia de Suprimentos. Supply Chain 4 C’s. SCOR Framework.

ABSTRACT

This project is dedicated to the study of Supply Chain Integration in the apparel industry. The research method used was a survey with companies from this industry in Brazil and Italy.

Having two theoretical models as reference, the Supply Chain 4 C's and the SCOR Framework, a questionnaire was designed and sent to the companies with the intent of measuring the Italian-Brazilian partnerships' integration level and identify how this factor influences the performance indicators proposed by the SCOR Framework.

As main results, it was possible to compare Brazilian and Italian respondents with regards to the integration depth and performance, as well as to propose suggestions for efficiency and effectiveness improvement.

In addition to that, correlation coefficients among the dimensions from both models were calculated in order to identify the most rewarding Supply Chain integration practices in this segment of the industry.

Keywords: Supply Chain Integration. Supply Chain 4 C's. SCOR Framework.

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LIST OF ABBREVIATIONS AND ACRONYMS

CPFR	Collaborative Planning, Forecasting and Replenishment
CRP	Continuous Replenishment Program
CSCF	Collaborative Supply Chain Framework
OBM	Original Brand-Name Manufacturer
OEM	Original Equipment Manufacturer
SC	Supply Chain
SCI	Supply Chain Integration
SCIM	Supply Chain Integration Management
SCM	Supply Chain Management
SCOR	Supply Chain Operation Model
VMI	Vendor-managed Inventory

SUMMARY

1 Introduction

This project intends to assess the partnership integration among companies inserted in the apparel industry. The focus of the analysis will be on Brazilian and Italian players and the main steps are as follows.

a) Understanding the current context regarding Supply Chain Management practices and their importance in companies' competitive advantage;
b) Study of the literature regarding Supply Chain integration and the variables that affect its implementation. Reference models such as the Supply Chain 4 C's, the SCOR framework and the CPFR model will be studied in the report as to obtain a solid background regarding what has already been studied about Supply Chain Integration. The basic research questions to be answered are:
   - How integrated are partnerships in the Brazilian/Italian apparel industry?
   - What are the main benefits and challenges of partnership integration?
c) Study of the apparel industry characteristics, main segments and the different Supply Chain strategies according to the market niche;
d) Definition of the main variables to focus on during the assessment of the partnership integration in Brazilian-Italian companies according to the reference models. Besides that, the main performance indicators are also taken into consideration so that it will be possible to understand how integration affects the company's performance;
e) Study of the "survey" methodology and design of a questionnaire to be sent to Brazilian and Italian apparel exporters. It will be based on the Supply Chain 4 C's model and on the SCOR framework;
f) Analysis of the responses and identification of relations among variables and the main bottlenecks. Propositions of roadmaps with improvement opportunities;
g) Identification of potential differences between Italian and Brazilian Supply chains and existent relations between these differences and the Supply chain integration dimensions.

The intention of this survey is not to prove a hypothesis, but rather be an exploratory study, which focuses on the understanding and mapping of the event in order to identify upon which variables it depends.

The final outcomes will be an analysis of Italian and Brazilian responses according to pre-defined dimensions and the basic relations integration has with the respondents' performance.

The importance of this survey is significant in a scenario where companies do not compete on an individual basis anymore, but on a Supply Chain basis. The final results for the customer are closely dependent upon partners' interfaces and communication inefficiencies. Therefore, the understanding of this event and the proposition of improvement initiatives are strategic activities both for companies inserted in cost-driven markets or service level-driven ones. This is especially true when it is verified, as it will be in this report, that Supply Chain integration affects a company's efficiency and effectiveness, depending on the practices put in place.

2 Literature Review

This section is dedicated to the study of the literature regarding Supply Chain Management and integration reference models and best practices.

2.1 Supply Chain Management

Companies in all industries, more and more, look forward to differentiating themselves among competitors either in terms of price or service level. These two types of competitive approaches depend on the value propositions of each brand and need to be clearly defined by the business unit's strategy and objectives in order for all the internal processes to be coordinated and performed coherently. The usage of consistent **information**, tracking of customer behavior, constant enhancement of internal processes and the **integration** of the company around its culture and objectives are key factors when it comes to its consistent performance and brand consolidation among the customer base.

However, the approach to **competitive advantage** in a specific niche varies according to the type of strategy being prioritized. If the idea is to be perceived as a differentiated brand in terms of value for the customer, the focus should be on possibilities of customization, constant improvement of the service level, decrease of end-to-end lead time and much attention to aspects related to customer experience and brand perception. On the other hand, if the source of competitive advantage is assumed to be on the products' pricing points, the main concerns of the management should be related to the company's cost structure, scale benefits, the possibility of outsourcing, increasing processes efficiency and employees' productivity and so on.

These considerations are much spread across the business body of knowledge and very widely taken into account by managers all over the world to enhance their brands' positioning and align their internal processes to the perception they want to have among customers. The main sources of **value creation** for a general company are described by Porter (1985), whose adapted model is displayed in Figure 1.

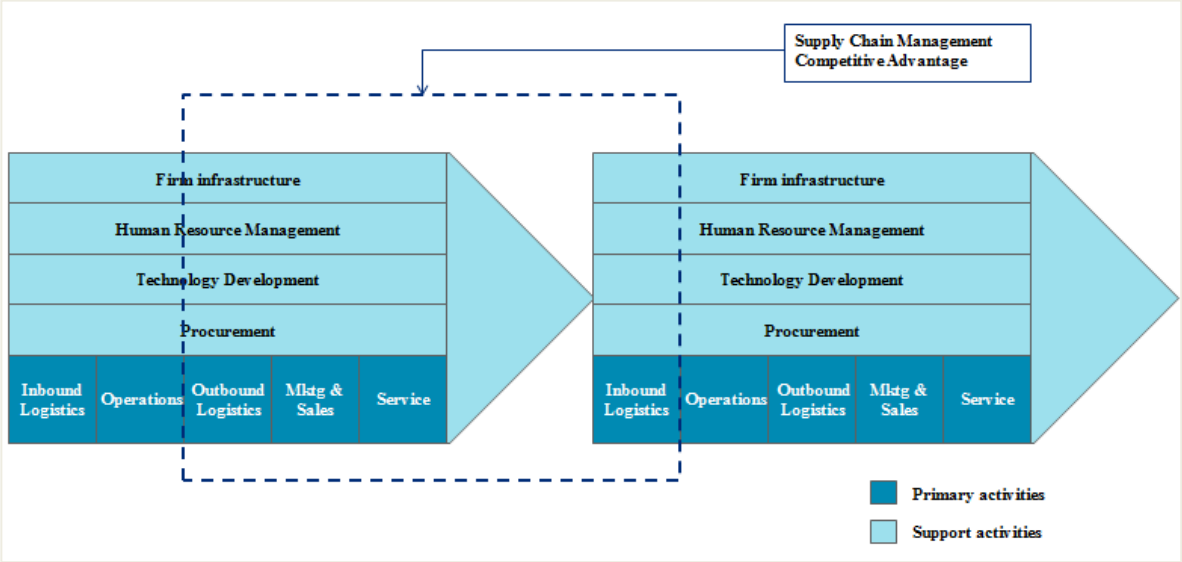

Figure 1- Porter's Value Chain Model for SCM. ***Source: elaborated by the author***

The diagram shows two basic types of activities performed in a given company: primary and support ones. The primaries are directly linked to the value creation in the corporate environment and, therefore, need to be extremely coherent to the company's branding strategy. It is not enough, however, to optimize internal processes and enhance primary activities' results without considering the external links that the company holds. It is in this context that Supply Chain Management has been taking an increasingly important role to enhance companies' profitability. The service offered to the final customers is not dependent only upon a company's internal processes, as can be seen in the diagram. By contrast, the perception consumers have regarding a product or a brand is the result of multiple interfaces that exist in a cross-enterprise scenario, i.e. in a Supply Chain (SC) scenario.

This increasing SC importance occurs due to the natural interactions that take place between internal and external processes in any industry's value chain. For instance, it is not logical to assume that a product will be perceived as a top product by its targeted customers if the distribution channels are not the ones where these customers are willing to shop, if the transportation of the lots is not conducted properly so that the product's features are preserved until its consumption by the consumer or, finally, if the raw materials acquired from the suppliers are not adequate in terms of quality standards and consistency for their intended usage in the production process.

Therefore, as can be seen in Figure 1, internal and external processes are interdependent and primary activities in a company X may be directly affected by other primary activities in a company Y. Supply Chain Management (SCM), in this context, appears as a potential source

of value differentiation and as a performance enhancer depending on how integration and information sharing among companies take place.

SCM, according to the Council of Supply Chain Management Professionals (2013), takes into consideration all of the logistics management activities, as well as manufacturing operations; besides that, it affects coordination of activities in the fields of marketing, sales, product design, finance and information technology in an inter-company level.

In Figure 2, it is possible to see a basic Supply Chain structure for a general industry, with the identification of its main entities.

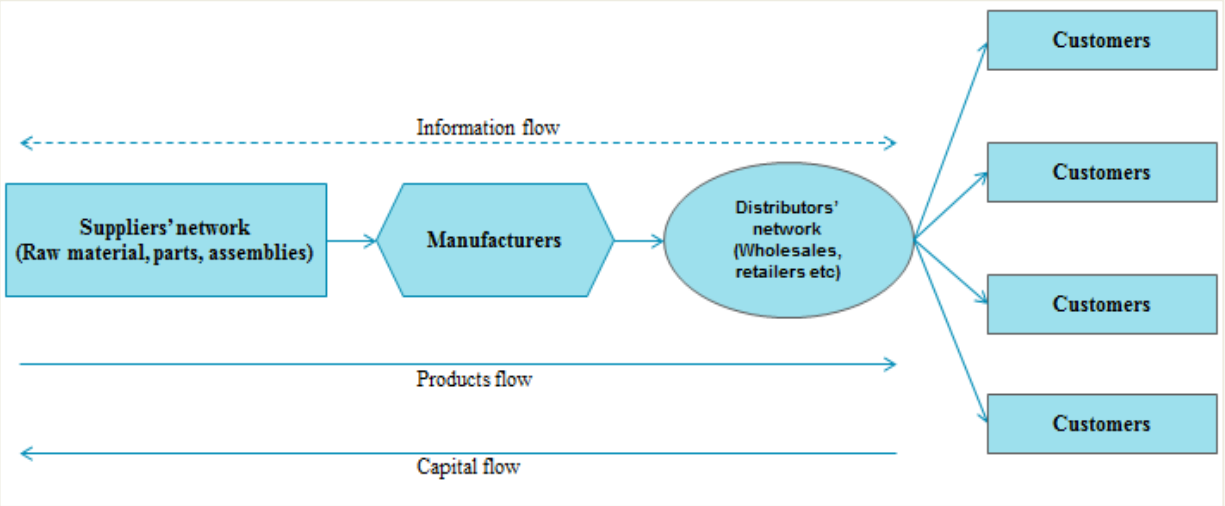

Figure 2- Supply Chain Model. ***Source: Lejeune (2005)***

Since the 1990's, competitive advantage has not been linked only to a company's internal activities anymore. In order for the adequate service level to be reached or the cost to be low enough so that the price still includes a reasonable margin for the company, it is primordial that an organization's external relationships be efficient and effective.

According to Li (2004), value creation has surpassed the enterprise limits, with competition no longer occurring among organizations, but among supply chains. Therefore, effective Supply Chain Management (SCM) is a powerful tool to secure competitive advantage and improve organizational performance.

There are several benefits of managing the Supply Chain structure efficiently and jointly with the other players involved. The removal of communication barriers and more **information sharing** are strategic methods of reducing uncertainty and partners' opportunistic behavior, with direct impacts on stock buffers, stock-out probabilities, flexibility of the network and service level for the final customer.

As can be seen in Figure 2, a Supply Chain consists of three flows happening across the enterprises that are related to each other. The first one is the product flow, which refers basically to the physical flow from one company to the next one (company X's output is company Y's input). The management of this flow involves many different and multidisciplinary variables, such as transportation practices, inventory holding, production process and inbound and outbound logistics procedures (picking, handling etc). The next one is the capital flow, which refers to the payment of the orders realized and delivered by the upstream segments of the Supply Chain and all the processes related to the invoice and financial management.

The last one is the information flow, which is a strategic asset of a Supply Chain structure and one of the main targets of current SCM practices, with increasing weight being given to the consistency of data and integration required. The next section, therefore, will be dedicated to explore this particular element in the SCM literature and to clarify the value that the right amount of trust and collaboration can bring to a company's performance both in terms of service level and profitability.

2.2 Supply Chain Integration

One of the main trends that have been constant in the business world in the last decades is the increasing internationalization of enterprise structures. According to Liu (2010), global SC's have several advantages, such as global resources allocation, integration and risk diversification, but also face fierce challenges related to the proper management that needs to be put in place to address these potential benefits.

The adequate adoption of SCM practices in management of global partnerships can lead to benefits such as decrease of trading costs, less inventory, shortening of capital turnover time, more income and profit and, finally, better customer loyalty and overall competitiveness.

As a result, entire SC's have to plan their processes in order to cope with additional difficulties arising, for example, from distance constraints between retailer and manufacturer, economic limitations such as tariffs and quotas and competition from low-cost countries, where the labor cost may be considerably lower, a very interesting factor for labor-intensive industries.

Therefore, the effects of globalization in SCM will be taken into consideration on this report.

The adoption of global SCM is more complex than that of domestic ones since there are additional difficulties related to cultural, geographic and time difference barriers. Below there

is a list of some of the problems that global SC's may face when foreign partners work together.

a) Length of the SC: global SC's tend to be longer than domestic ones. This element is directly dependent upon the maturity of the SC's integration capabilities, in terms of information systems and goodwill among the members.

b) Demand fluctuation: for global SC's, demand fluctuation is much more significant than for domestic SC's, once many more market scenarios are involved in the overall structure. Therefore, global SC's need to be flexible and prepared to cope with unexpected variations in demand and sales patterns. Global capacity strategies depend on the manufacturing strategies that SC participants have undertaken, such as make-to-stock, assemble-to-order, make-to-order or engineer-to-order.

c) Technology of integration: the adequate allocation of resources across the SC so that end customers are offered the required service level depends on each player's subsystems integration. As global SC's tend to be more complex and long than domestic ones, the performance of the whole chain is closely linked to the maturity of the integration systems that are put in place and, therefore, to the flexibility that the players have to redesign products, capital and information flows in a cross-enterprise scenario.

d) Information management: information is one of the most strategic assets that global SC's have and target. Without the adequate amount of information sharing, the whole SC planning becomes more uncertain and loses efficiency and effectiveness. Information also is related to external variables, such as Government policies, economic trends and other constraints that may be exogenous to the SC structure.

e) Cultural effect: differences in cultural patterns among the SC members may represent a barrier for communication and understanding of what the strategic KPIs for the whole SC are. These difficulties may jeopardize the quality and amount of information being shared and, therefore, compromise the SC's overall performance both in terms of costs and service level.

f) Cooperation and trust: each enterprise in the SC has different interests and, many times enhanced by the cultural differences, interest conflicts may occur. In these situations, opportunistic behaviors may surge and cooperation and trust may be hindered.

These aspects enhance the importance of **integration** inside the SC, since it is primordial for companies to interact and trust each other so that demand, inventory and other logistic parameters can be taken into account even by companies in other countries when planning their operations. According to Lofti (2013), the manufacturing sector needs to create, share

and disseminate up-to-date knowledge and information so that finance, material and data flows can stay properly connected in the several tiers of the SC (suppliers, producers, retailers, distributors and customers).

With the increase of global competition, companies are forced to rethink their operational structures, integrating not only externally, with other organizations that are part of the SC, but also internally among different business units belonging to the same company. Both kinds of relations are closely linked to the development of integration capabilities, since the expertise that arises from the usage of consistent shared information and application of specific information systems inside the company may provide it with the ability to also integrate externally, at a SC level.

The definitions of **integration, information sharing, coordination and collaboration** will be further explored from now on.

SC integration, according to Frohlich (2001), is an approach that seeks to coordinate and harmonize all elements of a SC, from raw material to finished product in order to achieve higher levels of overall performance and reduced cost. Complementing this definition, USAID (2011) states that SC integration is a performance-improving approach that develops seamless linkages between the various actors, levels and functions within a SC to optimize customer service. The objectives of SC integration are to improve efficiency and reduce redundancy while also enhancing product availability.

A suitable definition for SC integration is the one proposed by Flynn (2009), which refers to SCI as the **degree** to which a manufacturer strategically collaborates with its SC partners and collaboratively manages intra- and inter-organization processes. The goal is to achieve effective and efficient flows of products and services (P&S), information, money and decisions, to provide maximum value to the customer at low cost and high speed.

Supply Chain Integration can take place in basically three levels (information sharing, coordination and collaboration), depending on the consolidation depth of the integration process. Below there are the definitions and some considerations regarding these issues.

According to Mukhtar (2013), **information sharing** means distributing useful information for systems, people or organizational units. It is straightforward to understand this concept, since it is auto-explanatory. Information sharing is related to the amount and kinds of information disclosed between partners or inside a given company. Even if this practice can add value to the SC and enhance its performance, it still is a basic level of integration, considering that distributing information does not necessarily mean that the SC members are actually

collaborating with each other neither that they are jointly planning their operations, sourcing, delivery, schedules etc.

On the other hand, **coordination**, according to Zhang (2007), is the achievement of centralized and myopic optimal solutions, with an entity having the power to control most of the decisions. A classic example of this level of integration is the application of VMI, which enables the supplier to control the decision-making process regarding replenishment policies, customers' inventory levels and so on, without necessarily taking into consideration the goal congruence at the SC level.

Collaboration, according to Cao (2010), on the other hand, has a different connotation and is linked to a deeper form of integration. Besides sharing information, different members of the SC (such as a retailer and a manufacturer) work together in order to jointly plan their logistic parameters, operations, demand forecasting and so on. This provokes a more tacit alignment of objectives among the SC entities and, at the same time, requires a reasonable level of investment in Information Technologies, real-time control and data access mechanisms in order for the benefits to really surge. SC collaboration, therefore, is defined as a partnership process where two or more autonomous firms work closely to plan and execute SC operations towards common goals and mutual benefits.

Therefore, basically, there are indeed three kinds of approaches to tackle SC integration, which include some of the concepts already presented.

a) **Information sharing** (transactive): supply chain partners still have separate planning processes but share information and planning data to some degree, such as sell-out, inventory levels, planned events, replenishment programs, production capacity and so on;

b) **Coordination** (VMI, CRP, consignment stock etc - coordinative): based on the centralization of the decision-making process in just one of the SC members, aiming at homogenizing the source of data and the center of decision. VMI/CRP allows, with the same inventory level, to increase the service level and, therefore, reducing the stock-outs, it enables the reduction of lost sales, both for the supplier and the retailer;

c) **Collaboration**: enhancement of the quality of the SC planning process through the usage of each partner's specific competencies, information and data, which need to be shared in order for the supply chain processes to be successfully planned.

In Figure 3**Error! Reference source not found.**, it is possible to visualize these concepts classified according to management complexity for implementation and the level of integration each one of them provides. As can be noticed, collaboration has a much deeper

level of SC integration but, at the same time, requires more effort from the management in order to control the relationships and to access and evaluate the data being shared by the partners. The reason why collaboration is so much more complex than simple information sharing is related to the union of the planning processes. Here, demand, operations, sourcing, delivery and service plans are elaborated in unison by some of the SC members and, therefore, a bunch of conflicting interests may be put on the table during the interactions.

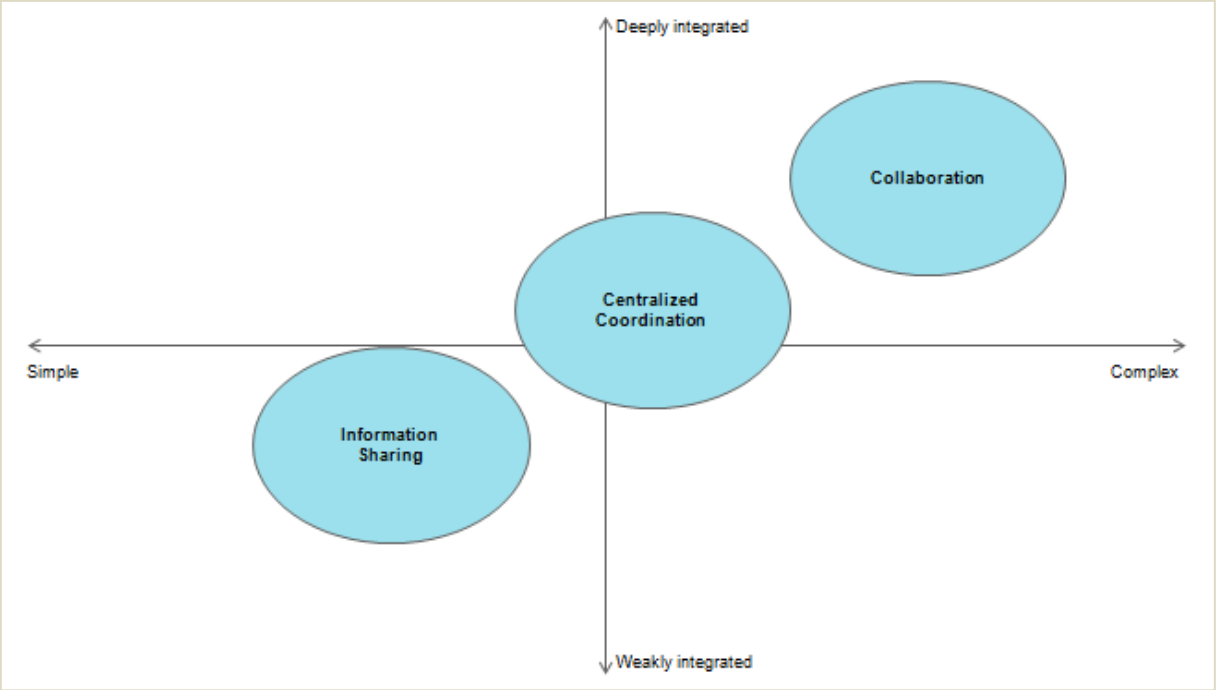

Figure 3- Levels of integration. ***Source: elaborated by the author***

It is clear that, even though collaboration and information sharing are two different concepts, collaboration is completely dependent upon the information sharing among the SC entities. In fact, according to Simatupang (2005), the culture of sharing data is the most important prerequisite for the existence of a collaborative SC. It is possible to visualize in Figure 4 a simple structure of a collaborative SC and to confirm the importance of data sharing in its structure.

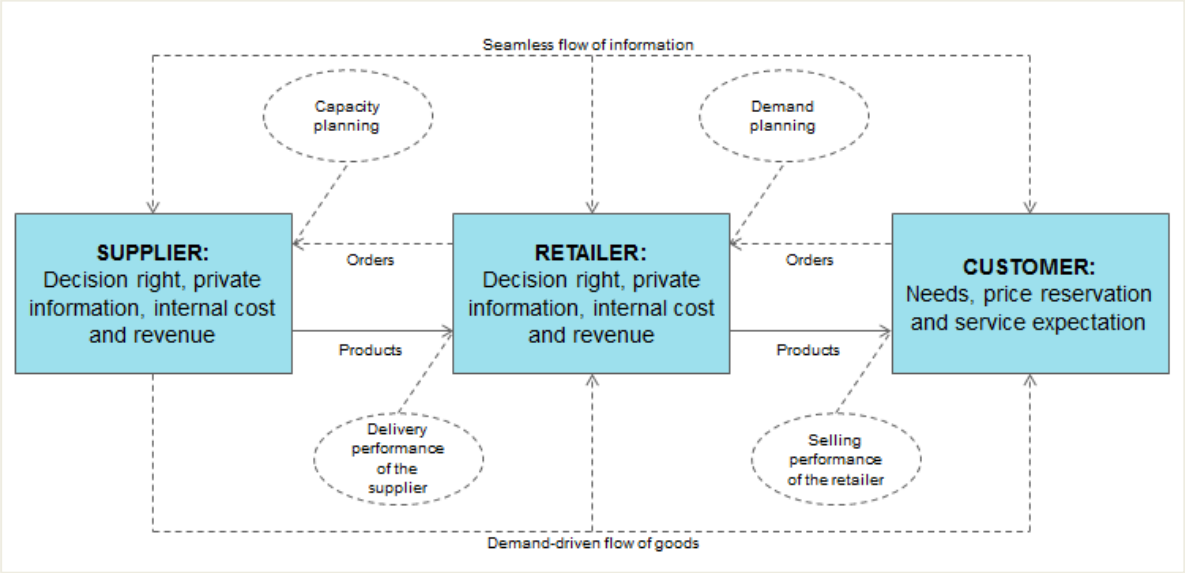

Figure 4- Collaborative Supply Chain. ***Source: Simatupang (2005)***

As can be seen in Figure 4, both the retailer and the supplier have their own power of decision and information, which can be shared for the improvement of the whole SC's performance. Collaboration requires that the decision-making process occur jointly and, as a matter of fact, this is what is shown in the diagram. Suppliers and retailers are linked and decide together questions regarding, for example, demand planning, order fulfillment, collective performance metrics and information sharing in a mutually beneficial way.

Another interesting element to be noticed in the diagram is the demand-driven character of the SC, given that downstream information is shared with the upstream players and, therefore, the bullwhip effect and, consequently, the risks faced by the supplier network are reduced. This characteristic of a collaborative SC enhances dramatically the responsiveness of the chain, once it nears the suppliers' capacity planning and portfolio design to the actual customers' demand, which is communicated through sales performance of the retailer at the point of sales.

However, the segmentation displayed in Figure 3 relates to the depth of integration across the SC, but does not present the dimensions that can be integrated when ISCM (Integrated Supply Chain Management) is pursued. Therefore, in order to analyze the kinds of SC integration that may take place, a different framework will be used, as explained below.

According to the 21st Century Logistics Framework, proposed by Stank (2001), SC integration can occur in different ways and involve several variables. The complete integration of the chain and optimization of its results in terms of costs and service level are dependent upon the levels of maturity of each kind of integration. This approach is a robust way to tackle Supply Chain Integration, since it defines specific segments to be analyzed in

order for the overall maturity of the chain to be assessed. These dimensions of integration are given in Table 1, with a brief definition of each one of them.

Integration dimension	Definition
Relationship Integration	The development of social connections between two or more entities in the SC to act as guidelines for their interactions
Measurement Integration	The development of SC-wide metrics of performance assessment that guarantee each individual business to meet its own goals without sub-optimizing the SC overall results
Technology/Planning Integration	The development and maintenance of information sharing mechanisms such as IT systems that enable collaboration in the planning processes and the connection of managers across and through the entities in the SC
Materials/Services Suppliers Integration	The linkage between the company and its materials/services suppliers in order to organize and orchestrate processes and improve the service level
Internal Operations Integration	The development of interfunctional dialogue that enables optimization of internal processes and better satisfaction of the customers' requirements
Customer Integration	The development of value-added offerings for those higher-value customers for the overall SC

Table 1- Integration dimensions. ***Source: Stank (2001)***

As could be visualized in the table, different dimensions of the SC need to be taken into account when assessing the maturity of SC integration and the partial analysis, disregarding some of the parameters quoted above, could lead to biased or incomplete conclusions. It is also important to notice that these different kinds of integration do occur simultaneously in a SC and, more than that, are often interdependent.

A summary of the constructs is presented in Table 2.

Construct	Operational definition
Supply Chain Integration	The degree to which the SC entities are interdependent and collaborative among themselves in order to achieve better efficiency and service level
Information sharing	Transactive process of distributing and displaying information across the SC
Supply Chain Coordination	Centralized decision-making process that makes one SC entity have the power to define logistic policies for adjacent members of the chain (ex. VMI)
Supply Chain Collaboration	Joint planning process through the usage of each partner's specific competencies, information and data
Bullwhip effect	Amplification of variabilities and uncertainty in the upstream levels of the SC due to distorted or lack of information

Table 2- Definition of constructs

The next part of this section is related to the potential benefits that SC Integration can bring to a chain, which should overcome the costs related to the integration design and implementation so that the overall value of the project is positive.

2.2.1 Costs and Benefits of Supply Chain Integration

Analyzing the costs vs. benefits of the integration process for a SC is a very important part of the analysis, since it is directly related to the feasibility of any integrative project. SC performance is enhanced by well-designed and implemented integration initiatives, but its application clearly depends on the initial investment required. Therefore, considering these two aspects (costs and benefits) is a must for a SC willing to integrate its business processes and improve its performance indicators.

In Table 3, it is possible to identify some of the potential costs and benefits of SC integration.

Costs	Benefits
Information systems investments	Inventory reduction and efficient inventory management
Charges by customers and suppliers for information disclosure	Changes in the marketplace may be anticipated and early problem detection
Communication costs	Quick Response
Administration costs	Better tracing and tracking
Training	Decrease of stock-out probability
	Decrease of end-to-end lead times
	Increasing visibility (significant reduction of uncertainties)
	Significant reduction or complete elimination of bullwhip effect
	Improved resource utilization
	Increased productivity and organizational efficiency

Table 3- Costs x Benefits of Integration. ***Source: elaborated by the author***

Analyzing Table 3, it is clear that the potential benefits of implementing an adequate information sharing system and collaborating with SC partners (basically related to the reduction of the bullwhip effect) can outweigh the costs by increasing the service level offered to the direct downstream clients and also to the final consumer. The decrease of stock-out occasions and the larger flexibility that integration brings to the SC structure is a real differential for the company and may define the brand perception among the customer base. This quote is even more important for those industries and products with high levels of demand and lead time variability, with clients who require more customization and responsiveness from the SC, such as the high-end fashion industry.

The benefits showed in Table 3 derive mainly from the reduction of uncertainty in the SC, which is addressed by information integration. In the traditional planning process, the SC members carry on the activities separately, exchanging only purchase orders and generating side effects such as the bullwhip effect and low synchronization of the logistic processes. These two factors cause serious inefficiencies and ineffectiveness in the overall structure and can jeopardize the players' profitability through amplification of demand forecast errors, increase of the investments in working capital (inventory) and fixed capital, increase of costs

related to emergency management (such as fast shipments and revision of the production plan) and, finally, higher probability of stock-out.

If, on the one hand, integration appears as a means to ameliorate the SC planning, on the other hand, it constitutes a risk that the company will take. Therefore, the whole process needs to be carefully analyzed so that the right amount and types of data be shared. Supply Chain integration may mean more alignment and sharing among the SC players but does not represent complete transparency and disclosure of potential core and risky information.

To analyze this issue, it is essential to delimitate the types of information that may be shared. According to Lofti (2013), there are many kinds of data that can be shared in a SC and these typologies are:

a) Inventory information;
b) Sales data;
c) Sales forecasting;
d) Order information;
e) Product ability information;
f) Information of new products;

Each kind of data shared by the company can bring different benefits from a SC perspective. Sharing inventory information, for instance, may avoid going out of stock and stock repetition. As a result, stock levels and costs are reduced and forecasts become more accurate. Sales data sharing can reduce order blow-ups, match production to the actual customers' preferences, balancing the levels of innovative products. By sharing sales forecasts, better projections may be made in the SC level, enhancing its competitiveness. Sharing order information, on the other hand, can help the faster identification of bottlenecks in the production process, what has the potential of improving the service level offered to the customer. Information regarding products, finally, can reduce the causes of the bullwhip effect and provide the manufacturer with more time and flexibility to conduct procurement and R&D processes.

The question that pops out after having revised the potential benefits of different kinds of information integration across the SC is related to the right circumstances to disclose data, so that each individual company does not take exacerbate risks regarding partners' potential opportunistic behaviors. According to Lee (2000), there are some constraints to be taken into consideration when sharing information with a SC partner. To protect itself from the risks related to abusive usage of key internal information, a company should be careful when

displaying data regarding production yield or purchase price of parts and, besides that, there should be attention regarding the suppliers' nature (they should not be part of the same company of a competitor, for example) and also antitrust regulations (it is forbidden for information shared with suppliers to be used by this suppliers' other clients to fix prices or compromise the industry's competitive structure).

After introducing the main typologies of SC integration, the kinds of information that may be disclosed and the benefits vs. risks associated with them, it is possible to present some reference models that can be used to assess the integration maturity levels of SC's.

2.3 Reference Models for Supply Chain Integration

This section is dedicated to the presentation of some reference models and frameworks regarding SC integration.

2.3.1 Supply Chain 4C's Model

This reference model has as its primary objective the **analysis of the SC integration maturity** through the consideration of four different dimensions regarding the structure of the planning process, the trust existent among the SC players, the quantity, quality and length of the information sharing and, finally, the goal congruence among the SC members. Each of these macro categories is subdivided in four segments, which show an overall evaluation of the integration maturity of the SC. It is important to notice that all of these elements are directly related to the level of interdependence among the players.

In Table 4, it is possible to identify all these subcategories and to understand the basic framework. In order to interpret it, the first concept to be clarified is **interdependence**. According to Bantham (2003), a SC structure is considered to be an interdependent set of companies, which is a prerequisite for the long-term success of SC partnerships. Interdependence plays this essential role in the SC integration because it wraps the whole structure as a unique system, which pursues common goals and shares information and resources with that in mind. In a nutshell, interdependence refers to how attached the performance of a single player is to the overall SC.

Supply Chain Configurations	Interdependence			
	Form		Depth	
	Decision-making process	**Trust**	**Information sharing**	**Goal congruence**
Communicative	Myopic, parity-based	Reliability	Sporadic, nearest-neighbor basis, transactional data	Absence
Coordinated	Myopic, asymmetric	Deterrence-based and reliability	Supply-chain-wide, transactional, procedural, R&D data for primary objectives of the channel captain	Moderate
Collaborative	Dyadic, parity-based, centralized	Reliability, competency and goodwill (openness)	Supply-chain-wide for focal function, nearest-neighbor basis otherwise	Weak-moderate
Co-opetitive	Dyadic, parity-based	Reliability, competency and goodwill	Supply-chain-wide (complementors and competitors), web of relationships	True

Table 4- Supply Chain 4C's Framework. ***Source: Lejeune (2004)***

This model divides the interdependence concept in two different factors: form and depth. These two factors can be classified according to some different categories, which follow.

Decision-making process: this variable relates to the structure of the decision-making process and the level of integration that it presents. The entities can make decisions considering the overall SC structure in order to maximize the system results (dyadic decision processes) or act individually so to maximize their own gains (myopic decision processes).

Another element to be considered when analyzing the decision-making process is the importance of each SC member. According to Grandori (1995), the process can be asymmetric when dominant players have more power and can impose their own interests throughout the SC, or parity-based, when each member has the similar decision-making influence. A parity-based process, however, can be centralized (each entity has influence over

particular fields of the decision-making process) or decentralized (the decision-making power is cross-functional).

Trust: a basic element for the successful SC integration and collaboration is the belief in other parties' ethic behaviors. It is closely related to the form of interdependence existent among the players. There are some different forms of trust that can be present in a SC, listed below.

a) deterrence-based trust: the relationship is based on little knowledge and on the fear of reprisal if the trust/obligation is not respected (Lejeune (2005)). According to Sheppard & Sherman (1998), the costs of reputation default are higher than the costs of proceeding with the relationship;
b) reliability trust: trust developed from the experience over a reasonably long period of time and alignment of expectations;
c) competency trust: trust on the other party's capacity to meet commitments. This kind of trust is essential for the reduction of transaction costs related to the monitoring of the suppliers network;
d) goodwill trust: related to the parties' pro-activeness to open and share key data among themselves, based on the belief that the partners will not engage in opportunistic behaviors related to the usage of this data even if they are given the opportunity.

Information sharing: high levels of interdependence require more systemic and consolidated information sharing throughout the SC. The several types of information that can be shared have already been approached on this project, but the information sharing process can still vary depending on its length. This can be classified as an exchange between an entity and its nearest neighbor or it can be supply-chain-wide based (not only between adjacent entities in the SC).

Goal congruence: the perception of the SC as a system and the real enabler of competitive advantage for all participants tends to align the players' interests and converge the once dispersed decision-making process. This variable, therefore, aims to measure how much each member perceives his interests congruent with other entities in the chain. The model proposes three classifications, which follow.

- absence of congruence: there is not much concern regarding the SC's welfare. Individual interests may be conflicting and compromise the overall needs of the SC. Moral hazards and opportunistic behavior are likely to happen;
- moderate goal congruence: partially compatible interests among the players. According to Narayanan (2000), this can be the result of "badly designed incentives";

- true goal congruence: generally linked to the goodwill kind of trust, the true goal congruence represents the fact that each player believes that the overall SC's interests can be achieved without disregarding their own individual ones.

Based on these concepts and variables, a SC can be classified in one of the 4C's that this model suggests.

Communicative Supply Chain: the integration that takes place in this configuration is internal to each organization (cross-functional integration), characterizing, therefore, a shallow level of interdependence. The relationships normally have a short-term character and each entity works as an internal supply chain. This context compromises the development of trust among the players, jeopardizing the consolidation of suppliers and the potential benefits that come from economies of scale. A market-bidding scenario is created, with players acting, many times, against each other to optimize their own individual interests. Besides that, the lack of goodwill results in sporadic information exchange in the chain and losses arising from excessive inventory levels and poor customer service. The only information suppliers receive from retailers are the ones related to the order being placed (deadline, quantity, price etc) and there is no concern regarding demand variability and other external variables.

Coordinated Supply Chain: this configuration presents deep dependence traces, since the SC is seen as a hierarchical structure, which is dominated by a main player (or group). The exact configuration of this kind of SC depends on the industry and the market variables considered by the SCM practices. In the automotive industry, for example, the bargaining power is mostly concentrated in the hands of global manufacturers, while in the apparel industry, more and more, retailers are the most strategic players, as the industry becomes more buyer-driven. This topic will be further explored in the next sections of this report.

The point of the coordinated SC configuration is that the dominant players use their coercive power to impose their own individual interests over the whole SC. This asymmetry in the relationship leads to myopic decision-making processes and difficulties in the development of collaboration processes, since trust ends up being related to the fear of potential reprisals or boycotts that the dominant players can pursue toward the weakest ones (deterrence-based trust).

The information flow in this configuration tends to be more supply-chain-wide, since all the entities depend on specifications and the objectives of the dominant players. Even if this is better than the communication strictly between adjacent companies, it does not incentive collaboration in the decision-making and planning processes, given that the power structure is

completely asymmetric. In contrast with the communicative SC, here the dominant player may not want to throw its suppliers against each other, but, instead, just select the best one for each task (best-of-breed environment). One practical example of coordinated supply chain is the Toyota's case. Toyota creates a network of suppliers that can exchange information among themselves in order for the final quality standards to be improved, as long as it is according to Toyota's objectives and specifications.

Collaborative Supply Chain: this configuration is shallowly interdependent. Here, companies collaborate among themselves, making their complementary assets available so that the common objectives defined for the SC be achieved. This enhances the dyadic character of the decision-making process and increases the amount and the quality of the information being shared throughout the SC. The collaboration is performed at a function level, with specific focal functions to be approached by the SC planning. This increase of integration reduces the bullwhip effect (the more upstream in the SC the entity is located, the larger the variances).

Even if the collaboration is more evident in this configuration, the goals are not still completely aligned in the SC level, what can hinder goodwill among the players (trust that, even if given the chance, the other party will not engage in opportunistic behavior).

Co-opetitive Supply Chain: this configuration has a deep level of interdependence and lies on the idea that competitors can have win-win relationships with each other. Here, as in the collaborative SC configuration, the decision-making process is dyadic and parity-based, with explicit common goals across the whole SC. The exchange of information tends to be more complex than in other configurations because the scope is bigger here, with competitors also included in the SC network. Through processes such as lateral transshipment (inventory transfer between competitors, at the same echelon of the SC network), a leaner and more agile SC can be created, with better flexibility and responsiveness. For mechanisms such as lateral transshipments to be successful, the information flows need to be extremely advanced and integrated, nurtured by all entities in the SC and, according to Greis & Kasarda (1997), viewed as a web of exchange.

2.3.2 Supply Chain Operations Reference (SCOR)

SCOR is a framework that provides organizations with benchmarks to describe and configure integrated SC's. This model divides the overall chain in five key processes: plan, source, make, deliver and return. In addition to that, it is important to emphasize that even if the SCOR model has an operational-process perspective, it can also be used to tackle SC

integration topics, once it assesses aspects such as planning procedures, information sharing and so on.

The most common usage of the SCOR model is related to the **SC performance assessment** in terms of the main phases that take place from sourcing until the delivery of the product to client. The analysis for each of the five phases is conducted through the collection of specific logistic indicators; some of them will be displayed on this report.

The key processes proposed by the model are briefly explained below, based on the definitions given by Zhou (2011).

a) Plan: this business process has as its main objective the alignment between demand and supply and includes all aspects related to demand and supply planning, such as assessing supply resources, prioritizing demand requirements, planning inventory and distribution requirements for all products and channels. The idea of the model is to show that the planning activities have significant positive influence on other processes, such as sourcing, manufacturing and delivery. Planning involves, firstly, different business units of the company, making interfunctional coordination within the firm critical for SC planning. The second level is the interorganizational integration, which enables good-quality data to be shared and wide-SC optimizations to take place.

   Some indicators that can be collected for the analysis of the "plan" dimension are the demand forecasting practices and errors, process schedules elaboration and level of processes documentation. Besides these ones, it is possible to assess the integration level in the SC through some specific information such as the existence of a cross-organization team, the degree of participation in customer/supplier relationships and previous jointly definition of customer and product priorities.

b) Source: refers to the procurement of goods and services. Establishing long-term supplier-buyer relationships and reducing the supplier base are encouraged sourcing practices and very likely represent higher levels of SC integration and alignment of objectives. Some indicators that may be taken into consideration are the level of IT support for the sourcing process and the degree to which inter-supplier relations are consolidated. In order to understand the level of collaboration in this dimension, it is interesting to assess the existence of a sourcing plan with the suppliers, as well as the frequency that inter-organizational communication takes place (feedback, performance measurement etc).

c) Make: refers to the transformation process, which turns raw materials into finished goods and services according to the demand planning. The SCOR model includes four groups of practices for the "Make" business process, which are Just in Time (JIT), Total Preventive Maintenance (TPM), Total Quality Management (TQM) and Human Resource Management (HRM). Each of them has different focuses in order to increase productivity and motivate the employees and they can happen simultaneously, enhancing different aspects of the production process at the same time. The indicators to be considered here are related to suppliers' lead times, the access to customers' plans and schedules and the collaboration level for the elaboration of production plans.
d) Deliver: refers to all the processes that provide finished goods according to the quantity and typologies defined in the demand planning phase. One very important issue of the "Deliver" process is the ability to track orders, which is directly enhanced by the sharing of real-time information. Besides that, another critical characteristic that is being required from the globalized companies is agility, that can be promoted by Internet-based delivery systems. When it comes to assessment indicators, some interesting ones are track on time customer orders, the level of stock-out occasions and capability to respond to unplanned orders
e) Return: refers to the process of the reverse product flow in the SC, linked to problems regarding quality patterns, specifications or reverse logistics.

It is possible to visualize that all the key processes defined by the model are dependent of the planning activities. Therefore, according to the SCOR reference model, the largest opportunity for SC integration and optimization of the service level comes from the collaboration in the planning activities and in the decision-making processes.

2.3.3 Collaborative Planning, Forecasting and Replenishment (CPFR)

The CPFR model, as the other ones presented in this project, aims to improve the visibility of the SC through the continuous enhancement of the forecasting and fulfillment processes (match of the supply and demand). This reference model can be used to assess the degree of SC integration through nine steps, which attempt to provide a **road map for applying SC collaboration**. These elements are listed below.

a) Develop front-end agreement;
b) Create joint business plan;
c) Create sales forecasts;
d) Identify exceptions for sale forecasts;

e) Resolve and collaborate on exception items;
f) Create order forecasts;
g) Identify exceptions for order forecasts;
h) Resolve and collaborate on exception items;
i) Order generation.

The list presents a logical sequence for the collaboration process. From an initial alignment of business expectations and the jointly creation of a business plan, forecasts and order requests are elaborated, always with inputs coming from both the supplier and the retailer when exceptional situations occur. If the integration model is the n-tier type, as will be explained below, more than these two SC levels are involved in the decision-making process and, therefore, the overall SC structure is more difficult to manage but, at the same time, more goal congruence can be achieved.

The CPFR model basically depends on the comparison and negotiation regarding data of two or more SC entities and of current and past situations in order to track exception situations and to align different players' business strategies around common SC-wide metrics. The management by exception promoted by the CPFR model enables bilateral reactions by the SC players involved so that they can decide together potential corrections in the sales forecasts or the replenishment quantities.

Another interesting characteristic of the CPFR model is that, even though it has evolved from traditional integrative tools such as VMI, EDI and ECR, it has a larger scope, benefiting all the SC entities involved through the usage of more interactive communication processes. The model can promote different levels of integration, which can be visualized in Figure 5 .

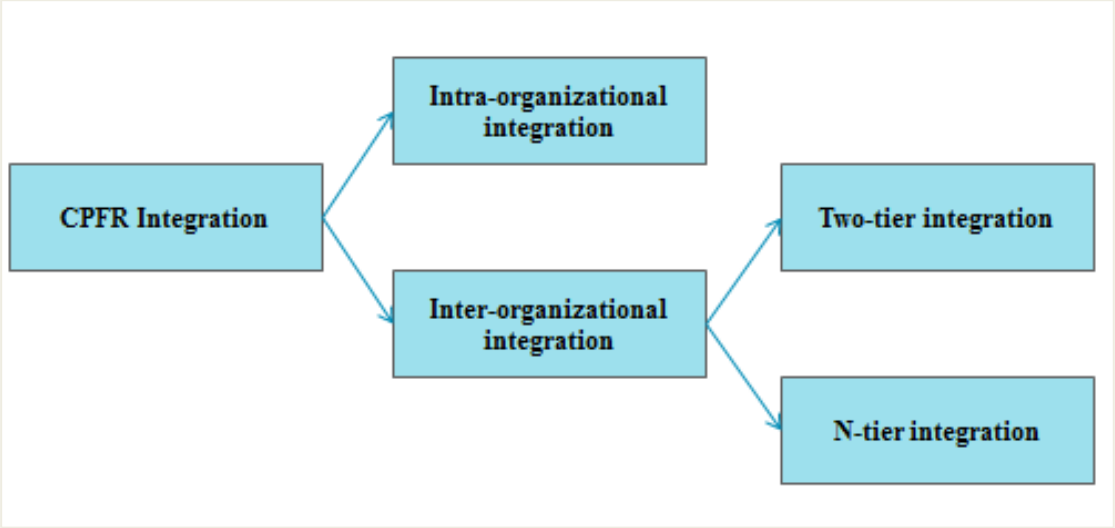

Figure 5- Levels of integration for the CPFR model. ***Source: Simatupang (2004)***

The diagram shows different manifestations of SC integration according to how broad the process is. The intra-organizational refers to the integration among different business units of the same company. On the other hand, the inter-organizational integration is the one across vertical supply chain links and it can be further segmented in two-tier integration, focusing on the relationships of only two echelons (typically the manufacturer and the retailer), and n-tier integration, which involves more than two echelons across the chain and has as the main objective the reduction of the bullwhip effect.

The creation of specific metrics to assess the maturity level of the implementation of those nine parameters can provide information regarding how integrated the SC really is, both in strictly adjacent echelons and throughout it. These metrics can relate to the amount and kinds of information being shared (specifically availability of points-of-sales data), the development of control systems to identify exceptional situations, assessment of goal congruence and the existence of team dedicated to the creation of joint business plan.

2.3.4 Collaborative Supply Chain Framework (CSCF)

According to Simatupang (2005), CSCF is a framework to explain the key factors that influence the existence and success of a collaborative SC. In the model, there are five key factors that act as the core of any collaborative SC and they are represented in Figure 6. It is important to notice that they relate to each other, being interdependent and positively proportional.

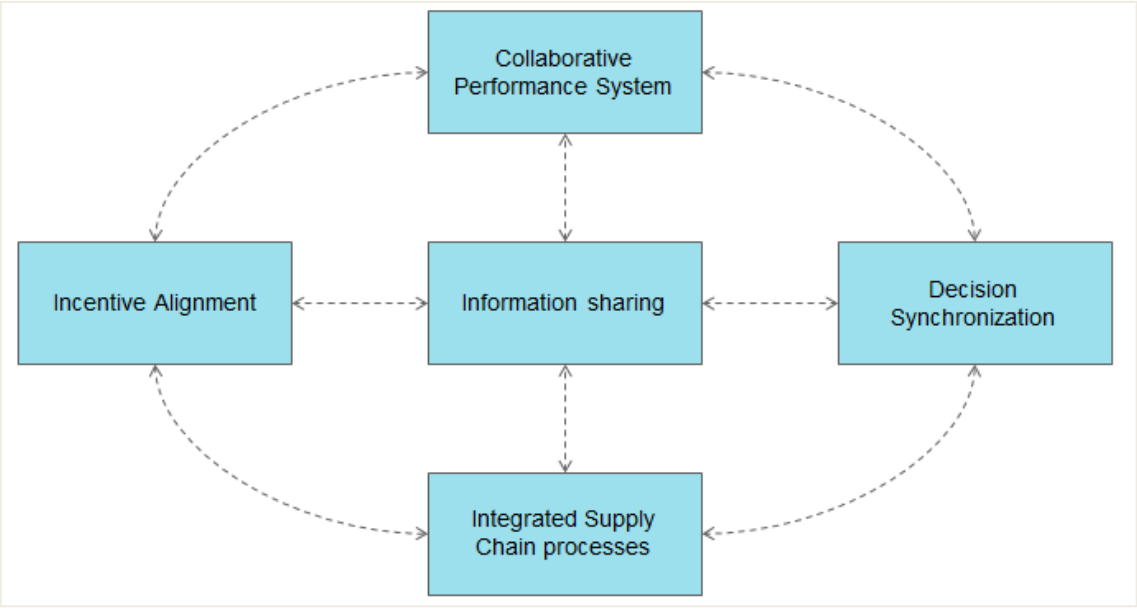

Figure 6- CSCF Model. ***Source: Simatupang (2004)***

Collaborative performance system (CPS): this parameter is characterized by the implementation of performance metrics aimed at improving the overall SC outcomes. One of the main issues here is related to the SC's mutual objective, which refers to the competitive factors that can be achieved if the chain members engage in collaborative relationships. The approach to the mutual objective issue depends on the following questions:

a) Who should be involved in determining the mutual objective?
b) What performance metrics should be specified with respect to the mutual objective?

Each of the chain members has different needs in terms of performance metrics, what has led Simatupang (2005), to propose two dynamic learning cycles that enable SC members to assess their performance at different managerial levels.

a) Exception cycle: the objective is to enable rapid response in fulfilling customer demands and protect sales from unexpected market disruptions. The main activities in this cycle are monitoring triggering events (inventory level, deadline, demand conditions), detection of external difficulties that may jeopardize the supply chain execution, diagnosis of the causes of potential malfunctions and corrective actions. Basic metrics could be delivery time, order conditions, inventory velocity and existence of corrective control mechanisms.
b) Improvement cycle: refers to initiatives focused on the SC's continuous improvement. Here, the main activities are identifying improvement targets, designing improvement plans and weighting the spectrum of improvement options. Basic metrics here could be forecasting accuracy, flexibility and responsiveness.

CPS depends on the effectiveness of other features of the model, such as information sharing, decision synchronization and incentive alignment, so that it can monitor and improve current performance.

Information sharing: refers to the possibility of monitoring the products as they go through the SC phases, via access to partners' systems and data. The typologies of information here include demand conditions, end-to-end inventory status, order status, costs and performance status. According to the model, access to strategic pieces of information broaden up the scope of the decision-making process and, as a consequence, allows SC member to address issues more quickly and be more responsive to changes of the demand patterns.

Information sharing acts as a gatherer of the other features of the model, since good-quality data is the main input for a better decision-making process and, therefore, for a more transparent SC.

Decision synchronization: refers to the members' capacity to synchronize critical decisions regarding the SC's performance. The importance of this issue is related to the fact that each chain member has its own competencies and expertise. Some of the themes covered by joint decision making are sales and order forecasts, inventory, replenishment, order placement, order delivery, customer service level and pricing.

Incentive alignment: refers to the sharing of risks and benefits among the SC members. Mechanisms such as pay-for-performance and pay-for-effort can be present as a means of aligning expectations and pushing SC members to act jointly. Both these schemes are based in the premise that adequate incentive mechanisms will motivate the entities to act together and on behalf of the SC's overall performance.

Integrated supply-chain processes: refer to the level of efficiency of the processes designed by the SC members. The focus of these processes should be on flexibility, since the ability to respond to a bunch of varieties of customer requirements is one of the main differentiators of current SC's.

The analysis of all these features and the interconnection that exists among them can give a clear description of the collaboration scenario that a SC possesses. Objective metrics could be defined for each one of the features so that measurement and eventual comparison can be easily conducted; such metrics would involve specific parameters related to each dimension and also logistic performance indicators so that the combination between the collaborative and logistic elements could be made.

2.3.5 Comparative Analysis

As for this section, a comparative analysis among the four reference models presented above is conducted so that it is possible to understand which the most suitable one is for the **assessment of the integration degree that a given partnership presents.**

Even though all of them are related to SC integration, each one has a quite different approach and is more useful to specific and distinct objectives.

The SC 4C's model is suitable for the **evaluation of the integration level** across different enterprises belonging to a given SC. The scope of this framework has as the object of study an established SC, with consolidated members and relations, so that the four dimensions can be used as a reference for the assessment of the current maturity of the integration process.

Therefore, the usage of this model is related to an exploratory approach, focused on the understanding of the current SC situation, without necessarily linking the depth of integration to the SC's logistic and financial indicators. It can be rightly concluded that the application of the SC 4C's model bends to more theoretical and research-driven objectives.

The second framework is SCOR. The usage of this reference model has a different scope than the 4C's. Here, as could be noticed in the SCOR section of this report, the major concern refers to **SCM practices in the five designated process dimensions**. Instead of focusing on SC integration, as the 4C's model, SCOR considers the optimization of practices at a macro process level. This model is very effective for **SC performance assessment**, proposing the collection of key logistic and financial indicators so that a pragmatic evaluation of the SC's costs and service level can be designed.

SCOR may be used for establishing the relation between current SCM practices and performance gaps, so that opportunities for improvements and better levels of integration can be identified and pursued.

The third model is CPFR. Here, the scope is a mix of the first two. The approach taken by this model is the **identification of a road map to consolidate collaboration** practices and values in the SC. While the 4C's model proposes a framework to assess integration and SCOR is effective at measuring performance and identifying pain points, CPFR presents an exception-management policy, according to which SC entities need to be aligned and collaborate with each other to get back to normality and provide the adequate service level to end customers. The ideal purpose of the CPRF, therefore, is the **implementation of collaborative SC** in two pillars: demand forecasting and replenishment policy.

Finally, the last model presented on this report is the CSCF, which, at the same time, represents a framework for SC integration assessment and implementation. The model provides dimensions to be considered when integrating the chain, with some overlapping with the concepts proposed by the 4C's model. **The objective is to identify core elements necessary for a collaborative SC to be successful**. Therefore, this model is a natural continuation of the CPFR. While the latter proposes a road map for collaboration implementation, the first tackles how to achieve the CPFR elements having the five proposed dimensions as reference.

Knowing that the scope of this project is to assess the current state of SC integration and to correlate it to performance indicators, an interesting combination would be to apply the SC

4C's model to evaluate the level of integration according to the four dimensions and the SCOR framework to identify key indicators related to SC performance.

3 The Apparel Industry

During the research about SC integration models and practices, it was remarkable that the apparel industry appeared several times as benchmark of integrative initiatives, having obtained big financial benefits and more SC responsiveness (especially in the high-end segments) through the successful implementation of adequate SCM practices. The potential gains that this particular industry has are well presented by Sen (2008), who elaborated a complete SC review analyzing the fashion industry in the US. This study concluded that the industry's short product life cycles, huge variety, with volatile and unpredictable demand and consolidated supply processes make it a "sustainable avenue for efficient SCM practices regarding integration".

In addition to that, the apparel industry becomes even more interesting taking into account the expertise that Italian manufacturers and designers have in this segment. With the growing trend of internationalization of companies and brands, it is fact that Italian and Brazilian products are moving towards external markets to increase the customer base and profitability.

Considering all the facts above, it seems that the apparel industry may be an interesting field of study to analyze the level of maturity of the SC given the SCM practices that are being put in place. Figure 7 shows the evolution of commercial flows in the apparel industry between these two countries.

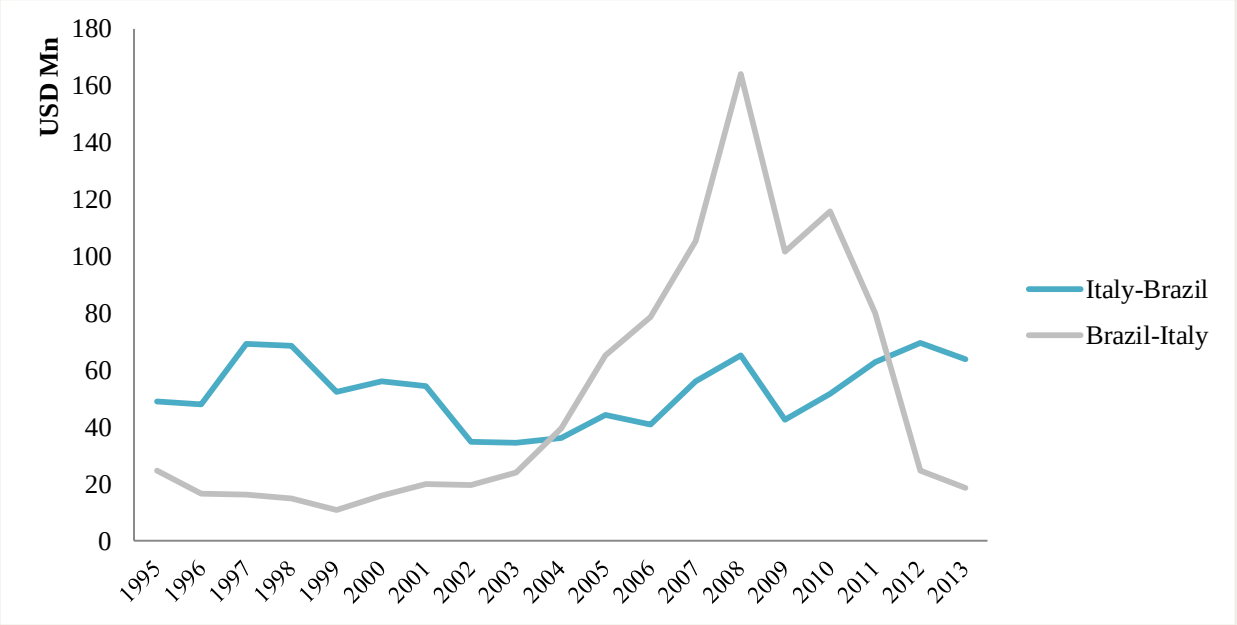

Figure 7- Bilateral Apparel Exports. ***Source: UnctadStat***

As can be seen, the flows are very variable, what may indicate external economic factors such as supply shortage, tariffs, quotas etc and also internal inefficiencies related to the SCM of

these chains. Even though in the last years the flow originated in Italy may be larger, historically, there was a time when Brazil was exporting big quantities of apparel-related products to Italy, basically pushed by the boom of the footwear segment. After about five years from the beginning of the increase of the Brazilian exports, the flow began to decrease and, nowadays, is back to the same pattern from before. This scenario is not positive but has two characteristics that are worthy of attention:

a) there is potential for the Brazilian exports to increase since the Italian demand exists, as the graph historically proves;

b) internal inefficiencies may be the cause of the reduction of the flows, given the increasing openness of Brazilian commercial relations with the EU. It is not likely that economic caps or external limitations be the main cause of the shortfall of the Brazilian exports towards the Italian market.

The other part of the graph is related to the Italian exports to Brazil. Here the analysis is different from the one presented before, because, even though there are constant fluctuations, they are not as big as the Brazilian one. However, even if the niche has not been sharply decreasing in the last years, the scenario is not positive here either. There is no evidence that, in fact, Brazilian demand matches with what Italian apparel companies are offering, considering that there has never been a sharp increase of the commercial pattern in this perspective.

What should be considered here is that there are different segments in the apparel industry and this may cause Italian offers to match with Brazilian demand in some specific niches, probably more related to higher-end segments of the market. This may represent an opportunity for companies that are inserted in these niches to increase their customer base in Brazil, a country with a growing middle class and purchasing power.

Therefore, in order to better analyze how interesting it is for Italian companies to export to Brazil, it would be interesting to understand how promising the apparel industry in Brazil is, so that Italian manufacturers may consider facing the risk of entering the market based on its potential, even if there is not a long-term bilateral relationship pattern between these countries for this specific industry. This analysis is provided next.

3.1 Attractiveness of the apparel industry in Brazil

Brazil is among the eight largest apparel markets in the world and it is the one that grew the most in the last ten years. The Brazilian apparel market had an average CAGR of 8% from 2007 to 2012, considering that the sales of clothes, footwear, sportswear and accessories represented around 75,8% of the whole market value.

At the same time, the supply of imported goods in the Brazilian apparel market is increasing continuously, having gone from US$148 mi in 2003 to US$3,5 bi in 2013 (a CAGR of 137%). Moreover, currently, about 15% of the total apparel market is supplied by international brands, against only 2% ten years ago.

Besides the visible growth and size of the Brazilian apparel market, there are other factors that come into play favoring the foreign entrance in this scenario, such as a culture that embraces the concepts and innovations that international fashion brings (Brazil has one of the five most important fashion weeks in the world) and the discovery of the "pré-sal", which makes the country a potential exporter of synthetic fibers and, therefore, very interested in global fashion trends and demands.

Regarding the distribution channels, as can be seen in Table 5, there is a high degree of concentration of specialized and independent stores. This can be a good match for the concept of "made in Italy" imports, still incipient in the Brazilian market and, therefore, can represent an interesting niche for a potential Italian apparel exporter.

Retail distribution channels in thousands of pieces				**Share of total**		
Retail distribution channels	**2007**	**2011**	**Var**	**2007**	**2011**	**2025 (p)**
Specialized stores	1,4 mi	1,96 mi	36%	27,5%	30,1%	36,8%
Non-specialized stores	0,37 mi	0,56 mi	54%	7,0%	8,7%	16,4%
Hypermarkets	0,37 mi	0,50 mi	35%	7,1%	7,7%	9,2%
Small stores chains	0,77 mi	1,02 mi	33%	14,7%	15,7%	17,5%
Independent stores	2,3 mi	2,24 mi	7%	43,8%	37,8%	20,1%
Total	**5,25 mi**	**6,52 mi**	**24%**	**100,0%**	**100,0%**	**100,0%**
Participation of imported goods	3,9%	9,4%	141,0%			

Table 5- Distribution channels. ***Source: IEMI. Note: (p) Projection Abit***

Furthermore, the luxury segment in Brazil, particularly, is very promising. In 2012, this industry was worth around USD 10 million and has been growing an average of 8% annually ever since. It is expected that, until 2025, Brazil will represent 6% of the global luxury market, what would be an excellent fit for Italian manufacturers inserted in this segment aspiring to expand their customer base.

Therefore, also from the Italian perspective, there is a promising scenario for the Brazilian apparel market and, thus, it makes sense for an Italian manufacturer to consider investing in Brazil.

3.2 Characteristics of the apparel industry

The value chain of the apparel industry is basically composed of five stages, which have very different functions in the production and distribution phases os the SC. They can be seen in the diagram that follows.

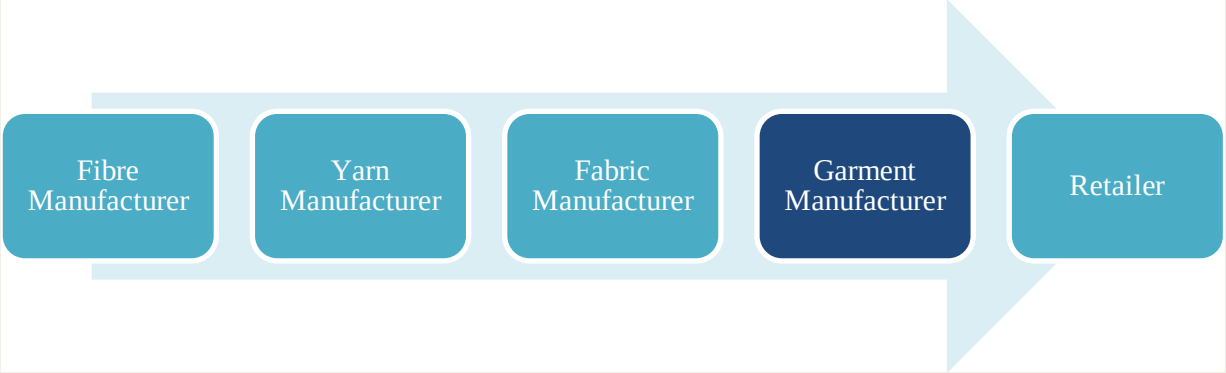

Figure 8- Textile/ apparel industry Value Chain

As this projects focuses only on the apparel industry, the other stages of the value chain will not be approached here. A brief analysis regarding this specific industry is conducted in this section so that the results of the survey can be analyzed inside a given context and scope.

The apparel industry is very diverse. It has three big market segments. This happens, basically, as a result of different demand patterns, determined by regional habits, divergences in purchasing power and subjective behavioral elements related to the purchase of clothes and fashion accessories. These three types of demand are displayed on Figure 9.

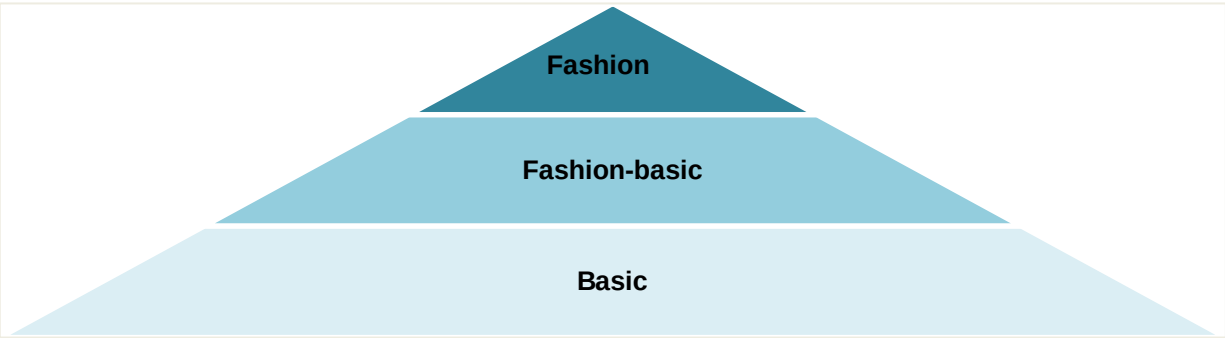

Figure 9- Segments of the apparel industry. ***Source: Daspal (2004)***

These three segments are related to different customer profiles and have specific characteristics in terms of demand volatility and customer needs. The “basic product” category refers to the mass-inclined market. For this type of product, normally the most

important driver for the client lies on the pricing point and, therefore, the brands inserted in this niche tend to optimize internal processes in order to increase efficiency and to save money on raw material. On the other hand, the demand uncertainty for this niche is moderate and the flexibility required from the SC, not very high, since the product lifecycle is long and the vulnerability to fashion trends is not so pronounced as in the case of more customized products.

The second market segment is the "fashion-basic", which is related to more personalized products, aiming at a more classy market, composed by customers with higher purchasing power and fashion style, who are willing to pay more for status and quality differentiation. The SC needs to adapt to this different dynamics of the targeted market through higher levels of flexibility, customization (make-to-order, for example) and service level (lower time-to-market periods).

The last segment is the "fashion". This one is the most premium and requires a very flexible SC. Here, the consolidation of suppliers and the cross-enterprise integration of processes and information are key activities in order to achieve the service level the customer expects. The lead times need to be lower and the perception of exclusivity is a very important driver of this niche. Considering the customization involved in the products of this segment, the demand volatility is much higher than in the other two market niches. The companies in this segment tend to act more vertically, at least when it comes to their core products, so that they can have more control over the products quality, distribution and concept development.

These elements are broadly discussed by Brun (2008), who proposes a portfolio of SC strategies according to the characteristics of each specific family of products of the company. Basically, he assesses the impact of product, brand and channel characteristics in the definition of the optimal SC, quoting that the SC should be extremely reactive for products with shorter lifecycle, whilst cost-efficiency approaches should be pursued for those with longer lifecycle. The same rationale is also applied for the brand impact, i.e., the higher the brand positioning, the stronger the need for high service level and so on. Therefore, the more value-driven the market, the more reactive and flexible the SC needs to be. On the other hand, the more cost-driven and elastic the demand, the more cost-efficient the partnership structure should be.

There is a real challenge for companies belonging to the top two niches, since they need to build a SC structure that is, at the same time, efficient and effective. It is essential for them to provide flexible, fast and adaptive SC's so that customers can have high-end products at the

right time through the right channels. It is extremely important as well to ensure that the costs related to the management of flows in the SC be competitive so that the company can keep the high margins of sales to itself and not share them, for example, with intermediary players such as distributors, exporting agencies etc.

Companies belonging to the mass segment, on the other hand, need to focus strongly on cost cutting and optimization of processes. Therefore, some interesting strategies often adopted by these players are order consolidation, usage of low-cost transportation means such as ships, sourcing in lower-priced countries, such as the ones in East Asia for the apparel industry and so on.

The search for cost optimization in the industry has pushed it to change in the last decades, providing incentives for the transfer of the supplier base offshore and the elimination of non-core internal activities in such a way that companies of the apparel industry are, more and more, **horizontally** alligned. This makes SC integration a very important issue for the industry: with the larger division of activities among different partners, integration of information and process synergies are extremely strategic for the efficiency and effectiveness of the SC.

The existence of a more horizontal industry has good and bad consequences though. Internally, it is interesting to cut costs and focus on the core activities, in such a way that it becomes possible to maintain a lean structure and profit from the elements that really add value to the brand. However, on the other hand, the split of functions among different partners originates asymmetries of bargaining power and of the decision-making process. This is visible in the apparel industry through the increasing importance that the retailers assume in the SC, mainly in the mass-inclined market niche, which constitutes a buyer-driven industry.

As has already been explained when the SC 4C's model was presented, the existence of a strong player that dominates the others can generate lack of trust and goodwill between the parties, considering that the supplier (in this case, the manufacturer) will have a shallow partnership, built according to the limitations of deterrence-based trust and asymmetric decision-making power. Ultimately, this concentration of bargaining power creates a myopic structure, which will potentially meet the interests of the major player and undermine the smaller players' ones.

This becomes even more noticeable in the global scenario, where partners are often located far away from each other, what makes it more difficult for them to integrate and collaborate in a win-win partnership. As the most immediate result, the player with more influence in terms of size, industry impact, relative concentration etc. has the say of how things run. This hinders

the potential development of the smaller partners and also causes inefficiencies in terms of costs (higher scrap rate, devolution, stock-out occasions and so on).

In this context of global sourcing, there are basically three stages of development for a generic company in the industry, which are described below.

a) Assembler: form of industrial subcontracting in which garment sewing plants are provided with inputs for assembly;
b) Original equipment manufacturer (OEM): the supplying firm makes a product according to a design specified by the buyer. The product is sold under the buyer's brand name. The buyer lacks control of distribution;
c) Original brand name manufacturer (OBM): upgrading by manufacturers from the production expertise of OEM to first the design and then sale of their own brand products.

In the apparel value chain, lead firms use different networks and source from several parts of the world. Retailers, for example, tend to rely on full-package sourcing, buying ready-made apparel generally from Asia. On the other hand, branded manufacturers tend to create production networks that focus on apparel assembly using imported inputs and that are normally more regional than those created by retailers.

It is important to highlight that the apparel industry is an extremely fragmented market, with many small manufacturers supplying larger brands or even other manufacturers that outsource part of the production. This is determinant when the distribution of bargaining power in the market is analyzed. Since there is a lower relative concentration of retailers and larger enterprises than small garment manufacturers, it is difficult for partnerships to take place in a win-win environment. In order for this to happen, the more powerful organizations, such as international brands or even textile companies located upstream in the SC, need to consider a strategic move to consolidate partnerships with the other players of the SC, such as smaller suppliers or clients.

Through the consolidation of the partnerships, the SC-leading players can improve the partners' internal processes and help them become more efficient. In time, this relation can improve the companies' role in the industry as a whole through the upgrade of its function in the value chain. As was displayed before, there are three main positions that a company can have in this industry: assembler, OEM or OBM. With help from its major partners and even profiting from a potential bank effect that can take place in the partnership (the bigger

companies can invest in the smaller ones, lend money with lower interest rates and so on), it gets easier for a player to develop internally and assume new roles.

An example of this situation could be a garment manufacturer that begins its activities as a simple assembler, receiving inputs from its customers' suppliers network (many times located offshore) and working on specific assembling activities, without much autonomy to make decisions regarding design, possibility of outsourcing and with little information sharing with the partner. As the role of this assembler becomes more strategic for the leading company, more responsibility is delegated to its production process so that, more and more, it can play more systemic roles in the SC.

As trust is built in the partnership and the leading company believes that the partner is capable of delivering good-quality products consistently, it is possible for investments in the partnership development to be made. With higher levels of integration between the two players, the assembler can become an OEM, with the power to select its suppliers base, how to conduct the production process and so on. However, the design is still an input from the leading partner that needs to be met by the final deliverables.

As an OEM, the company develops much faster and has the opportunity to learn essential capabilities on the job. The leading partner, on the other hand, acts as an enhancer of the partnership development, helping its supplier to develop strategic abilities and even acquire assets that will add value to its production process and final results.

This possibility of development through synergies with strong partners can lead a company to acquire the elements necessary to improve its position in the value chain and to increase its own bargaining power in the industry. As this process goes on, it is possible that the OEM becomes an OBM, manufacturing own-branded products and focusing on more strategic phases of the value chain, what leads, ultimately, to a more horizontal structure and cost-cutting procedures with non-core activities, which can be easily outsourced to assemblers or OEMs.

This whole point shows how benefic SC integration can be for a company to grow in the industry and increase its revenues based on the initial synergies it has with well-positioned partners. On the other hand, it is also strategic for leading companies to engage in partnerships with smaller manufacturers, since this relation represents the possibility for these lead organizations to reduce their cost structure and focus on strategic core activities, such as design and innovation. Their brands, at the same time, do not suffer any damage since the products bought from an assembler or OEM continue being sold under the name of the

leading partner with quality standards and consistency of results guaranteed by the close contact between the partners through SCM integration best practices.

Figure 10 displays this cycle of development in the apparel value chain, as described before.

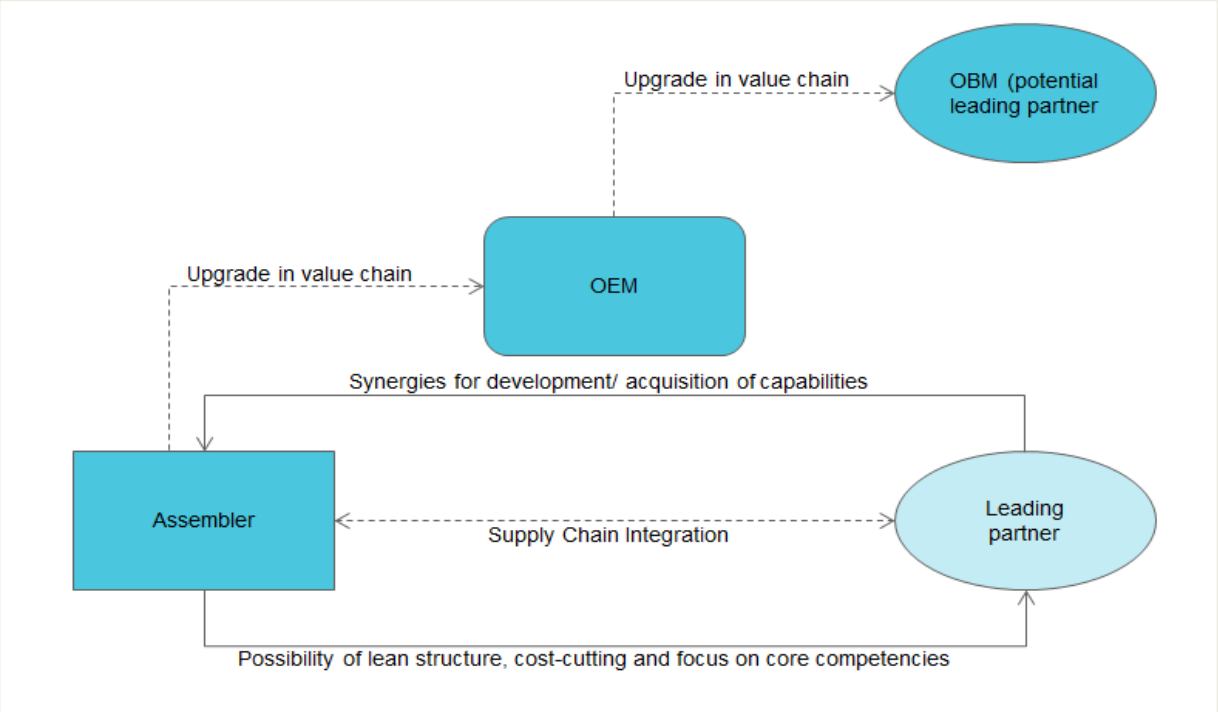

Figure 10- Effects of integration in the apparel value chain. ***Source: elaborated by the author***

After this introduction regarding the main characteristics of the apparel value chain, the next section is destined to the design of the questionnaire.

4 Method

This section aims at designing the questionnaire to be sent to Brazilian and Italian exporting companies in the apparel industry.

4.1 Research Questions and Survey Methodology

Having revised the literature regarding SC integration practices and studied the apparel industry, it is possible to understand which the key research questions are. Considering the points that have been leveraged throughout this report, the main topics to be taken into account are the level of integration that the SC being analyzed demonstrates and how these practices are reflected in the members' performance indicators. The research questions follow.

a) How integrated are partnerships in the Brazilian/Italian apparel industry?

b) What are the main benefits and challenges of partnership integration?

As presented before, it is reasonable to consider that these two topics are essential issues for SCM, given the increasing trend of integration and the need for entire SC's to compete against each other instead of individual companies.

The next step is to determine how to answer both of these questions. In order to do so, two potential methodologies could be applied to obtain the information necessary.

The first one is a multiple-case-study approach. Knowing that it will be necessary to study the integration level and its relation with performance indicators, it is clear that a sample of companies is necessary so that a significant amount of data is available for the analysis. Considering, as well, that a case study involves a deep study regarding each company's environment, problems and potential opportunities, it becomes quite unfeasible to conduct a multiple-case-study approach in this project.

The second one is the **survey**. This possibility is more coherent with the scope of the project and the time availability involved in its realization. As has been highlighted in the formulation of the two research questions above, there are two dimensions which the survey will focus on: the identification of how integrated the company is in the SC's it is part of and, after that, how the level of integration identified impacts on the company's results in terms of performance indicators.

The pros and cons of conducting a survey also need to be taken into consideration so that potential distortions do not jeopardize its validity and credibility. To tackle this analysis, the first step is to clarify the three major kinds of survey. They are displayed below, according to the definitions proposed by Malhotra (1998).

a) Exploratory research: this kind of survey focuses on the exploration of the phenomenon, allowing for a better understanding and identification of key issues and variables. Generally, the results of this kind of research can be refined in order to track new dimensions of interest, once at the beginning of the process, the actual problem had not been clearly defined yet.
b) Descriptive research: seeks to provide a description of observations of a phenomenon. After the beginning of exploration of a new field, more information is needed in order to fill the gaps and expand the understanding about the subject and this is where descriptive research occurs.
c) Explanatory research: this kind of research is dedicated to identifying causal relationships among different variables. The whole research is based on premises (or hypotheses) that guide the process of literature review and formulation of the questionnaire. The objective of this type of research is to hypothesize, explain and test a specific phenomenon. The final results can be used for the development of a theoretical model, for example.
Considering the nature of the research questions, it makes sense to assume that this survey is an **exploratory/descriptive research**, since the objective is not to explain a specific hypothesis through a theoretical model. The actual goal here is **to understand and assess the phenomenon** (Supply Chain Integration and its relationship with the company's performance) according to the dimensions proposed by a chosen reference model, considered the most suitable one according to the scope of the survey.
Being an exploratory research, it will not be necessary to design hypotheses to be tested. The mere objective quoted above is already enough for the formulation of the questionnaire, which will be approached ahead on the report.

Having defined that the study will be an exploratory research about the level of partnership integration and its relationships with company’s performance, the next step is to discuss the survey methodology. The framework to be considered for the survey elaboration is the one in Figure 11.

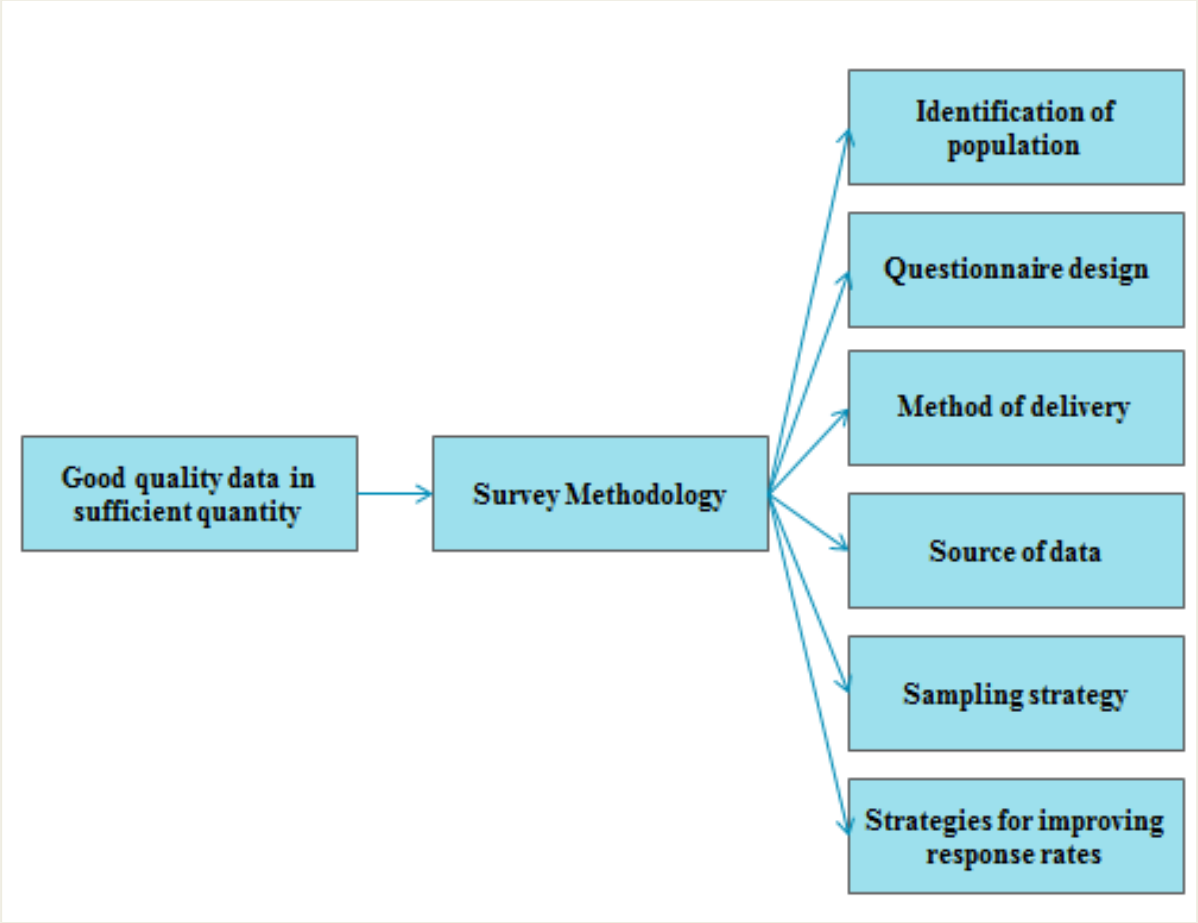

Figure 11- Survey Methodology Framework. ***Source: Melnyk (2012)***

The framework displayed in Figure 11 shows the main dimensions to be considered when elaborating a survey so that the correct respondents are targeted, with a representative sample of the defined population, and the maximum number of responses can be obtained. The next sections will explore these subjects.

4.1.1 Design of the questionnaire

The first step of the survey design is the definition of the respondents, i.e., the identification of the population. The scope of the project is to evaluate SC in Brazilian and Italian scenarios, given the mutual interest raised through the Double Degree program at Politecnico di Milano in which the author has participated and, as analyzed before, the high potential for improvement opportunities in commercial flows between these two countries.

As the partnership patterns existent between Brazilian and Italian players are to be analyzed, it was necessary to define two population segments, so that both Italian companies with Brazilian partners and vice-versa could be taken into account.

Therefore, two databases were used, one with Brazilian exporting companies and the other, with Italian exporting companies, both considering only the apparel industry.

a) **Brazilian companies from the apparel industry that export;**

b) **Italian companies from the apparel industry that export.**

Basically, the process of reaching these databases consisted in the contact with an external organization called *Câmara Ítalo-Brasileira de Comércio, Indústria e Agricultura*, which provided the contacts of Italian exporting companies in the apparel industry. At the same time, it was possible to access an official database by CNI (Confederação Nacional da Indústria) that contains Brazilian exporting companies from the apparel industry.

The total amount of companies in these databases is as follows:

- 123 Brazilian exporting companies from the apparel industry;
- 109 Italian exporting companies from the apparel industry.

It was interesting to include companies that export to other countries besides Italy and Brazil in the survey, given that these responses could be used, at the end of the report, in order for a larger sample to be considered in the calculation of correlation coefficients.

After identifying the target population, the next step is to design the questionnaire. It has already been defined that a combination of the SC 4C's model and the SCOR framework, both presented in the literature review, will be used for the elaboration of the questions to be asked to the respondents.

As has been approached in the literature review, there are several types of SC integration that need to be taken into consideration. These six dimensions, already shown in Table 1, are recalled once again as follows: relationship, measurement, technology, suppliers, internal operations and customer integration.

Another important consideration is related to the scale to be used in the questionnaire. Considering that some of the topics approached by the survey are not objective, such as level of trust and goal congruence, for example, the method to be applied is the Likert scale. According to this approach, the respondent can rank the variable from a minimum reference up to a maximum one. This kind of assessment can be very interesting for an exploratory survey, given that it can quantify abstract variables so that they can be fairly compared afterwards and, besides that, it proves to be an easy tool to use and interpret.

The usage of the Likert scale is explained by Wu (2007), who states that this tool is very popular and effective for measuring attitudes, images and opinions. He explains that the main advantages that arise from the usage of this scale are related to its universality as survey

collection method, the easiness to quantify subjective variables and the possibility for the respondent to answer in "degrees", with no requirement for him to take a radical stand.

On the other hand, he also approaches the disadvantages that result from the Likert application, which can be related to the unidimensional character of the scale that seeks to explain multi-dimensional phenomena. Besides that, it only gives from five to seven choice options, with difficult calibration of the space between the possibilities. It is also not unlikely that the answers will be influenced by previous questions or will bend towards a response side.

Taking these factors into consideration, the scope of the Likert scale that will be utilized needs to be defined. It was already established that the scale will be numeric and, regarding the number of choice possibilities, it is interesting not to include too many divisions so that the respondent does not get confused about the scale level he wants to answer, especially in this case, where the constructs tend to be subjective. Therefore, the questionnaire will be assessed through a Likert scale that ranges from one to five.

The rationale used to elaborate the questionnaire is displayed by the four bullet points below.

a) the first section is focused on the respondent description and will be realized through the usage of questions related to the identification of the company, the hierarchical position of the respondent in the organization and the existence of commercial relations with Brazil or Italy, depending on the home country of the respondent company;
b) the second section of the questionnaire is related to the identification of the integration level in the apparel partnerships. As was already approached in the report, the reference model here is the SC 4C’s;
c) the third part is related to the assessment of the performance in terms of the logistic indicators proposed by the SCOR framework;
d) the last part consists of two optional open-ended questions, which focus on the identification of potential benefits and difficulties that the respondents may face when trying to consolidate the integration process in a cross-enterprise scenario.

In addition to that, as the questionnaire was built, the necessity to differentiate the respondents among themselves was detected. This occurred because the questions could be more clearly put together if, for example, suppliers and clients received slightly different questionnaires, adapted to their position in the partnership. The content of the questions is exactly the same for each of the variations of the questionnaire, with some differences in key words. This

initiative enabled a clearer questionnaire, with more assertive questions. An example of this variation can be seen in the following question:

“The quality level that we offer to our main client is consistent” (question directed to respondents that defined themselves as suppliers) vs. “The quality level that our main supplier offers to us is consistent” (question directed to respondents that defined themselves as clients).

Figure 12 displays a diagram showing the dynamics according to which the questionnaire works is displayed.

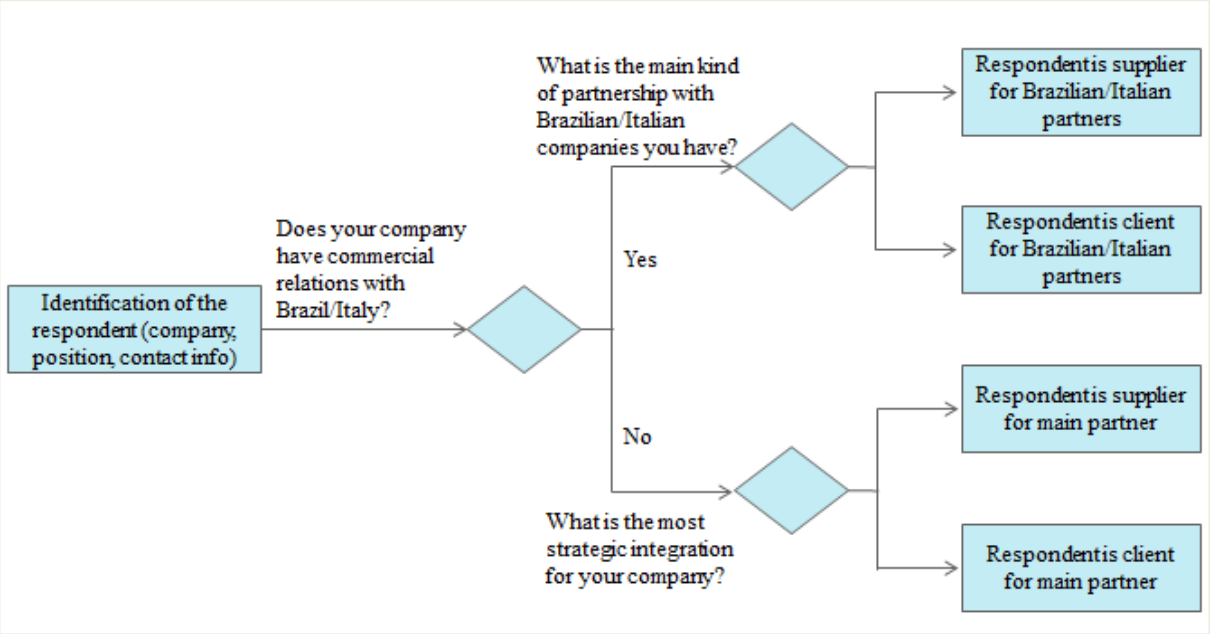

Figure 12- Identification of the type of questionnaire per respondent

Basically, as can be seen in Figure 12, there are four different variations of the same questionnaire according to the loops of identification that take place before the actual assessment of the integration level of the partnership. It is interesting to notice that, besides enabling a clearer survey process, the existence of these different versions provides the project with the possibility of comparing the responses of each kind of respondent to the others, so that the different roles companies play in the SC’s can be analyzed.

The questionnaire was elaborated so that it took approximately ten minutes to be compiled, assuring that the respondents did not give up halfway as a result of its excessive length. Below there is a deeper explanation of each part of the questionnaire.

a) Identification of respondents: this section aims to get to know the respondent. In order to do so, some strategic questions are asked regarding the name of the company, the position of the respondent in the enterprise, contact information of the person

compiling the questionnaire and, finally, the first loop asking if the company has commercial relations with partners in Italy or Brazil, depending on the home country of the respondent. As the diagram above shows, if the answer is “Yes”, then another loop takes place, asking if the main Italian/Brazilian partner is a client or a supplier and also if this relation is actually relevant for the business. Depending on this answer, a different questionnaire is displayed for the respondent to answer.

On the other hand, if the answer is “No”, another identification question appears asking if the most strategic kind of integration for the company is with its main client or customer. Depending on this answer, the respondent assumes a different position in the SC, the client or the supplier. After all these loops, the role in the SC of each respondent is clearly defined and the answers provided can be adequately clustered.

b) Supply Chain Integration: after segmenting the respondents, it is possible to ask the questions regarding the level of integration that they have with their main partners, be they clients or suppliers, in the SC. In order to do so, the basic parameters of the SC 4C’s Model are taken into consideration (trust, goal congruence, information sharing and decision-making process), besides an additional aspect related to the mutual development of both partners when working together. An explanation is provided relating each question to the topics considered by the reference model.

    - Trust

The reference model divides the level of trust in commercial relations in four stages according to the degree of confidentiality and goodwill involved in the partnership. Recalling what has been presented in the section 2.3.1 of this report, a partnership can be classified in these four categories according to the kind and level of trust involved:

- **deterrence-based**: little knowledge and fear of reprisal if the obligations are not respected;
- **reliability trust**: trust developed from the experience over a reasonably long period of time and alignment of expectations;
- **competency trust**: trust on the other party's capacity to meet commitments;
- **goodwill trust**: related to the parties' pro-activeness to open and share key data between each other.

In this survey, there are three questions addressing the trust involved in the partnership and their objective is to measure in which stage the respondent is in terms of integration with its main partner.

The first one is related to the **consistency** of the deliveries that the respondent offers or gets from its main partner. Basically, the objective of this question is to assess the level of competency trust existent in the partnership. Given, for example, that the historical behavior of a supplier is consistent, it is reasonable to consider that the relationship is based on trust that each player will be able to meet commitments.

The second one refers to the **quality standards** existent in the commercial relations between the respondent and the partner. This question will be used to analyze the reliability trust. It is pretty clear that the level of quality being traded between partners is closely linked to the trust that the each player has on the other regarding their capacity to meet aligned expectations.

Finally, the last question approaches how **confidential** the information being shared between partners is and, therefore, is closely linked to the level of goodwill involved in the partnership.

Goal congruence

The second parameter to be considered according to the SC 4C's model is the goal congruence. It proposes three different stages of goal congruence, which follow.

- **absence** of congruence: there is not much concern regarding the SC's welfare. Individual interests may be conflicting and compromise the overall needs of the partnership;
- **moderate** goal congruence: partially compatible interests among the players;
- **true** goal congruence: generally linked to the goodwill kind of trust, the true goal congruence represents the fact that each player believes that the overall SC's interests can be achieved without disregarding their own individual ones.

In order to tackle this element, three questions were elaborated. Basically, the objective of this section of the questionnaire is to assess how aligned the objectives of the partnership are between the respondent and its main partner.

Therefore, following this rationale, the first question refers to how clear the objectives of the partnership are to the respondent. If the partners have a very good alignment of

objectives, it is reasonable to consider that the level of congruence is high and that the relation is well integrated.

The second question tackles the daily activities that are involved in the partnership and how much the company's actions and strategies are consonant with the partner's objectives. Finally, the last question approaches the internal alignment regarding the objectives of the company's partnerships. This is a strategic item of the questionnaire, given that it is essential for the company to be internally coherent regarding its priorities and objectives before determining and assessing external partnerships.

- Information sharing

When it comes to information sharing, the SC 4C's model basically assesses if the process is SC-wide or if it happens between close partners only. Besides that, it also tackles the content of the information being shared in order to figure out if the information is more transaction-related or strategic.

In order to analyze this parameter of the model, the questionnaire has four questions concerning the content of the information shared (info about demand patterns, inventory and production plans) and the information systems that connect the respondent to its partner. The more information being shared and the more advanced the information systems are, the more integrated the relationship and, possibly, the better the partnership performance.

- Decision-making process

This is the last element of the reference model and it refers to the structure of the decision-making process. Basically, it aims to assess how developed the collaboration between two partners is and, besides that, how the bargaining power is distributed in the partnership. In the questionnaire, in order to tackle these elements, four questions were elaborated in order to understand how collaboratively the decisions regarding sales plans, promotions, inventory replenishment and production plans are made. Finally, the last question refers to the collaboration in the intraorganizational decision-making, considering that one of the SC integrations defined by Stank (2001) is the internal operations integration.

- Mutual development

This part of the questionnaire was designed as an extra feature to the reference model in order to understand a little more regarding the partnership collaboration (as proposed by the CPFR model) and the impact the one partner has on the other's

internal processes and activities. Basically, the questions refer to the collaboration in the product development process and the development of internal processes based on the partner's inputs and needs.

c) Operational performance: this section of the questionnaire consists in three groups of questions based on the SCOR framework and the macroprocesses it suggests (plan, source, make, deliver and return). The initial intent was to define questions for each of this processes separately, but this was not applicable once the length of the questionnaire would be too large, what could hinder the number of responses. Therefore, three subgroups were formed, with three questions each in order to assess the respondent's operational performance.

- Delivery

This section evaluates the delivery process of the products bought or supplied by the respondent. If it is the client, the questions refer to the partner's performance, whilst if the respondent has identified itself as the supplier, the assessment refers to its own performance.

The questions approach the delivery time, its variability and the ability of the partnership to meet the deadlines. It is interesting to notice that some aspects of the SCOR macro-process "source" are already considered here, since one of the main drivers in the sourcing process is the evaluation of the potential supplier's lead time and delivery consistency and, when the collaboration level is high, the adoption of supplier development practices to increase the SC efficiency and effectiveness.

- Costs

This section evaluates the respondent's efficiency in terms of production and inventory costs. Basically, it assesses if the partnership results in competitive advantage based on scale effects (purchasing prices) and also on inventory costs. Here it is important to point out that less inventory is related to better planning (through better forecasting, more information sharing and more collaboration, for instance) and, therefore, the "plan" macro-process of the SCOR framework is also present.

The same consideration is also applicable to the last question, which refers to the respondent's efficiency (both in terms of costs and time) to modify and develop products according to the demand.

- Return

This section aims to analyze the devolution patterns in the partnership. This is an important aspect of the SC performance and is an indicator of how the integration can

improve the efficiency and effectiveness of the partnership. Basically, the items tackled in this analysis are the devolution rate, the replenishment time in case of devolution and, finally, the correction and control practices existent in the partnership so that errors and inefficiencies do not get recurrent.

d) Final considerations: after asking the respondent the points mentioned above regarding its integration with the respective partner and its performance, this final section proposes a more open approach, with open-ended questions, in order to understand the main benefits that companies in the apparel industry see in the amelioration of SC integration and also the main difficulties that they face in order to deepen this process.

The next section contains the questionnaire in English. It is important to point out that the ones sent to the companies were in Portuguese for the Brazilian ones and in Italian for the Italian ones.

The following questionnaire assumes that the respondent is a Brazilian company that has an Italian client. As has been highlighted in Figure 12, depending on the answers of the respondent, different formats of the questionnaire, with little variations each, are displayed for him to answer.

4.1.2 Questionnaire

This questionnaire aims to identify the integration level in the apparel industry and determine the difficulties that companies face to deepen this integration process with their partners.

The study is part of a graduation project for Escola Politécnica da USP, in Brazil, and for Politecnico di Milano, in Italy.

We believe that this survey is also an opportunity for the companies to reflect about the challenges and possibilities to ameliorate Supply Chain integration in the apparel industry.

The questionnaire is composed basically by multiple-choice questions and should not take more than 10 minutes to be compiled.

If you have any doubt or consideration regarding the project, contact raphael.alegre@usp.br.

Thank you very much for your collaboration and we await your response!

Raphael Alegre.

Identification of the respondent

- What is your name? _____
- Please, provide an e-mail _____
- What is your company's name? _____
- What Is your position in the company? _____

- Does your company have Italian commercial partners? ( ) Yes ( ) No

Identification of the partnership

- Please specify the main type of partnership with Italian companies that your organization has:

( ) Italian partners are our CLIENTS
( ) Italian partners are our SUPPLIERS
( ) Italian partners are our SERVICE PROVIDERS

- Is the commercial relation with this partner relevant for your company?

( ) It is not relevant
( ) It is slightly relevant
( ) It is relevant
( ) It is very relevant

Supply Chain Integration

Trust

- The quality pattern that we deliver to our main Italian client is consistent
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- The quality pattern that we deliver to our main Italian client is high
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree
- The information shared with our main Italian client is confidential
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Goal congruence

- The objectives of the partnership with our main Italian client are clear
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- These objectives determine the daily operational activities
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- Inside the company, the objectives of our partnerships are clear
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Information sharing

- We share information about DEMAND with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We share information about INVENTORY with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We share information about PRODUCTION PLANS with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- Our information systems enable integration with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Decision-making process (Decision sharing)

- The decisions about sales plans and promotions are made together with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- The decisions about inventory replenishment are made together with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- The decisions about production plans are made together with our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- Internally, there is decision sharing among the areas in the Supply Chain management
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Mutual development

- We share information with our main Italian client in the product development process
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We help our main Italian client develop its internal processes
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- Our main Italian client helps us develop our internal processes
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Operational Performance

Delivery

- The delivery time to our main Italian client is adequate
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- The variability of the delivery time to our main Italian client is low
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We get to meet the deadlines we promise to our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Production and Inventory Costs

- We offer competitive advantage in terms of costs to our main Italian client

Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We offer inventory management competitive advantage to our main Italian client
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- We are efficient when developing or modifying products
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Return

- The devolution rate of our products by our main Italian client is low
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- When there is devolution, the replenishment time to our main Italian client is low
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

- The devolution cases generate analysis of the causes and corrective actions for the definitive solution of the problems
  Totally disagree – 1 ( ) ( ) ( ) ( ) ( ) 5 – Totally agree

Final considerations

- In a nutshell, how integrated are we with our main Italian client?

  ( ) We are not integrated
  ( ) We are slightly integrated
  ( ) We are integrated
  ( ) We are very integrated

- What are the main expected benefits of deepening the integration with our main Italian client?
  _____

- What are the main difficulties to deepen the integration with our main Italian client?
  _____

- Please, feel free to make any criticism or suggestions regarding the questionnaire.
  _____

4.1.3 Validation of the questionnaire

According to Hoss (2010), the validation of a measuring tool reflects the degree to which the elements present in the questionnaire are representative and relevant to the concept being investigated. Therefore, when building it, the key concepts need to be input in the questions so that the identification and measurement of each one can be properly conducted afterwards.

Before having the responses of the survey, a validation of the research tool was conducted in order to verify the credibility of the questionnaire. The steps displayed in Figure 13 were taken into consideration in this phase of the validation process.

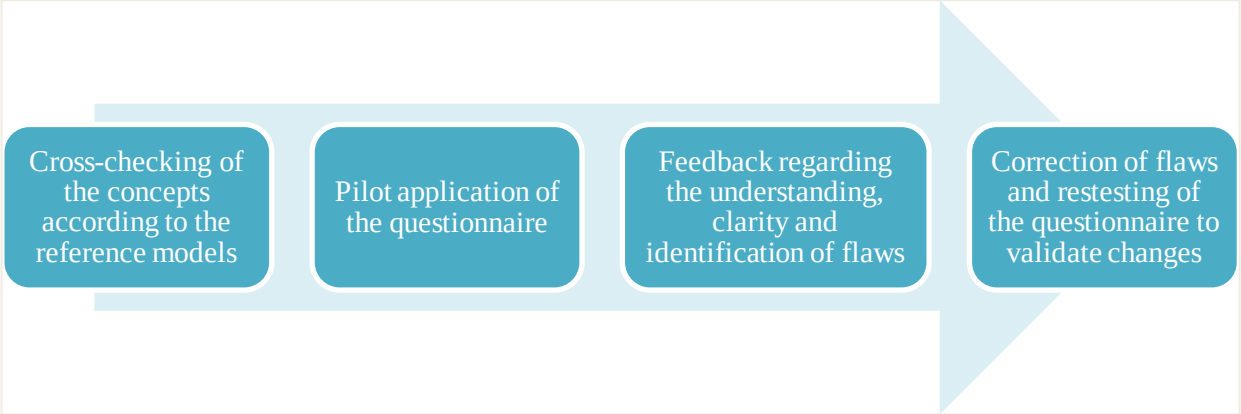

Figure 13- Steps for the validation of the questionnaire

A brief explanation of each of steps highlighted in Figure 13 is provided below.

a) Cross-checking of concepts: the first step to validate the questionnaire was to make sure that all of the concepts used in the questions were coherent with the dimensions proposed by the reference models. The strategy used for the elaboration of this tool was to group the questions according to the reference dimensions (proposed by the SC 4C's model and the SCOR framework) so that it would be easier to analyze the variables in a cross-dimension scenario and, besides that, it was an effective means to ensure that no important dimension would be left out of the analysis.

   The semantics and the formulation of the sentences were very carefully considered in this step of the validation process so that all of the vocabulary and points present in the questionnaire were coherent to the constructs defined in Table 2, ensuring that no divergence between the respondent's understanding and the construct being used in the project existed.

b) Pilot application: this phase consisted of some pilot applications of the questionnaire with people that were not involved in its elaboration as a means to identify potential flaws and try to clarify some points that could hinder the overall performance of the questionnaire as a survey tool.

   A total of three people were surveyed with the pilot version of the questionnaire and the main outcomes of this stage of the validation process are the pain points that the respondents of this pilot version encountered when trying to fill the questionnaire,

mainly related to vocabulary and semantics that could be improved for the final version.

This phase was repeated as changes in the questionnaire, both in terms of scope and format, were made. At the end of each phase, the respondents' suggestions were incorporated to the questionnaire and once again tested to verify the validity of the tool.

4.1.4 Method of Delivery and Strategies for Improving Response Rates

The method of delivery chosen for this questionnaire is electronic. Considering the databases used to define the respondents, the e-mail of key employees of each target company was identified. With this information available, it was possible to track the level of response and to resend the questionnaire to those companies who had not answered in the first two weeks after the first e-mail.

Along with the questionnaire, a brief explanation of the project and the responsible universities were displayed so that the respondent could relate the survey to credible institutions and the response rate could be higher.

Basically, the steps performed during the delivery of the questionnaire are listed below.

a) First contact with the target companies: a first e-mail was sent explaining the intent of the project and the potential benefits that the company could have by answering the questions. This text can be found in section 4.1.2, along with the questionnaire.
b) Resending the questionnaire: only to those companies who had not submitted any response in up to two weeks after the step above. This phase consisted of insisting that these companies responded the questionnaire, emphasizing the potential benefits that could arise from the results of the project.
c) Contact by telephone: in order to increase the response rate, the last phase was to contact the companies who had not answered by telephone so that some of them could send the answers later on electronically or even answer the questionnaire orally on the phone.

After all the procedures explained above, the following outcomes resulted out of the application of the questionnaire in the two databases.

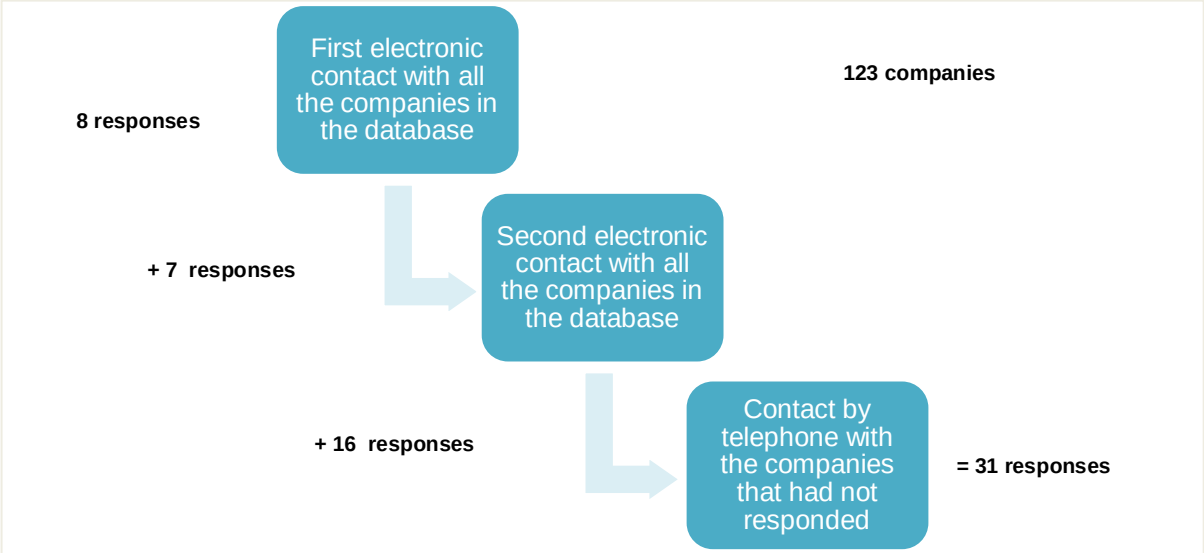

Figure 14- Response rate for the Brazilian companies

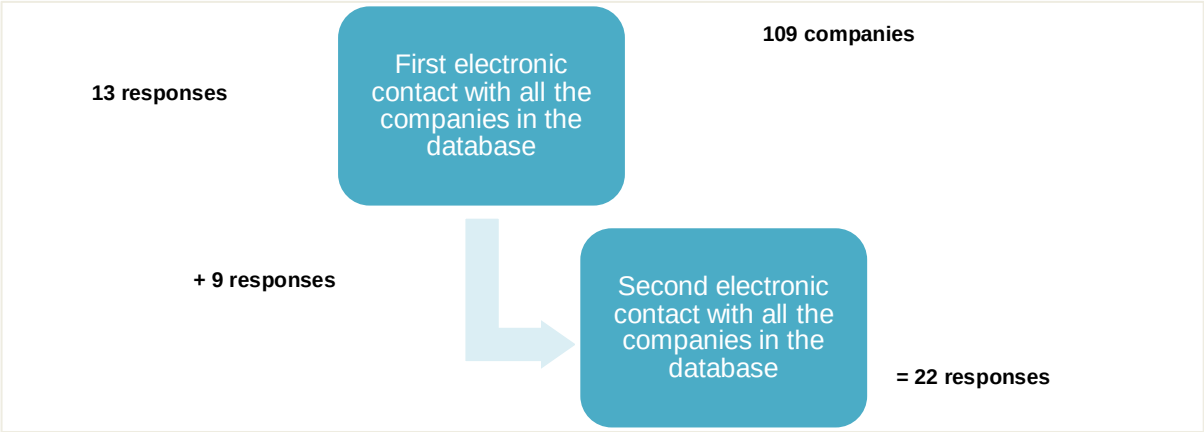

Figure 15- Response rate for the Italian companies

As can be seen in Figure 14 and in Figure 15, there were 31 Brazilian and 22 Italian responses to the questionnaire. Considering that the Brazilian database contained 123 companies and the Italian one, 109, we were able to get response rates of 25,2% for Brazil and 20,2% for Italy, which are coherent with the benchmark conducted with other survey results, which is presented below.

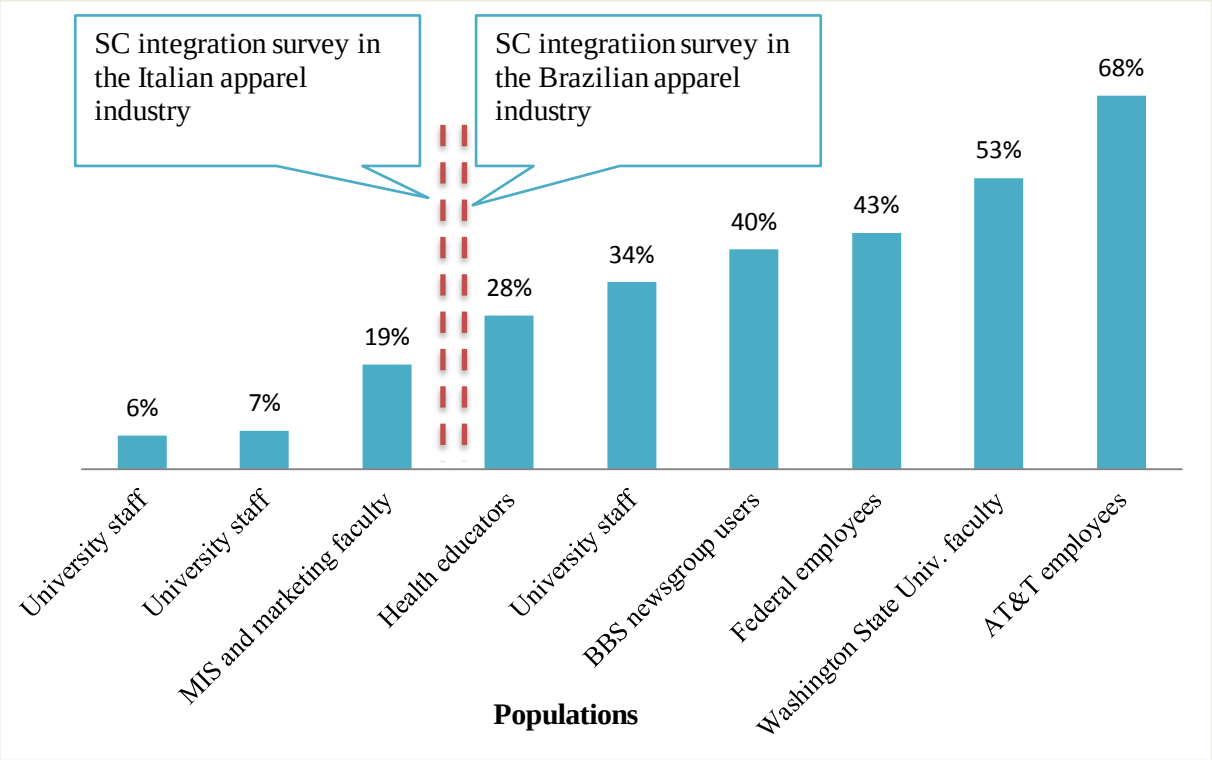

Figure 16- Benchmark of response rates for electronic surveys. ***Source: Schonlau (2002)***

It is possible to notice, observing Figure 16, that the more internal the survey is to a given organization, the higher the response rate tends to be. For example, the three studies with the highest response rates are the ones whose population is internal to the enterprise (AT&T, Washington State Univ. faculty and federal employees) and, therefore, may have more benefits to participate in the survey. On the other hand, when the population is external to the organization promoting the survey (e.g. customers, partners etc), the response rates tend to be lower.

The next sections are dedicated to the analysis of the responses and to their segmentation according to the role each respondent plays in the SC.

5 Discussion of results

This section is dedicated to the discussion of the survey responses for Italian and Brazilian companies and, afterwards, to conduct a comparison between them and relate the integration results to the performance indicators.

5.1 Presentation of general results

The total number of responses was 31 for Brazilian companies and 22 for Italian ones, with a total of 53 participants. Out of these organizations, about half has commercial relations with the other correspondent country (Brazil or Italy, depending on the origin of the company). The distribution can be seen in Figure 17, where "Yes" means that the respondent declared that it is engaged in commercial relations with Italian/Brazilian partners and "No" means that it does not maintain any kind of partnership with companies from the complementary country.

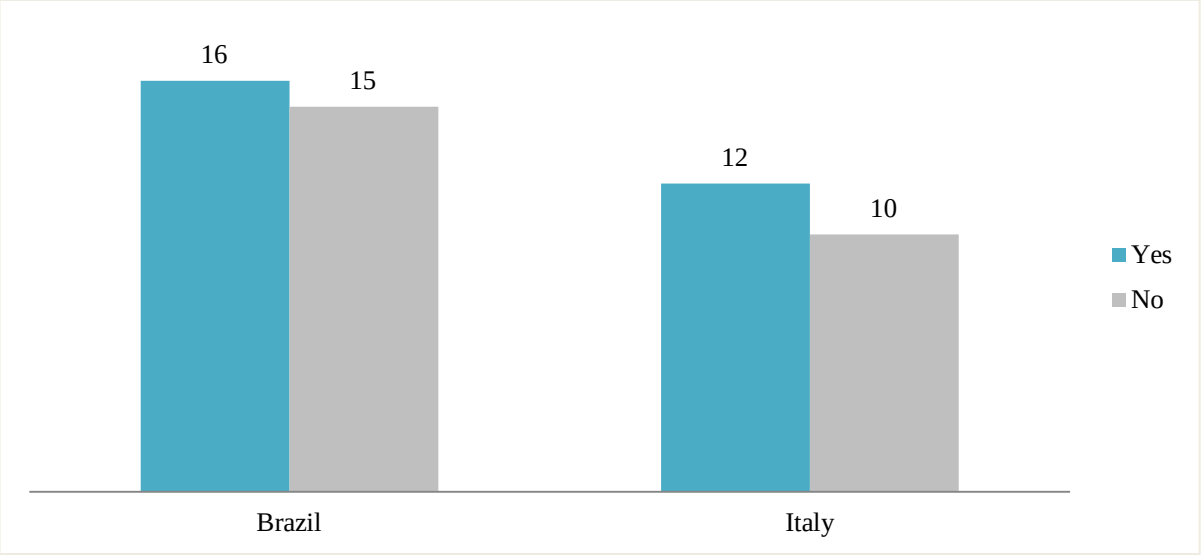

Figure 17- Distribution of commercial relations with Brazil/Italy

The proportion shown in the graph above is not completely random. As the contact with the potential respondents went on, it was possible to resend the questionnaire and call those companies that were more strategic to the scope of the project. Therefore, the intent was to increase the number of companies that indeed have commercial relations with the complementary country. The result, thus, is that about 53% of the respondents declared to be engaged in commercial relations with Italy/Brazil, while the other 47% are not.

Besides that, out of the 16 Brazilian respondents that have commercial relations with Italian partners, nine declared that this partner is a client, whilst the other seven interact with Italian

suppliers. On the Italian side, out of the 12 responses, 50% have Brazilian clients and 50% have Brazilian suppliers.

Regarding the respondents who do not have commercial relations with companies from the complementary country, Brazil had a total of 15 companies, out of which 11 consider more strategic integrating with the main customer and the other four, with the main supplier. For the Italian respondents, out of the 10 companies that declared that do not maintain commercial relations with Brazilian partners, six considered more important to align with the main client, while the other four, with the main supplier. These numbers can be seen in **Error! Reference source not found.**Figure 18. In a nutshell, the blue segments represent respondents who identified themselves as suppliers, while the gray one, as clients.

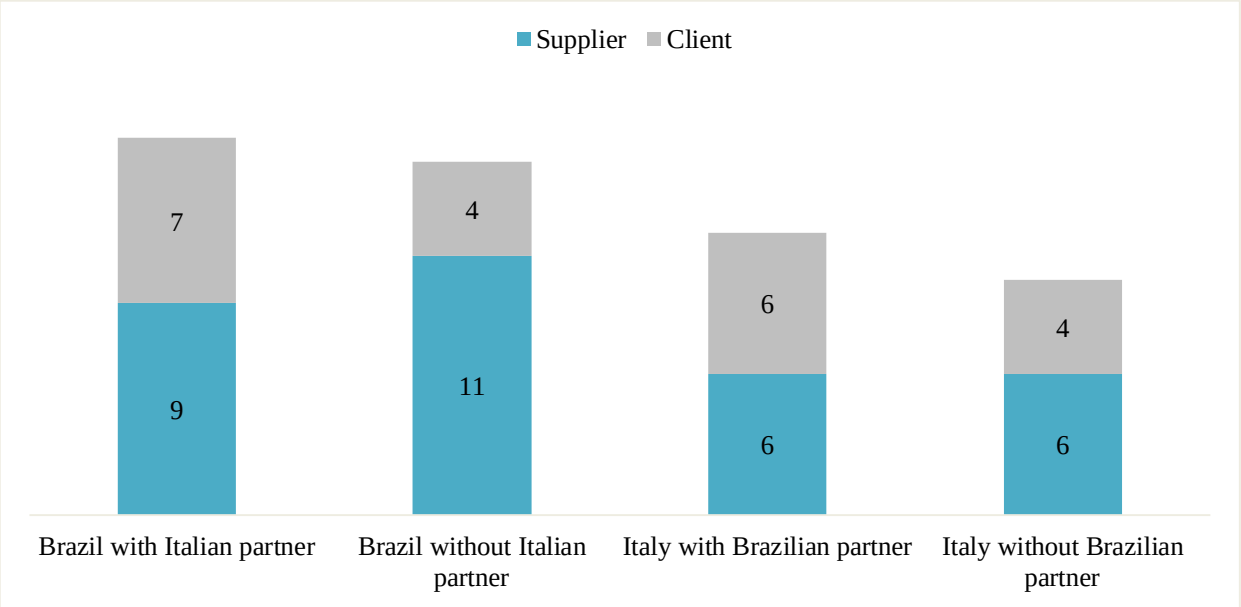

Figure 18- Integration profile in terms of kinds of partnership

The first part of the analysis will be to consider the results separately for Brazilian and Italian companies so that a comparison of the level of integration in the apparel value chain (between garment manufacturers and its suppliers) between these two groups can be made.

5.1.1 Analysis for Brazilian respondents with Italian partners

As has been presented before, there are 31 Brazilian respondents, 16 of which pursue commercial relations with Italian partners. The first step will be to analyze the relevance of these partnerships for the respondents. In order to do so, there is an item in the questionnaire that tackles how relevant the partner is for the respondent's business. The results for this question are displayed in Figure 19.

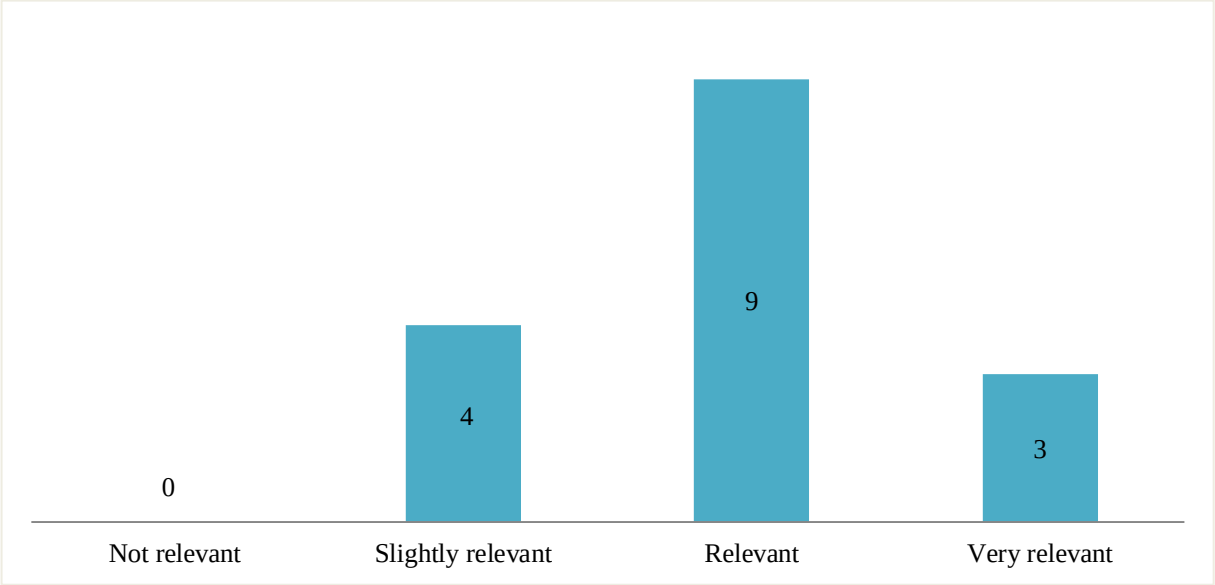

Figure 19- Relevance of the partnership with Italy for Brazilian respondents

Considering a linear weight distribution for each relevance status, it is possible to calculate the average relevance of the partnerships with Italian companies for Brazilian respondents.

Relevance	Weight
Not relevant	0
Slightly relevant	1
Relevant	2
Very relevant	3

Table 6- Weight for each partnership relevance level

This average is 1.94, which corresponds to a considerable level of relevance. Therefore, it is possible to state that, on average, the partnerships with Italian companies are **relevant** for Brazilian respondents when it comes to their business strategy.

Knowing, thus, that the partnerships are important, the next step is to analyze the integration level. In order to do that, the questions regarding the SC 4C's model will be taken into account. These analyses follow.

5.1.1.1 Trust

The first aspect to be considered is the level of trust in the partnership. In order to do so, three variables will be analyzed: consistency of deliveries, quality of deliveries and confidentiality of information exchanged in the partnership.

The basic descriptive statistics for the three questions can be seen in Table 7.

	Player	Mean	Std. Deviation	Variation Coeff.
Consistency of deliveries	Supplier	3.33	0.71	21.2%
	Client	3.71	0.76	20.4%
	Total	**3.5**	**0.73**	**20.9%**
Quality pattern of deliveries	Supplier	4.00	0.87	21.7%
	Client	4.00	0.58	14.4%
	Total	**4.00**	**0.73**	**18.3%**
Confidentiality of information sharing	Supplier	3.33	1.22	36.7%
	Client	3.43	0.98	28.5%
	Total	**3.38**	**1.09**	**32.2%**

Table 7- Descriptive statistics for Brazilian companies with Italian partners for "Trust"

Analyzing strictly the statistics displayed on Table 7, it is possible to notice that the respondents consider the levels of quality being delivered to/from the main Italian partner higher than the levels of consistency or confidentiality of information. The standard deviations for "Quality" are also relatively low, considering the ones for the other two variables.

Another interesting conclusion that can be made based on the table is the significant difference between suppliers' and clients' answers. For all three questions, "clients" had higher or equal means, with an average surplus of 4.5%, and lower standard deviations, on average 17.5% lower than the supplier's ones, what may indicate a better level of trust in partnerships with Italian suppliers rather than with Italian clients.

Using the SC 4C's model, the numbers show that there is potential for deterrence-based trust in these partnerships, considering that their average relevance for Brazilian respondents is 1.94 out of 3. The importance of these commercial relations for Brazilian players can represent an asymmetric distribution of the bargaining power in the partnership and condition the weaker company to accept the partner's conditions based on the fear of reprisal in case of not meeting expectations and interests.

At the same time, it is possible to assume that this level of shallow collaboration in the SC has already been surpassed by most of the respondents and their partners, since the parameters of competency, reliability and even goodwill trust in the relations are already prominent, as can be noticed in the table. In fact, the overall profile of the responses shows that the Brazilian-Italian partnerships are evolving in terms of trust.

This evolution can be faced as a natural process that takes place as partners begin to trust each other more. First, the motivation for the partnership is not fear anymore, even if the relations are important and strategic for them, which is the case here. Instead of fear, the driver for companies to engage in these partnerships is, more and more, related to the results that the

partner has in terms of quality standards and expectation-meeting. After achieving a desired level of quality, it is necessary for these patterns to be consistent in time, so that partners can count on the other in order to reduce scrap rates and improve the service level to final customers.

The last stage of trust integration occurs when there is already a high level of reliance and the supplier is familiar with the client's requirements and production process. This increases the transition costs of changing suppliers and, therefore, brings a new partnership motivation to the table, which corresponds to higher levels of **synergies** between players. This phase involves much more confidentiality in information sharing and collaboration across the SC and, therefore, is characterized as goodwill trust by the SC 4C's reference model.

This evolution process can be seen very clearly in the responses obtained with this survey, with increasing averages and decreasing coefficient variations for, respectively, quality, consistency patterns and confidentiality of information. This analysis can be visualized in Figure 20.

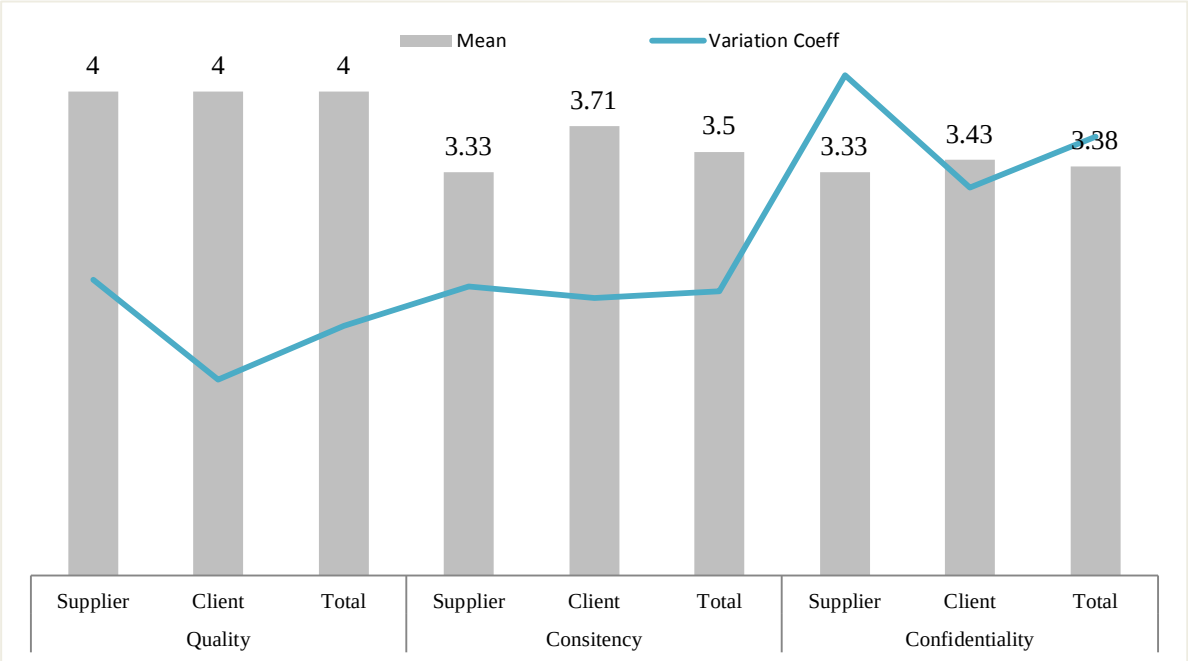

Figure 20- Trust evolution in the Brazil-Italy SC for Brazilian respondents

Trust in Brazilian-Italian partnerships is in a positive scenario. Based on Figure 20, it is possible to understand that, both for clients and suppliers, the expectations regarding quality standards are being met and, as a consequence, the trust, for the partnerships analyzed here, is more inclined toward the next step in the evolution chain, which is **competency trust**, since partners, on average, seem to trust on the other's capacity to honor his commitments.

There are also concrete possibilities of improving goodwill trust among partners, as can be verified by the non-optimal averages for “Confidentiality” and, at the same time, high variation coefficients, which show that the maturity of this level of trust has not yet been achieved.

In a nutshell, Brazilian respondents with Italian partners, on average, have a consolidated level of competency trust, based on adequate quality and reliability levels. This tends to evolve to more deep integration as synergies are built among partners. As, for example, weaker players become OEMs, the level of integration tends to increase and so the confidentiality of information involved in the partnership. Figure 21 shows the correlation coefficients for the variables considered in this dimension of the analysis.

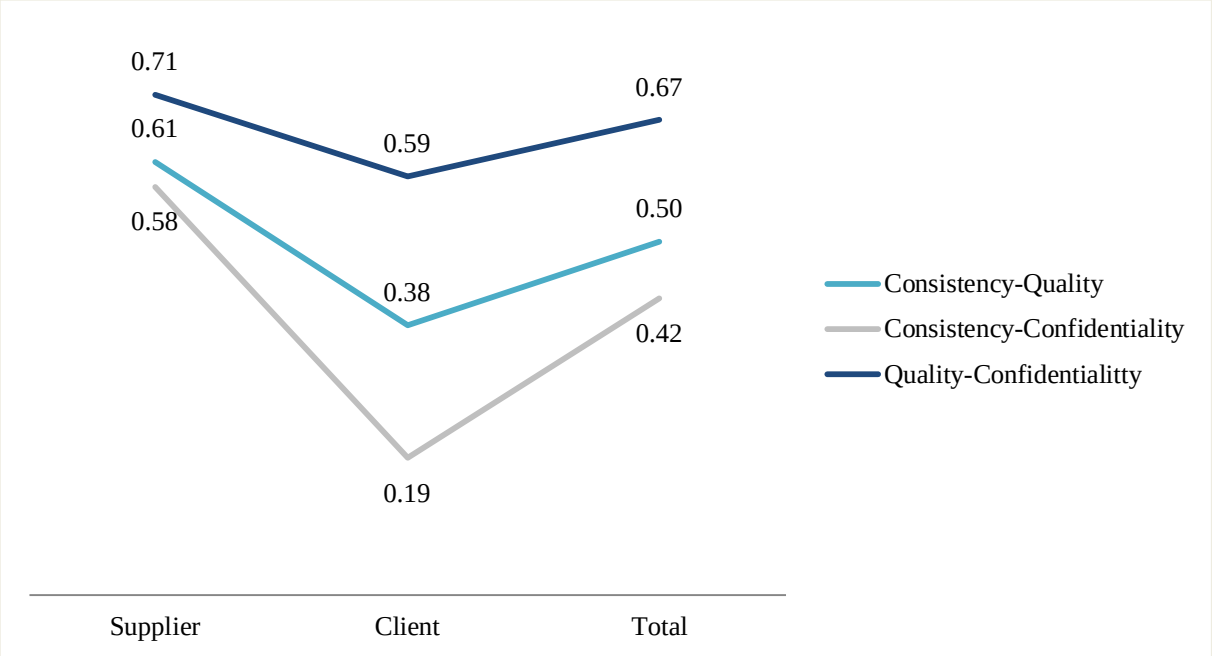

Figure 21- Correlation coefficients for "Trust" - Brazil with Italian partners

First of all, in order to standardize the assessment, the following reference thresholds will be considered, as proposed by Santos (2007).

Correlation coefficient	Description
+1.00	Perfect positive correlation
+0.7 to +0.99	Very strong positive correlation
+0.5 to +0.69	Substantial positive correlation
+0.3 to +0.49	Moderate positive correlation
+0.1 to +0.29	Low positive correlation
+0.01 to +0.09	Insignificant positive correlation
0.00	No correlation

Table 8- Correlation thresholds. ***Source: Santos (2007)***

Analyzing Figure 21, some considerations can be made regarding the behavior of these three parameters. Basically, the highest correlations coefficients in the graph are related to Brazilian suppliers. Therefore, according to the suppliers, respondents of this survey, the higher the quality of the deliveries, the higher their consistency and the confidentiality of information. This is coherent with the analysis made previously regarding the evolution of the trust dimension in the Brazilian-Italian SC from the Brazilian players' point of view.

According to what had been explained before, high levels of quality leads to the increase of deliveries' consistency, which, ultimately, provokes the enhancement of synergies and, therefore, the confidentiality of information in the partnership. This relation is also tackled by the correlation coefficients calculated here, which show that, for Brazilian suppliers, investing in SC integration is potentially worthwhile, since it can leverage its strategic partnerships and even enhance its position in the apparel value chain as a whole. It is important to highlight that correlation does not necessarily mean the existence of cause x effect relations and, therefore, it is not possible to state that these values prove the evolution framework proposed before and based on the literary review, but it is fair to say that the correlation coefficients are coherent with it.

On the other hand, Brazilian clients present lower levels of correlation, what may mean that they do not consider such a strategic move to enhance trust in their relations with Italian suppliers. In order to assess this situation a little bit deeper, a segmentation of the relevance average of 1.94 calculated previously will be made here, so that it is possible to understand if these partnerships are less strategic for Brazilian clients than for the suppliers. Calculating a new relevance indicator only for Brazilian clients, it is possible to see that, indeed, the relevance of the partnerships is lower for clients (1.83 against 2.0 for Brazilian suppliers). This could be a potential explanation for the lack of evidence of higher correlation among the variables in this group of respondents.

Regarding the combination of variables, it is visible that quality has a strong correlation with confidentiality of information. This makes sense, considering that partners will not share key information unless they see some advantages in this, i.e., unless the partnership is strategic for their business. A relation based on low-quality deliveries does not result in a win-win scenario and, therefore, does not push players to engage in closer relationships, sharing more information with each other.

At the same time, quality has a substantial/moderate correlation with consistency of the deliveries. It is also coherent with the SC 4C's model, considering that reliability and

competency-forms of trust, according to its approach, are subsequent stages of trust. First, the partnership is based on quality (trust that the partner has the ability to meet expectations based on previous experience – possibility for one partner to rely on the other, knowing the quality pattern of the partner's deliveries) and, after that, on consistency of deliveries (trust that the partner will be able to honor his commitments through the consistency of deliveries). It is obvious that these two types of trust are completely related to each other and the evolution is more of a theoretical model than a chronological requirement; actually, in the real world, they can happen simultaneously and depend on each other to prosper.

Finally, the last combination of variables to be considered is the one between consistency of deliveries and confidentiality of information. This is the one with the lowest coefficients, with low/moderate correlation, depending on the segment. The correlation is positive, as expected according to the reference model; however, the intensity is not as pronounced as the one with quality. It also makes sense, given that disclosure of information is a key activity to any company and involves risk, as already commented on this report. Therefore, the mere fact of delivering consistently is not enough for close partnerships to develop. This depends primarily on the alignment of objectives between partners and on the quality promised x delivered as well (the partner may be consistent without delivering the expected quality, for example).

5.1.1.2 Goal congruence

The second aspect included in this analysis is the goal congruence between players of the partnership. There are three questions in the survey that approach this theme, which verse about: clarity regarding the partnership's objectives, reflection of the objectives on the respondent's business daily activities (routine) and internal alignment in terms of partnerships' objectives.

The analysis to be conducted here is similar to the one presented in the "Trust" section and, therefore, the following table shows some descriptive statistics regarding the "Goal congruence" part of the questionnaire, always considering only Brazilian respondents with Italian partners.

	Player	Mean	Std. Deviation	Variation Coeff.
Clarity of the partnership objectives	Supplier	3.11	0.78	25.1%
	Client	3.29	1.11	33.9%
	Total	**3.19**	**0.91**	**28.6%**
Reflection of objectives on daily activities (routine)	Supplier	3.11	1.17	37.5%
	Client	2.71	1.11	41.0%
	Total	**2.94**	**1.12**	**38.3%**
Internal alignment of company's objectives	Supplier	3.67	1.00	27.3%
	Client	3.43	0.98	28.5%
	Total	**3.56**	**0.96**	**27.1%**

Table 9- Descriptive statistics for "Goal congruence" - Brazil with Italian partners

The first consideration that can be made based on Table 9 is that internal alignment has the highest average and lowest variation coefficient, what means it is the most diffused practice among respondents. In fact, it makes sense for internal alignment to act as a requisite for deeper levels of integration in the partnership. First, the company needs to converge internally that it is strategic to maintain commercial relations with clear objectives and expectations and only then decide which partnerships to engage in, how to maintain them and which objectives to pursue.

This element was approached in Table 1, as "Internal Supply Chain integration". Basically, the several departments in the company need to share information, collaborate and align their different interests so that strategic partnerships with external players can be pursued and the service level of the whole SC can be improved. The distribution of the responses for "internal alignment" is strongly comprised between 3 and 5, what indicates that the respondents do engage in internal discussion regarding what kinds of partnerships are strategic for their businesses and which the objectives of these commercial relations should be for their companies.

The next variable is the clarity regarding the partnership objectives, with specific reference to the main Italian partner approached by the questionnaire. It has an average of 3.19 with a variation coefficient of 28.6%. The less developed results for this variable in comparison with internal alignment are coherent with the premise that, in order for a specific partnership to be successful and have clear objectives, there must be an internal policy in the organization that incentives the existence of win-win commercial relations, inclined toward high levels of goal congruence. For this variable, the responses profile is strongly comprised between 2 and 4, what indicates that respondents worry about goal congruence in their partnerships with Italian players, but still have field to improve their practices when it comes to aligning objectives with external partners.

The last variable is related to how the objectives of the partnership affect the respondent's routine. It is possible to notice that the average grade is considerably lower than the other two (2.94), while the variation coefficient is higher (achieving 41% for clients, for example). Therefore, the practice of reverting the objectives of the partnership into actual strategies is not diffused among the Brazilian respondents that maintain commercial relations with Italian partners.

In order to better visualize these relations among variables, Figure 22 is displayed, showing the evolution of the means and variation coefficients for the three of them present in the "Goal congruence" section of the questionnaire.

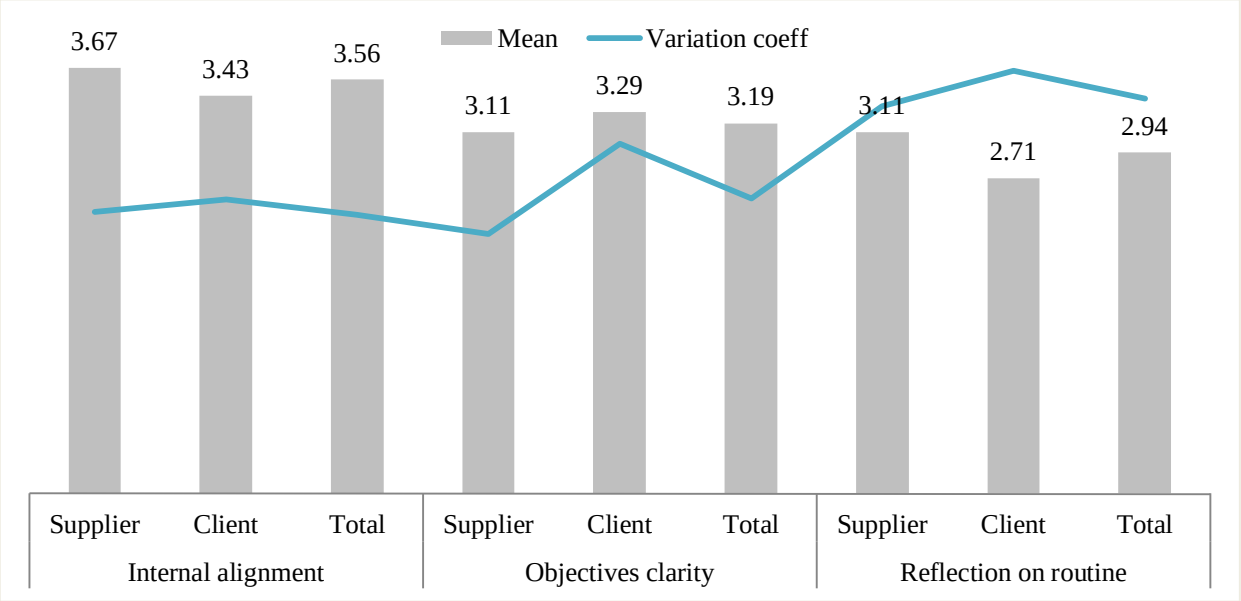

Figure 22- Goal congruence evolution for Brazilian respondents with Italian partners

Basically, it is possible to see that the most diffused practice among respondents considered in this analysis is the internal alignment regarding the strategic issues for their businesses. Through the convergence of interests from different departments such as Marketing, Production and so on, which can, many times, be very contrasting one from another, the most strategic paths for the companies are defined and guidelines for external partnerships built.

When it comes to the clarity of the objectives for the relation with the main Italian partner, the means are still quite high, but at the same time, for Brazilian clients, the variation coefficient is significantly higher than the other ones. Analyzing the distribution for this specific segment, it is possible to notice that the answers vary from 2 to 5, with high concentration in the central marks. It means that the level of goal congruence between Brazilian clients and their Italian suppliers is still evolving and can be classified as **moderate**, according to the SC 4C's model. This category can also be applied for Brazilian suppliers, having in mind,

however, that, according to the responses, they seem to be more aligned than clients with their Italian partners.

However, having congruent goals does not mean that, in fact, the implementation of these strategies take place on the quotidian activities of the company. In order to measure this, a third question was added in this section of the questionnaire, and the statistics are provided in the third cluster of Figure 22.

It is possible to notice that the means are lower and the variations, larger. This is coherent with the reference model, which affirms that the mere goal alignment does not necessarily mean good results for the partnership. There are other conditional factors to be taken into account, such as information sharing between the parties and fair decision-making process to consider both partners' interests, which are very much related to the correct implementation of the objectives agreed when the partnership was formed.

The segment with the lowest mean and largest variation coefficient is the "Brazilian clients", even if it is also the one with more clarity regarding the partnership's objectives. It may seem strange at first, but when the open-ended question of the survey related to the main difficulties to improve integration with the main Italian partner is taken into account, it is possible to figure out that one of the main issues that has emerged is the lack of openness in terms of availability of information and goodwill from Italian suppliers.

This helps to explain why, even when goals are commonly defined for the partnership, sometimes the implementation of these strategies is not so straightforward. This brings back to the table the analysis conducted for the level of trust in the Brazilian-Italian SC. As has been presented, the largest part of the responses regarding confidentiality of information (directly linked with the level of goodwill of the partnership) is concentrated in the grades 2 and 3, which corresponds to a relatively low level of openness.

Basically, therefore, the low level of goodwill and trust from Italian suppliers potentially hinders the adequate implementation of the goals determined in the formation of the partnership. This is a big deal-breaker for the efficiency of the whole SC in which these players are inserted, considering that it is very likely that a bottleneck appear in the interface between Brazilian clients and Italian suppliers, jeopardizing the ultimate service level being offered to final customers in Brazil and the cost advantages that a win-win partnership could bring. In an industry as competitive and fragmented as the apparel one, the undermining of potential win-win partnerships can block the ascension of the weaker player in the value chain and, at the same time, incur an opportunity cost for the stronger player, who will not profit as

much as it could due to decrease of sales (lower quality perception, increase of scrap rates, stock-out occasions, less possibility of scale economies and so on) and, consequently, of revenues.

5.1.1.3 Information sharing

For "Information sharing", the questionnaire considered four questions: information sharing about demand, inventory, production plans and the information systems integration. The intention is to understand how the different kinds of information shared in the SC are distributed among respondents, always trying to relate them with the previous analyses.

As was presented in the literature analysis, information sharing is essential for higher levels of SC integration, since it is one of the main inputs of collaboration between partners and for the development of trust in the partnership. At the same time, this is an activity that brings risk along with its implementation. Therefore, in order to analyze the different types of information, the level of riskiness for the respondent needs to be taken into consideration. Information that has much to do with internal aspects such as production planning tends to be shared more carefully than other kinds of information, related with exogenous factors, such as demand trends.

For this dimension, responses were quite variable, what may indicate that the level of information sharing throughout the respondents is not even. This makes sense considering that information sharing is a bilateral process, depending both on the respondent and on its Italian partner. Therefore, depending on the characteristics of both the Brazilian and the Italian players, different kinds and quantity of information may be shared in the SC.

Some descriptive statistics regarding the four questions tackled by this section of the questionnaire can be found in Table 10.

	Player	Mean	Std. Deviation	Variation Coeff.
Demand information sharing	Supplier	2.89	0.60	21%
	Client	2.86	1.07	37%
	Total	**2.88**	**0.81**	**28%**
Inventory information sharing	Supplier	3.22	1.09	34%
	Client	3.00	1.15	38%
	Total	**3.13**	**1.09**	**35%**
Production plans info sharing	Supplier	3.00	1.32	44%
	Client	2.57	1.27	49%
	Total	**2.81**	**1.28**	**45%**
Information systems integration	Supplier	3.22	1.09	34%
	Client	3.43	1.51	44%
	Total	**3.31**	**1.25**	**38%**

Table 10- Descriptive statistics for "Information sharing" - Brazil with Italian partners

Analyzing Table 10, some conclusions can be made. First, the three kinds of information considered in the questionnaire are not equally shared in the respondents' partnerships. However, all of them are conditioned to how adequate the information systems are to enable this sharing of key information between partners.

The more apt and integrated the information systems, the more likely it is for companies to engage in real-time information sharing and to collaborate with each other. In fact, the means displayed above show that information systems are, on average, well prepared to handle SC integration initiatives. The variation coefficients for "information systems" are reasonably high; the total corresponds to 38% of the mean. It shows that, even though the average state of the information systems among respondents is acceptable, there is still field to improve this parameter.

When it comes to the segmentation between suppliers and clients, the differences are not that significant, what means that both groups are already developing integrated information systems but, at the same time, can improve their performance in this area.

The next analysis is related to the diffusion of each kind of information considered in the questionnaire. Basically, the most advanced element is information about inventory. This is a good start for both parties of the partnerships:

a) Suppliers: sharing inventory data with strategic clients provides fast and efficient feedback for the company to focus on those products that will be demanded by the customers in the future. Besides that, it provides clients with a good outlook regarding the supplier's production capacity. Especially when combined with demand information, this kind of flow between partners can be extremely valuable for the SC's efficiency. The concern with inventory information transmission is essential for cost-cutting measures in the lowest-key segments of the apparel industry. In order for the price to be accessible for the targeted market segments, costs related to operations, distribution and stocks need to be low. Therefore, there is no room for inventory duplication or too much safety stock. The idea is to reduce as much as possible the levels of cycle and safety stocks so that less money needs to be invested in inventory-carrying cost, picking, handling and other kinds of internal costs.

   In a nutshell, the responses showing that inventory information sharing is a relatively common practice in these partnerships demonstrate that, in combination with a decent level of information system integration, SC's have the potential to be efficient, especially the ones with Brazilian suppliers and Italian clients.

b) Clients: here, on the other hand, it is also important to share inventory information. Instead of providing an overview regarding the company's production capacity, as in the suppliers' case, the sharing by clients is essential for the definition of replenishment policies and inventory planning. Depending on the service level required by final customers, different replenishment strategies can be pursued, as well as diverse levels of safety stock.

   Basically, one example that can be quoted here is the reorder point method (ROP), which consists of a constant review of the inventory levels. When a pre-determined threshold is reached, the replenishment order occurs, considering a fixed safety stock level, defined taking into account the supplier's lead time and the demand uncertainty, which can change the rate of inventory consumption or the time for the replenishment.

Higher levels of inventory information in the partnership provide more accuracy to define the supplier's lead time and, therefore, can be useful both for the reduction of safety stock and and for the better definition of the reorder point. Therefore, the reasonably satisfactory level of inventory information exchange in the respondents' partnerships is a sign of evolution towards more integrated and mature SC's.

Aligned with the analysis conducted in the "Trust" section, it is possible to realize that the current stage of competency trust in these SC's, which is based on the partner's ability to be consistent once it has already reached a given quality standard, is closely linked to inventory information exchange. In order for players to have consistent deliveries, inventory data is crucial. Knowing that one of the main aspects of consistency lays on meeting deadlines, lead times are important drivers for the level of trust in partnerships. Therefore, the higher the level of inventory information sharing, the more accurate the upstream processes are and, thus, the more consistent the deliveries are. This cycle may lead to the increase of information flows in the SC, which is a strategic asset for chains that involve players located far from each other, as the ones considered here, along with the consolidation of goodwill trust and collaboration between partners.

The next information flow to be analyzed in this section is the one related with demand data. Considering the numbers in Table 10, it is possible to notice that the variation coefficient for this question is the lowest one in the section. At the same time, the means are not as high as the ones of inventory information and information systems integration.

Sharing demand information is crucial for the reduction of the bullwhip effect, as defined in Table 2. Through more accuracy regarding customer behavior and market trends, demand planning and forecasting become less erroneous activities. With lower level of errors in the

forecasts, it is possible to decrease demand uncertainty and, therefore, reduce safety stocks. Ultimately, this is translated as cost savings for the organization and enables the consolidation of a more efficient SC.

The inaccuracy of demand information causes distortions in the replenishment points of the upstream players in the SC, what increases the inventory levels progressively from distributor to supplier.

In the apparel industry, the inefficiencies caused by the bullwhip effect differ from one segment to the other. For basic products, with lower demand variability and larger order volumes, it is not extremely harmful for the garment manufacturers to maintain relatively high levels of inventory, given that the decoupling point can be delayed in order to promote some sort of customization. At the same time, keeping stock levels high translates in cost inefficiency in the SC and, consequently, may represent increases in the final prices charged from the customers. As this demand is considerably elastic, this situation can become a significant problem for the manufacturer, which may be obliged to reduce its margins in order to be competitive in the market.

For the other two segments, more inclined towards the premium market, maintaining high inventory levels also has upsides and drawbacks. On the one hand, large stocks can mean better service level and, therefore, better branding perception among the customer base. On the other hand, the high demand variability of these segments condemns much of this stock to be useless, with concrete possibilities of future needs to engage in sales and sharp margin reductions, even with potential negative effects on the company's branding.

Therefore, analyzing the bullwhip effect and trying to optimize inventory levels according to the required service level are strategic activities in demand planning for all the three segments of the apparel industry.

Back to Table 10, one element that draws the attention is the considerably higher variation coefficient for Brazilian clients in comparison with suppliers. Even though the means are pretty much the same, the dispersion of clients' responses is more perceptible than suppliers'. This means, therefore, that partnerships of Brazilian clients with Italian suppliers, for the respondents considered in this survey, tend to be underdeveloped when it comes to demand information exchange and, thus, have more space to grow with deeper levels of SC integration.

It is clear to notice, combining the results of demand and inventory information sharing, that there is a sub-optimization of the information flow in these SC's. Decoupling one kind of data

from the other leads to an incomplete understanding of the partner's scenario. For a supplier, for example, it is extremely strategic to combine information of the main client's demand and inventory levels. With the two of them, it is possible to dimension much better the level of safety stock, reordering points related to its suppliers, production capacity and also replenishment point for the client (through, for instance, integrated information systems and asymmetric decision-making process such as VMI).

The last element to be taken into account in this section of the analysis is the information flow related to production plans. If the numbers in Table 10 are used as input, it is possible to notice that this parameter has the lowest means and highest variation coefficients among the four variables of this section. Therefore, the numbers show that data concerning production plans is the least shared kind of information.

One explanation for this event could be that production plans are much more internal information than demand or even inventory. Sharing strategic data as this involves higher levels of trust in the partnership and requires goodwill, which, as was approached in the "Trust" section of this analysis, is not much diffused among respondents. In fact, this argument is coherent with the different results that clients and suppliers had in this variable. Clients present more resistance to share their production plans with suppliers, even if this activity could transform the supplier's production process much more customized and improve the quality standards being delivered.

Basically, a limiting factor for the enhancement of the information flow as a whole in the respondent's partnerships is the level of trust that exists in these SC's. In order for information flow to be optimized and adequately used by the different players in the SC, there are two mandatory elements that need to be present:

a) Adequate information systems: it does not seem to be a deal-breaker for the partnerships considered here, since the average level of information systems integration is adequate, even if it still can be improved. Nowadays, with the ascension of globalized communication systems, simpler software's or even on-line resources help companies integrate even when they are nestled far away from each other;
b) Adequate level of trust among partners: it is the main limiting factor here for the development of the information flow. The optimization of data usage occurs when different types of information are used together in order for the company to be able to draw an accurate scenario regarding its partners' needs and interests.

5.1.1.4 Decision-making process sharing

The next analysis refers to the decision-making structure in the partnership. Basically, here it will be possible to analyze if the players collaborate with each other along the value chain when it comes to decisions regarding sales/promotions, inventory policies and production plans. Besides that, considering the SC dimensions proposed in Table 1, an element concerning internal collaboration will be taken into account as well in order to understand if, among the respondents, it is a common practice to engage in internal alignment among departments so that the decision-making process involves all the potential interests existent in the organization.

There seems to exist significant differences between the responses regarding internal sharing and the other variables. Besides that, the variation coefficients for all variables seem to be relatively high considering to the other three dimensions already analyzed in this report.

In order to consolidate this analysis, the descriptive statistics for this dimension are displayed in Table 11.

	Player	Mean	Std. Deviation	Variation Coeff.
Sales and promotions collaboration	Supplier	2.11	0.93	44%
	Client	2.57	1.12	44%
	Total	**2.31**	**1.01**	**44%**
Inventory policies collaboration	Supplier	2.22	1.39	63%
	Client	2.57	0.98	38%
	Total	**2.38**	**1.20**	**51%**
Production plans collaboration	Supplier	2.33	1.22	52%
	Client	2.57	1.13	44%
	Total	**2.44**	**1.15**	**47%**
Internal collaboration	Supplier	2.89	1.05	36%
	Client	4.14	0.90	22%
	Total	**3.44**	**1.15**	**34%**

Table 11- Descriptive statistics for "Decision-making sharing"- Brazil with Italian partners

As mentioned before, considering the numbers above, it is clear, both through the higher averages and lower coefficient variations, that internal collaboration is the most diffused practice in this category. This is a great start for companies in this niche, considering that, as quoted in the “Goal congruence” section of this report, internal alignment regarding the strategic objectives is the first step for deeper levels of SC integration.

At the same time, **internal integration** depends basically on two main factors:

a) Internal collaboration among departments: according to Table 11, internal collaboration is the most common practice in this category, with higher averages and lower variation coefficients. Indeed, this provides a nurturing field for the

development of internal coherency regarding the company's main objectives and partners, what, ultimately, can lead to a deeper alignment of internal goals and more bargaining power in external partnerships;

b) Alignment of internal goals: as could be seen in the "Goal congruence" section, the alignment of internal goals among respondents is a significantly diffused practice among respondents.

Therefore, considering that both parameters are reasonably developed among respondents, it is possible to say that the internal SC integration is an upside of the companies being analyzed in this section. The definition of internal objectives and the collaboration among departments lead to a more assertive positioning in partnerships and, therefore, to better SC performance considering the company's own strategies and interests.

When it comes to collaboration regarding sales, inventory policies and production plans, the average levels are not high among respondents, with high variation coefficients. This means that these companies are not engaged in collaboration with their main Italian partners, what, ultimately, can hinder the SC's performance in a serious way.

One of the main factors influencing this lack of external collaboration can be the less-than-optimal practices regarding information sharing. As could be seen in the "Information sharing" section of this analysis, there is still not a culture of sharing key information with the Italian partners. This is a bottleneck for the collaboration process; without proper data and understanding regarding the partner's scenario, collaboration cannot develop, as can be seen in Figure 3, which shows the different levels of integration in the SC, with collaboration as the most developed stage.

Another element to be taken into account for the underdevelopment of decision-making sharing in these partnerships is, once again, the relatively low level of goodwill trust, as has been already approached in this report. This hinders the sharing of potential key information and, therefore, undermines the collaboration between partners, which is based on sharing of resources, information and business intelligence.

There are several touchpoints between partners that engage in a collaborative relation. The first one of them is the development of a front-end agreement to define expectations and aligned objectives. As can be seen in Table 9, the level of goal alignment is not very mature yet, what helps to explain the low levels of collaboration here. Without the adequate agreement between partners concerning expectations and common goals, collaboration is seriously hindered, up to the point where the relation gets strictly reactive, instead of pro-active.

The second touchpoint proposed by the CPFR model is the creation of a joint business plan, which relates directly with the alignment of objectives and expectations. In order for this plan to be created and implemented, it is essential that, at first, partners consider the relation relevant to their strategies and brand positioning, which was already approached here. After that, the next requisite is the existence of an adequate level of trust in the partner, in terms of quality, consistency and goodwill standards, which was already proven to be a bottleneck in the partnerships analyzed.

Therefore, the very basic steps of the collaboration process are jeopardized in the respondents' partnerships, what leads to low levels of decision-making sharing for the three kinds of information considered in this section (sales and promotions, inventory policies and production plans).

In order to better visualize the information contained in Table 11, the following graph is displayed.

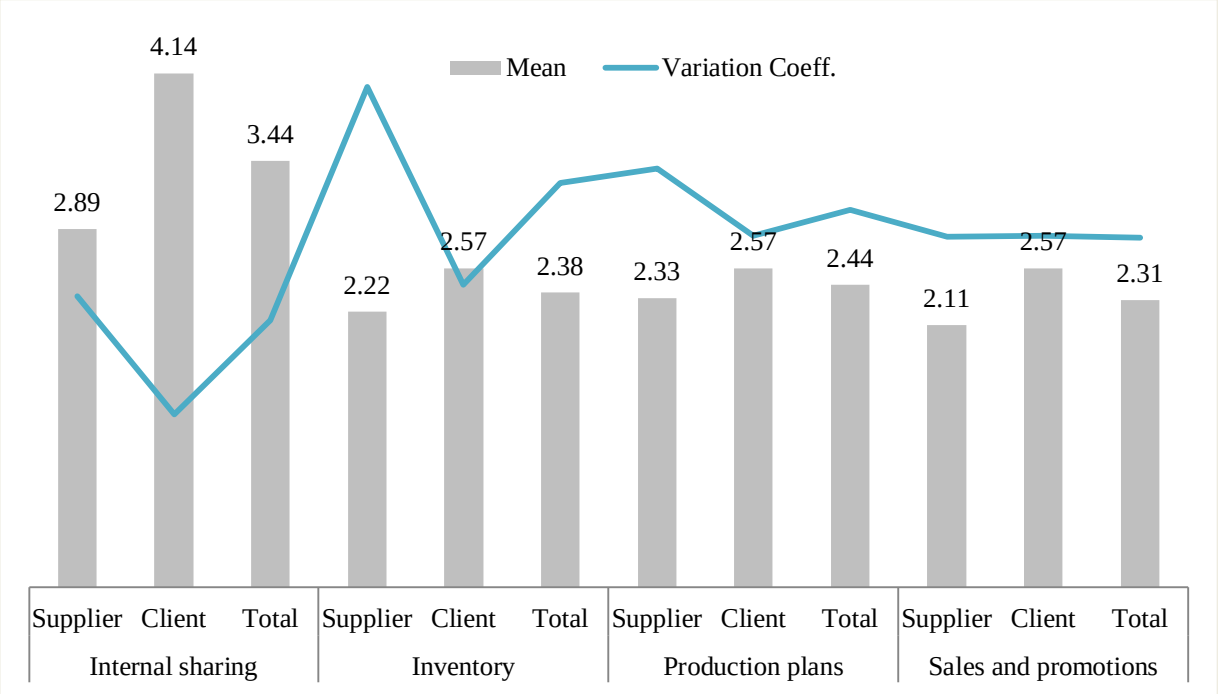

Figure 23- Comparison among "Decision-making sharing" variables- Brazil with Italian partners

All the analysis provided before is coherent with the graph plotted above, which basically shows how internal collaboration is more developed than the external one. This has to do with the lack of goal alignment in the partnerships and with the still-underdevelopment levels of goodwill trust, as commented before.

With the increase of goodwill trust and, consequently, of the information sharing in the partnership, more collaboration is expected. Thus, with higher levels of collaboration, SC

integration has a prolific field for growth and development and, with it, more efficient and responsive partnerships are expected to emerge.

5.1.1.5 Mutual development

The last parameter regarding SC integration assessment is mutual development. Basically, this part of the analysis refers to how much the respondent and its partner influence each other in their internal processes and to how much information is exchanged during product development.

The descriptive statistics for this section are displayed in Table 12.

	Player	Mean	Std. Deviation	Variation Coeff.
Product development information sharing	Supplier	2.56	1.01	39.7%
	Client	2.67	1.21	45.4%
	Total	**2.50**	**1.10**	**43.8%**
Partner's internal processes mutual development	Supplier	1.67	1.67	52.0%
	Client	2.86	0.90	31.5%
	Total	**2.19**	**1.05**	**47.9%**
Respondent's internal process mutual development	Supplier	2.22	1.39	62.7%
	Client	2.00	1.15	57.7%
	Total	**2.13**	**1.26**	**59.2%**

Table 12- Descriptive statistics for "Mutual Development" - Brazil with Italian partners

The level of mutual development is very low among respondents, with high variances. This can be interpreted as a result of low levels of collaboration, as identified previously.

With these low levels of collaboration, a potential inefficiency of these companies may be the opportunity cost they are incurring in the market. Just the fact of being companies located in a different country, which export their products to Italy is already a downside they have to bare in the apparel industry.

Especially in Italy, a country with a very large tradition in the fashion industry, the apparel industry is already very condensed. This makes it harder for an Italian retailer, for example, to engage in partnerships with offshore companies, unless they bring one of the following advantages:

a) Cost reduction: if retailers are able to buy a similar product from an offshore supplier, say a Brazilian one, at a lower price, it is certainly an advantage the company holds in the market. However, considering the responses of this survey, the low levels of collaboration, which reflects on little mutual development, prevent respondents and their partners to offer optimal and efficient SC structures to their final customers. The losses in scale, order consolidation and internal costs that arise from the lack of coordination between the parties create an expensive structure, in such a way that the

final prices tend to be inflated and less attractive both for the more downstream segments of the SC and for the final customers.

b) Better quality and consistency standards: the quality standards are directly linked to the service level offered to the final customers. This, on the other hand, depends on the market segment in which the company is inserted. As has been already approached before, the more high-end and demand-volatile the segment is, the higher the service level that needs to be provided. Considering that the levels of reliability and competency trust mapped in the respondents' partnerships are reasonably adequate, it is possible to understand that there is potential to deepen goodwill trust in order to increase collaboration levels. By doing that, product development and improvements in internal processes tend to occur in a more synergic way. This is, obviously, enhanced by the consolidation of information sharing in the SC. As the final result, the partnerships may become more flexible, with lower lead times and wastes in the production process and also with a leaner structure, as safety stocks are reduced thanks to smaller bullwhip effect implications.

5.1.1.6 Supply Chain Integration – Consolidated analysis

After the discussion of the results regarding SC integration conducted in the last sections, a consolidated analysis will be provided here so that the scenario in which the respondents are inserted can be more clearly assessed. In order to do that, the first step will be to build an adapted version of the Pareto graph for the elements discussed before. This is displayed below. It is interesting to clarify the color notation being used in the graph, according to the dimensions proposed by the SC 4C's model.

- Dark blue for "Trust";
- Light blue for "Goal congruence";
- Dark gray for "Information sharing";
- Medium gray for "Decision-making sharing";
- Light gray for "Mutual development".

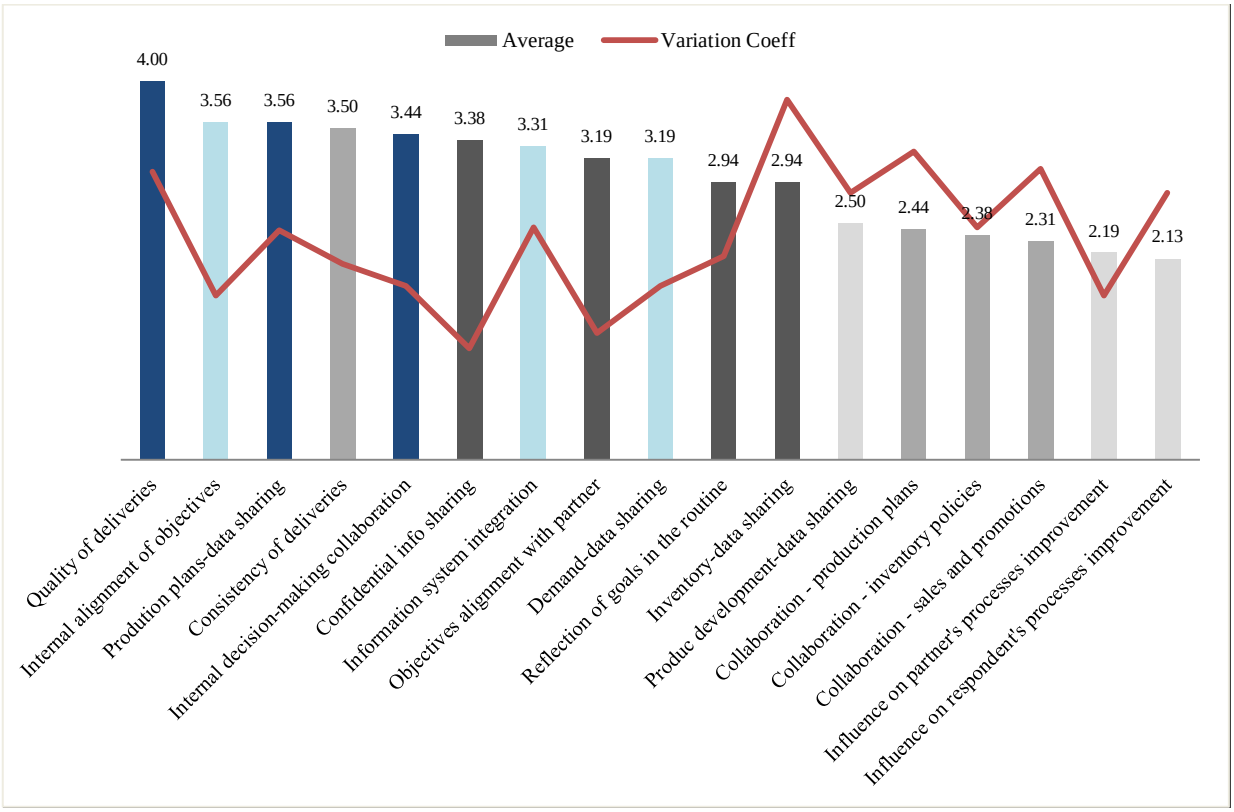

Figure 24- Adapted Pareto for Supply Chain Integration analysis- Brazil with Italian partners

The graph summarizes all the data discussed until now in the last sections. Based on this information, some considerations can be made, as follows:

a) There are basically two clusters in the graph when it comes to the variation coefficients. In general, the variables that are more developed in the partnerships have lower variation coefficients. This means that, in fact, the higher averages coincide with a more homogeneous distribution of responses. Consequently, it is possible to state that, indeed, the variables with highest averages are more consolidated practices among the respondents;

b) The levels of collaboration and mutual development are the lowest ones among all variables considered. The only exception for this pattern is the internal collaboration among departments, which has a good average and low variation. The main explanation for this outlier is that the level of internal collaboration is directly related to the internal alignment of objectives, which has the second largest average among all variables, along with one of the lowest variation coefficients;

c) The main bottleneck for the "Trust" segment is the level of goodwill trust. This situation, according to the SC 4C's model, act as one of the main limiting factors for the further development of SC integration among respondents, since more advanced levels of information sharing and collaboration are dependent upon this variable;

d) At the same time that the level of goodwill acts as an important bottleneck, the level of trust in the partner is in an evolving scenario, which is a good thing for companies. Having already surpassed the most basic stages of relationship trust, the further development of this variable may be a matter of time. Thus, the general expectation regarding SC integration practices among respondents is positive;
e) When it comes to the information infrastructure that enables information exchange between partners, it is possible to notice that the information systems are adequately prepared for integration implementation. There is, still, field to be improved in this element as well, but investments in SC integration only happen when the companies find them strategic. In order for massive expenses to be addressed to information systems infrastructure in the apparel value chain, supplier consolidation practices should be pursued first. As the supplier base is reduced and each one of them becomes more strategic in the value chain, it makes more sense to invest in SC integration infrastructure. It has been noticed that, in fact, the partnerships are relevant for Brazilian respondents (relevance coefficient of 1.94 out of 3) but, at the same time, they may be not strategic enough yet to justify larger CapEx in information systems at this point;
f) Another important limiting factor that can be identified is the lack of goals implementation in the partnerships analyzed. As already approached in this report, there is a high incidence of internal alignment among the departments and a relatively adequate level of goal congruence between respondents and their Italian main partners. However, when it comes to implementing the objectives defined in the first part of the CPFR model, the situation changes. This can be seen in the average reduction and variation increase that the variable “Reflection of goals in the routine” has in comparison with the other two elements of the “Goal congruence” dimension.
g) The last point to be considered here is that the information-sharing process is still underdeveloped in the partnerships analyzed, even if the infrastructure seems to be able to support this exchange of key data. The most diffused type of information shared, according to the responses, is data related to production plans, even if there is still much to do in this area as well. All of the variables regarding information sharing have relatively high variation coefficients and, therefore, the responses distributions are quite uneven for this field. This indicates that, at the same time, there are companies engaging in enriching information exchange, moving towards

collaboration, and companies with more difficulties to share key data with the Italian partners. Some causes for this have already been quoted, such as unilateral lack of openness and discrepancies in the relevance of the relation for each player.

The points quoted above give a pretty good overview of the stage in which the partnerships of the sample are in terms of SC integration. The next section is dedicated to the performance assessment, using the main dimensions proposed by the SCOR framework.

5.1.1.7 Performance indicators

Retackling the SCOR model, there are five macroprocesses to be assessed when analyzing performance in a SC scope. They are: plan, source, make, deliver and return. As explained in the "Method" section of this report, they were condensed in the questionnaire in three major sections: deliver, production and inventory costs and return. These dimensions are more suitable to the scope of this project, which is to assess the efficiency and effectiveness of a given partnership, given its integration level. The questions for each of these dimensions were presented in the "Method" section of this report.

Deliver

The questions for this dimension relate to delivery time, its variability and proportion of on-time deliveries. The descriptive statistics are provided in Table 13.

	Player	Mean	Std. Deviation	Variation Coeff.
Delivery time	Supplier	3.33	0.71	21.2%
	Client	3.43	0.79	22.9%
	Total	**3.38**	**0.72**	**21.3%**
Delivery time variability	Supplier	3.44	0.73	21.1%
	Client	3.71	1.25	33.7%
	Total	**3.56**	**0.96**	**27.1%**
On-time deliveries	Supplier	4.22	0.67	15.8%
	Client	4.00	1.00	25.0%
	Total	**4.13**	**0.81**	**19.5%**

Table 13- Descriptive statistics for "Delivery" - Brazil with Italian partners

As can be noticed in the table above, the performance indicators that refer to the delivery process are reasonably well positioned in comparison with the other dimensions already analyzed until now. The average variation coefficients lay between 20% and 30%, which is a considerably good reference. These elements, however, can be further improved with the implementation of deeper SC integration practices, involving mainly the topics approached in the last section, such as the lack of goodwill trust and flawed goal implementation processes.

Considering the open-ended topics of the questionnaire, it is possible to assume that one of the main causes for the delivery time to be lowest-average variable is the physical distance existent between Italy and Brazil. This is a drawback intrinsic to the nature of these

partnerships that needs to be overcome through synergies and lateral upsides that compensate this aspect. These potential advantages can be related to pricing points, quality standards, consistency of deliveries, decrease of inventories and so on.

The main conclusion from this part of the analysis is that, even though there is still field to be improved, the "delivery" macro-process does not act as a bottleneck in terms of the overall performance of the partnerships. This is, however, still a very strategic issue to be addressed by respondents, considering that even small improvements in this dimension can have huge effects on the overall efficiency of the SC.

An example of this impact is the decrease of safety stock. Knowing that safety stocks depend directly on demand uncertainty (which can be addressed more by information sharing and collaboration initiatives) and suppliers' lead time variability, it is essential for companies to engage in the creation of synergies to reduce the overall lead time variability and, therefore, reduce safety stock. The general expression that relates these variables is provided below.

$$Safety\ Stock = z_\alpha\ x\ \sqrt{E(L).\ \sigma_D^2 + (E(D))^2.\sigma_l^2}$$

As can be seen in the expression above, the level of safety stock depends directly on both the average lead time and its variability. Therefore, as said before, the engagement in synergies and decrease of these variables result in a leaner structure and, thus, less costly.

At the same time, the replenishment policy is also directly affected by delivery practice and patterns. The reorder point is calculated as follows.

$$Reorder\ Point = E(L).E(D) + Safety\ Stock$$

Therefore, as proven by the expressions presented here, it is important for companies to reduce average lead times and the overall variability involved in this process. Since there is still not an optimal situation among respondents, one of the main objectives these companies should pursue relate to the comprehension regarding which of the SC integration practices considered in this report are positively correlated with the delivery parameters and invest in synergies creation according to these specific parameters. An analysis regarding this relation between the SC integration variables and the performance indicators will be provided ahead in this report.

Inventory costs

There are three questions regarding this dimension, which verse about how profiting the partnership is in terms of purchase prices, inventory management and the partner's efficiency to adapt and modify products. The descriptive statistics are provided below.

	Player	Mean	Std. Deviation	Variation Coeff.
Advantages in purchase prices	Supplier	3.56	0.71	21.2%
	Client	3.14	0.79	22.9%
	Total	**3.38**	**0.72**	**21.3%**
Inventory management advantage	Supplier	2.89	1.05	36.5%
	Client	2.86	1.07	37.4%
	Total	**2.88**	**1.02**	**35.6%**
Product development efficiency	Supplier	3.44	1.13	32.8%
	Client	3.29	0.49	14.9%
	Total	**3.38**	**0.89**	**26.2%**

Table 14- Descriptive statistics for "Inventory and production costs"- Brazil with Italian partners

The table above shows that efficiency in the partnerships considered is still far from optimal. The lack of deep stages of integration increases uncertainty, inaccuracies in forecasting processes (bullwhip effect), stock levels and, consequently, hinders the optimization of inventory levels in both players of the commercial relation.

This is especially more critical in an industry as dynamic as the apparel one, whose demand patterns tend to vary significantly from one season to the other and stocks can become obsolete pretty fast. Therefore, keeping excessive levels of inventory is a burden for a garment manufacturer in a very buyer-driven environment.

Another effect of shallow integration is the lack of order consolidation, as little trust in the same supplier/ client is developed. This can be seen though the variable “advantages in purchase prices”. Besides that, the time necessary and the resources used in order to modify products features are also not optimized, since demand patterns are perceived with a relative delay, given the difficulty for partners to share demand information and collaborate when it comes to sales and promotions.

Return

The last dimension when it comes to performance indicators concerns devolution. There are three questions regarding this theme and they verse about devolution rate, replenishment time after a devolution occurance and the control system put in place by respondents to make sure the root causes for a devolution occurance are identified and trigger exception control mechanisms (as proposed by the CPFR model).

The descriptive statistics for these questions are provided below.

	Player	Mean	Std. Deviation	Variation Coeff.
Devolution rate	Supplier	3.78	0.67	17.6%
	Client	4.57	0.53	11.7%
	Total	**4.13**	**0.72**	**17.4%**
Replenishment time after devolution	Supplier	3.44	1.13	32.8%
	Client	4.00	1.00	25.0%
	Total	**3.69**	**1.08**	**29.2%**
Exception control mechanisms triggered by devolution	Supplier	3.67	1.12	30.5%
	Client	4.14	0.69	16.7%
	Total	**3.88**	**0.96**	**24.7%**

Table 15- Descriptive statistics for "Return" - Brazil with Italian partners

Considering devolution an exception occurance in the value chain, it is possible to conclude that, for this dimension, the partnerships seem to be quite successful, given that averages are considerably higher than the ones calculated before for the other dimensions. At the same time, the distribution dispersion is significantly lower, with the largest part of answers concentrated in medium-high grades.

The lowest-rated element in the table above corresponds to replenishment time, which is not only dependent on the control system put in place when a devolution occurs, but also on additional factors such as production process variables, procurement practices in order to purchase the raw material necessary for the reproduction of the rejected good, exogenous factors related to transportation means, border control and so on.

Therefore, it is possible to understand that devolution is indeed an exception process in the partnerships considered here, what is coherent with the fact that reliability trust is already consolidated among respondents and their Italian partners (as was shown in the “Trust” section of this analysis).

As for a diagnosis of the respondents’ partnerships when it comes to these performance indicators, it is possible to conclude the following points.

a) Little efficiency in inventory management;
b) Little profiting from order consolidation and better purchase prices;
c) Good practices and control mechanisms regarding devolution;
d) High proportion of on-time deliveries, directly related to consolidated levels of competency and reliability trust;
e) Less-than-optimal lead times, with reasonable variability. Since this is an essential issue to increase efficiency, more attention ought to be given to these parameters.

5.1.1.8 Roadmaps – Suggestions for improvement

Considering the main inefficiencies identified previously and the table with the highest correlation coefficients between SC integration variables and the performance indicators, it is possible to draw a roadmap for the improvement of the overall results of the partnerships. The table showing the correlations follows.

Supply Chain Integration parameters	Performance indicators	Correlation coefficients
Collaboration - sales and promotions	Delivery Times Variability	0.83
Information system integration	Inventory management advantage	0.71
Confidential info sharing	On-time deliveries	0.70
Reflection of goals in the routine	Inventory management advantage	0.69
Inventory info sharing	Inventory management advantage	0.69
Internal alignment of objectives	Inventory management advantage	0.68
Prod. Plan info sharing	Inventory management advantage	0.68
Influence on partner's processes improvement	Devolution rate	0.68
Information system integration	Delivery Times Variability	0.67
Collaboration - inventory policies	Delivery Times Variability	0.67
Internal alignment of objectives	Delivery Times	0.64
Prod. Plan info sharing	Delivery Times	0.64
Confidential info sharing	Replenishment time after devolution	0.62
Confidential info sharing	Problem resolution after devolution	0.62
Influence on respondent's processes improvement	Product development efficiency	0.61
Information system integration	Delivery Times	0.60
Quality of deliveries	Replenishment time after devolution	0.59
Quality of deliveries	Problem resolution after devolution	0.59
Reflection of goals in the routine	Delivery Times Variability	0.59
Inventory info sharing	Delivery Times Variability	0.59
Influence on partner's processes improvement	Replenishment time after devolution	0.59
Influence on partner's processes improvement	Problem resolution after devolution	0.59
Confidential info sharing	Delivery Times Variability	0.55
Collaboration - inventory policies	Product development efficiency	0.55
Demand info sharing	Delivery Times	0.55
Influence on respondent's processes improvement	Delivery Times Variability	0.54
Objectives alignment with partner	Replenishment time after devolution	0.54
Demand info sharing	Replenishment time after devolution	0.54
Objectives alignment with partner	Problem resolution after devolution	0.54
Demand info sharing	Problem resolution after devolution	0.54
Confidential info sharing	Product development efficiency	0.54
Consistency of deliveries	Inventory management advantage	0.53
Objectives alignment with partner	Inventory management advantage	0.53
Demand info sharing	Inventory management advantage	0.53
Reflection of goals in the routine	Delivery Times	0.53
Inventory info sharing	Delivery Times	0.53
Demand info sharing	Delivery Times Variability	0.53
Reflection of goals in the routine	On-time deliveries	0.52
Inventory info sharing	On-time deliveries	0.52
Confidential info sharing	Inventory management advantage	0.52
Influence on respondent's processes improvement	On-time deliveries	0.51
Quality of deliveries	Delivery Times	0.51
Internal alignment of objectives	Delivery Times Variability	0.50

Table 16- Correlation between SC integration and performance indicators - Brazil with Italian partners

The main elements to be considered when suggesting ways to improve the partnerships' results are:

a) Improvement of inventory planning to reduce average cycle and safety stocks;
b) Improvement of lead times and decrease of variability (consequently, decrease of in-transit inventory);
c) Enhancement of cost advantages related to supplier consolidation.

Therefore, considering the main correlation coefficients presented in Table 16, which can be used in order to define action plans and priorities in terms of implementation of integration practices, and these sources of inefficiency, the following roadmaps can be suggested.

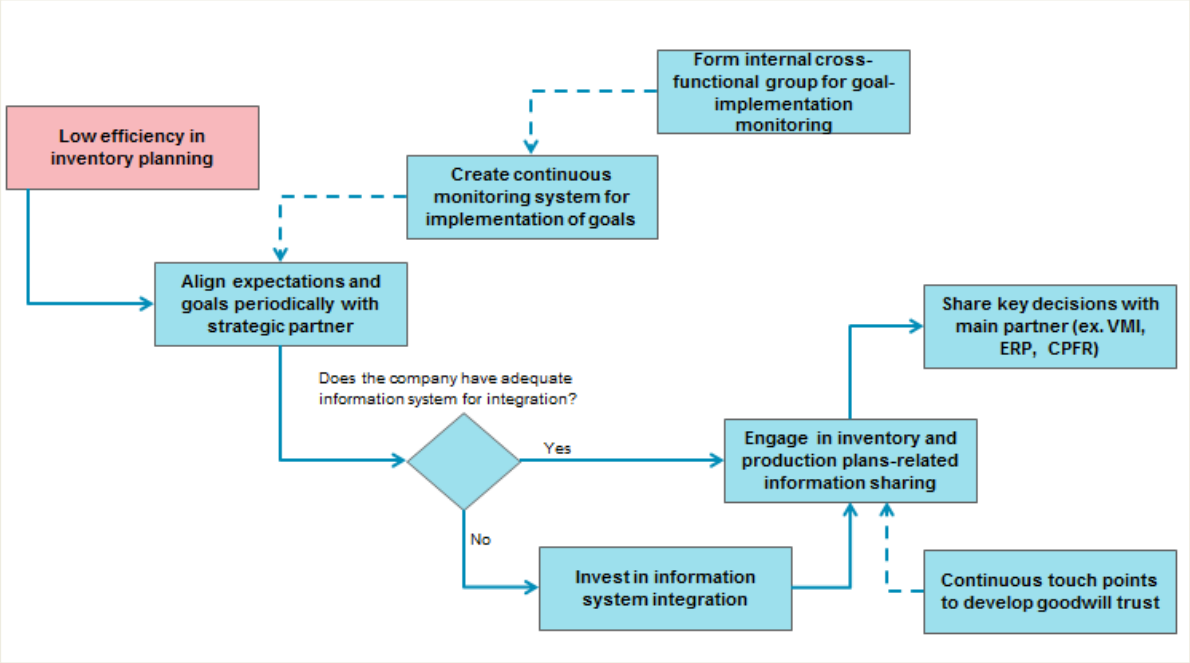

Figure 25- Roadmap for inventory planning improvement - Brazil with Italian partners

The roadmap provided above addresses the issue of low efficiency in inventory planning and, therefore, tackles the need to share information and collaborate in the stock-related decision-making process. Basically, as the correlations show, goal alignment and its implementation are fundamental for deeper levels of integration. Therefore, the first step is to make sure that the goals are clear and implemented, in such a way that both the internal and external players know exactly what the organizations' interests and strategies are. A way to conciliate the internal and the external views is to define a cross-functional group to monitor continuously how goals are changing and how the company's daily activities reflect the partnership's interests. The best practice is for this group to keep in close touch with representatives from the partner in order to make sure that goals stay clear and aligned in time.

After that, having defined and implemented the objectives, the company needs to make sure that its information system infrastructure is adequate for real-time key data sharing. Given this, inventory and production plans-related information should be shared so that uncertainty in the value chain can be reduced and, therefore, more efficient levels of stock can be kept by both players. The last stage of this roadmap is the engagement in collaboration practices in order for the partner to have a complete understanding concerning the other's scenario. Some examples provided are coordination softwares such as VMI, which reduces drastically the uncertainty from the supplier's side and, at the same time, the costs and supplier's lead time variability from the client's point of view.

The second roadmap addresses the other two pain points identified before: the need for lower lead times and variability, along with order consolidation to profit from scale effects. The figure below displays this roadmap.

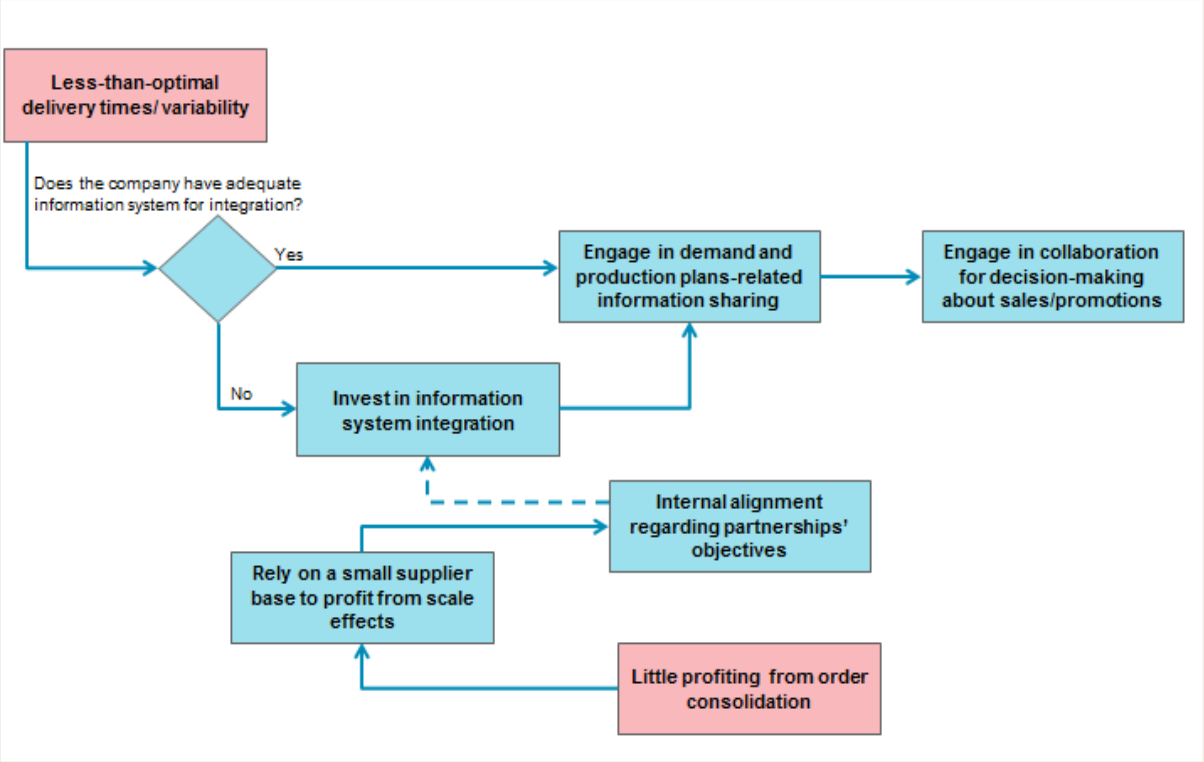

Figure 26- Roadmap for delivery times and order consolidation improvement - Brazil with Italian partners

Finally, this last roadmap tackles the need for respondents to decrease delivery times and their variability. Considering the main correlation coefficients related to these indicators, the roadmap was elaborated. It is essential for companies to maintain adequate information systems, so that exchange of data and integration can be pursued. Given that the company has the infrastructure necessary, the company needs to assess what its objectives are when it comes to its strategic partnerships. If it is possible for the company to profit from scale effects

based on orders consolidation, one interesting strategy is to reduce the number of suppliers, so that volume discounts can take place.

The amount of information shared regarding demand patterns and production plans are directly dependent upon the company's internal goal alignment. Thus, if the organization finds it strategic to engage in supplier consolidation and development, very good benefits can be obtained and a more efficient partnership can arise.

After the definition of the internal objectives, information sharing must take place, especially regarding data about demand patterns and production plans so that the partner can have a more accurate outlook concerning customer behavior, PoS data and so on. With this input, it is possible to better forecast replenishment points and, therefore, engage in a knowledge-based relation in the partnership. As a consequence, the variability of delivery times decreases, what results in a better service level for the downstream segments of the SC.

The last stage of this roadmap is to engage in collaborative practices with the partner so that key decisions can be made together and, therefore, performance indicators can be more suitable for both players' interests and goals. Basically, the ultimate results of this roadmap are the decrease of overall lead times, lower levels of safety stock and more reliable performance.

5.1.2 Analysis for Italian respondents with Brazilian partners

The same kind of analysis conducted for Brazilian respondents with Italian partners will be done for the opposite way around.

In order to understand the average relevance of these partnerships for Italian respondents, the relevance coefficient is calculated, as was done for Brazilian companies previously. Considering the distribution displayed in Figure 27, an average relevance level of 1.42 can be obtained, which is significantly lower than the coefficient gotten for Brazilian respondents (1.94). Therefore, the main conclusion is that the importance of the commercial relations among respondents is higher for Brazilian companies with partnerships with Italian players than vice-versa. This will be an interesting element to take into account when trying to understand the level of integration and the causes for potential inefficiencies.

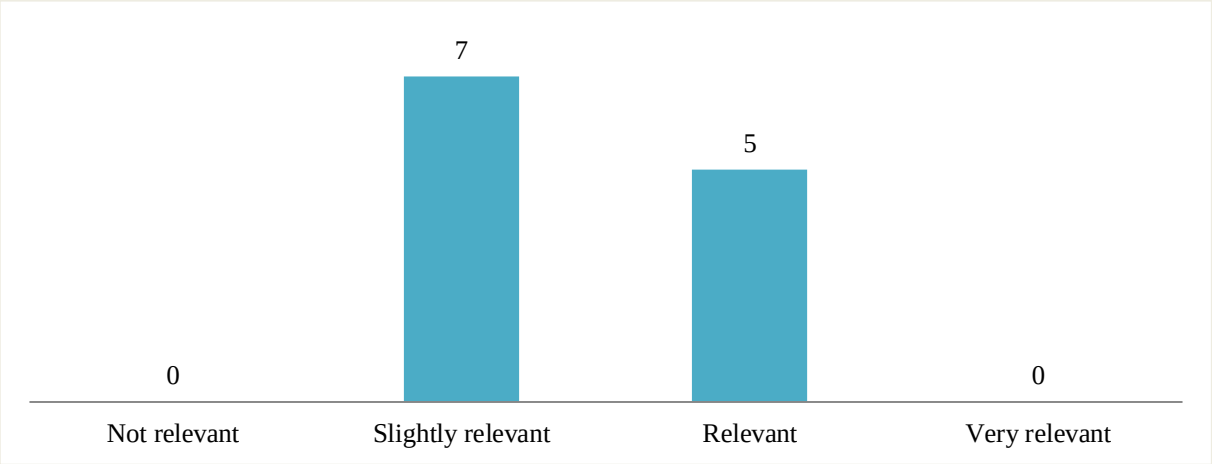

Figure 27- Relevance distribution- Italy with Brazilian partners

The next step is to map the level of integration for this segment of respondents. In order to do this, the SC 4C's model's dimensions will be used again.

5.1.2.1 Trust

When it comes to trust, it is possible to see that the overall level of trust for Italian respondents with Brazilian partners is considerably lower than the ones analyzed before. This is coherent with the lower average relevance that the partnerships have in this segment in comparison with the other one. As has already been approached, the less strategic the partnership, the less integration initiatives are present. The descriptive statistics for this dimension are in Table 17.

	Player	Mean	Std. Deviation	Variation Coeff.
Consistency of deliveries	Supplier	4.50	0.55	12.2%
	Client	3.17	0.98	31.0%
	Total	**3.83**	**1.03**	**26.9%**
Quality pattern of deliveries	Supplier	4.33	0.82	18.8%
	Client	3.00	1.10	36.5%
	Total	**3.67**	**1.15**	**31.5%**
Confidentiality of information sharing	Supplier	3.17	1.47	46.5%
	Client	2.83	0.98	34.7%
	Total	**3.00**	**1.21**	**40.2%**

Table 17- Descriptive statistics for "Trust"- Italy with Brazilian partners

It is clear to see that the main bottleneck in this dimension continues to be the low level of goodwill trust. Considering that this variable is dependent upon both players in the partnership, since key information sharing is a bilateral process, it is logical that the overall level of confidentiality here continue low, knowing that the same partnerships, from the point of view of Brazilian respondents, were assessed as not much confidential.

An interesting additional element to consider, however, is that competency and reliability forms of trust remain relatively high in this segment as well, with even higher levels of

delivery consistency for suppliers in comparison with the Brazilian point of view. Therefore, the conclusion for this analysis is similar to the one before: trust is an evolving issue for Italian companies in the apparel industry in their relations with Brazilian partners, which still lack better levels of goodwill and key information exchange.

It is interesting to highlight that, according to respondents, Italian suppliers' perception about their deliveries consistency is much more positive than the perception clients have regarding Brazilian suppliers. The same thing happens with the quality standards being delivered. According to Italian suppliers, their quality patterns have an average of 4.33, while clients' perception concerning Brazilian suppliers' deliveries has an average of 3.00, which is considerably lower.

At the same time, when considering the statistics in Table 7, it is possible to see that Brazilian clients have a much lower assessment regarding Italian suppliers' delivery consistency (4.50 against 3.71). This shows that, in general, there is communication ineffectiveness in the partnership, where Brazilian clients expect more consistent deliveries while Italian suppliers already think their actual performance is great. This is a result of flaws in the first stages of the CPFR model, according to which goals and expectations must be aligned right at the beginning of the partnership and a joint business plan must be created.

Therefore, in order to tackle this expectation asymmetry, some possible initiatives that could be adopted are the investment in information infrastructure in order to enable easier and real-time communication with the partner, incentives to physical meetings between representatives of both players, with potential development of events in order to increase branding, empathy and information sharing, such as workshops, off-sites and so on.

Besides that, in order to improve integration levels between Brazilian and Italian players in the apparel industry, more attention to culture alignment and creation of synergies must exist. Without these elements, companies do not share strategic information, given the risk this activity involves and, therefore, deeper integration is hindered (what is proven by the low level of goodwill trust).

All of these recommendations, obviously, depend on how strategic each partnership is for the company. If the order volumes are low and the benefits from SC integration and supplier consolidation, marginal, the investments and risks involved in infrastructure enhancement and information disclosure may not have a profitable "cost x benefits" binomial. On the other hand, if the possibility to profit from scale effects due to supplier consolidation is large and the market is very elastic when it comes to prices or requiring for high service levels in terms

of lead times, customization possibilities and specification meeting, integration is likely a strategic way for a company to differentiate itself in the market.

5.1.2.2 Goal congruence

The next dimension is goal congruence. There has already been some discussion in the last section regarding the flawed process of expectation alignment and joint creation of a business plan, given the differences in consistency perception between Italian and Brazilian players. The rationale was that this was due to poor goal congruence or issues concerning the implementation of these objectives in real life.

This can be seen in the table displayed below.

	Player	Mean	Std. Deviation	Variation Coeff.
Partnership objectives clarity	Supplier	3.17	0.75	23.8%
	Client	3.00	0.63	21.1%
	Total	**3.08**	**0.67**	**21.7%**
Reflection of objectives on daily activities (routine)	Supplier	3.00	0.63	21.1%
	Client	2.33	0.82	35.0%
	Total	**2.67**	**0.78**	**29.2%**
Internal alignment of company's objectives	Supplier	4.00	0.63	15.8%
	Client	3.67	0.82	22.3%
	Total	**3.83**	**0.72**	**18.7%**

Table 18- Descriptive statistics for "Goal congruence"- Italy with Brazilian partners

As can be seen in the table, the diagnosis for the first analysis is also kept here. Even if the internal alignment is well developed among Italian respondents, this does not translate into implemented initiatives to enhance SC integration, especially among Italian clients.

Through a comparison of the statistics presented, it is possible to notice that the overall level of external goals alignment is lower among Italian respondents. One of the main reasons for this, as has already been tackled in this report, is the considerable difference between the relevance coefficients for the two segments.

Besides that, it is also important to highlight that, when it comes to clarity of the partnership objectives, Italian and Brazilian players seem to have compatible expectations, given that differences between the two segments are not very significant, even if the responses distribution for Italian respondents is considerably more disperse.

One more factor that demonstrates that there is less interest in SC integration with Brazilian players is the high level of internal alignment that Italian companies have shown. Therefore, even if there is a culture of sharing information internally and defining clear partnership policies in the internal environment, this culture does not appear in the interfaces Italy-Brazil among respondents being considered. There are two basic main causes for this, as follows.

a) Lack of interest in SC integration, given that partnerships are less strategic and costs/ burdens related to integration initiatives are larger than the expected benefits;
b) Exogenous factors such as macroeconomic variables (tariffs, quotas, currency instability and so on), which are surely present in an international business scenario, especially considering the current Brazilian economic and political environments. This may jeopardize Brazilian imports but, on the other hand, the Brazilian currency depreciation also means increase of exports to the EU. Therefore, given that these external variables will not be under respondents' control even with the implementation of best practices in terms of SC integration, this situation will not be assessed in this report.

5.1.2.3 Information sharing

This section concerns information sharing according to Italian respondents. The descriptive statistics for this dimension are provided in Table 19.

	Player	Mean	Std. Deviation	Variation Coeff.
Demand information sharing	Supplier	2.50	1.05	42.0%
	Client	2.17	0.75	34.7%
	Total	**2.33**	**0.89**	**38.0%**
Inventory information sharing	Supplier	2.83	1.17	41.3%
	Client	2.67	0.82	30.6%
	Total	**2.75**	**0.97**	**35.1%**
Production plans info sharing	Supplier	2.67	1.51	56.5%
	Client	2.33	1.21	51.9%
	Total	**2.50**	**1.31**	**52.6%**
Information systems integration	Supplier	3.50	1.05	30.0%
	Client	2.83	0.75	26.6%
	Total	**3.17**	**0.94**	**29.6%**

Table 19- Descriptive statistics for "Information sharing" - Italy with Brazilian partners

Analyzing the data in the table above, it is possible to notice that information sharing is not a diffused practice among Italian respondents, even if the infrastructure to exchange data exists. The values in the table are coherent with the results obtained for Brazilian respondents, which also showed that there is not such a culture in the Italian-Brazilian partnerships.

As was approached before, insufficient information sharing leads to strong inaccuracies from one level to the other in the SC, which translate into the amplification of the bullwhip effect, higher inventory levels and worse service level (with higher and more variable lead times). The relation existent between these indicators and the amount of information sharing in the

partnership was explicitly shown in Table 16, with correlation coefficients of up to 0.83 (very strong correlation).

When it comes to the comparison between Italian and Brazilian responses, it is possible to notice that information infrastructure is slightly more developed among Brazilian respondents and that Brazilian companies stated higher levels of information sharing in all three categories. These differences originate from natural divergences concerning the limited number of choice possibilities of the Likert scale, which was used in the questionnaire. This relative subjectivity is an important drawback to be taken into account in these comparison analyses. Slightly different averages do not necessarily mean real-life changes.

Therefore, the infrastructure may not present real significant differences between Brazilian and Italian respondents. At the same time, for all three categories of information sharing, significant differences between the two segments were identified. Once again, the two main potential causes for this situation are described below.

a) Lack of expectations alignment at the beginning of the partnership, which might be a reflection of the lower relevance level;
b) Asymmetric information sharing. This can be seen, for example, in the differences between the values for Italian suppliers and Brazilian clients, which constitute the same kind of partnership. In fact, for demand-related information, for example, Italian suppliers have 2.50 against 2.86 for Brazilian clients.

5.1.2.4 Decision-making process sharing

The last dimension of the SC 4C's model is related to the decision-making process. The descriptive statistics are provided in Table 20.

	Player	Mean	Std. Deviation	Variation Coeff.
Sales and promotions collaboration	Supplier	2.33	1.21	51.9%
	Client	2.17	1.17	54.0%
	Total	**2.25**	**1.14**	**50.6%**
Inventory policies collaboration	Supplier	2.33	1.03	44.3%
	Client	1.83	0.75	41.1%
	Total	**2.08**	**0.90**	**43.2%**
Production plans collaboration	Supplier	2.17	1.17	54.0%
	Client	1.67	1.21	72.7%
	Total	**1.92**	**1.16**	**60.8%**
Internal collaboration	Supplier	3.67	0.82	22.3%
	Client	2.83	0.75	26.6%
	Total	**3.25**	**0.87**	**26.6%**

Table 20- Descriptive statistics for "Decision-making process sharing"- Italy with Brazilian partners

The main message the statistics transmit is the existence of alarming non-collaborative partnerships among Italian respondents and Brazilian players. All averages here were considerably coherent with the ones calculated for Brazilian respondents. Comparing the category “Supplier” for Italian players with “Client” for Brazilian, it is possible to analyze the differences of perception and the asymmetries existent in the relation, as has been done in the previous sections.

Conducting a similar analysis here, it is possible to notice that the most critical parameter is the collaboration concerning production plans-related decisions in the “Brazilian suppliers – Italian clients” segment. Knowing that the commercial flow involved in this segment is mostly composed of basic products, with a very fragmented supplier and customer base, it is reasonable to assume that there is not such an integration culture in this environment. At the same time, given the expectations of depreciation of the Brazilian currency in the medium term, it seems like a strategic move for Italian players to invest in integration with Brazilian suppliers, since exports tend to become cheaper in the near future and compensate the potential costs and risks involved in SC integration.

At the same time, it is important to consider that Brazil has a very dynamic apparel industry, which is very fragmented and has relatively small entry barriers. Consolidating the relation with an Italian customer, which may provide knowledge regarding exporting practices, fiscal policies and even potential branding in an extremely valuable fashion market such as the Italian one, may determine the fate of small Brazilian suppliers and, as approached before, mean the difference between evolving from the position of assembler to a potential OBM or stagnating in the value chain.

However, in order to engage in these win-win commercial relations, both parties need to be open to the partnership and willing to allocate resources to develop trust and infrastructure required for SC integration. Given the relatively small relevance of these relations perceived by Italian respondents, a very important bottleneck appears for the development of these partnerships.

The solution for this situation is complex and does not involve only SC-related issues. On contrary, external factors, politic stability, alternative countries and core strategies of Italian companies are some of the limiting factors that hinder better performance of Brazilian suppliers and help to explain the already-commented lack of openness of Italian suppliers, an issue identified through the open-ended section of the questionnaire.

Some potential corrective initiatives that might help to enhance Brazilian attractiveness for Italian players are:

a) Political stability in order for currency fluctuations not to hinder international commercial flows, especially in industries as the apparel, where suppliers are quite easily replaced by players in low-cost countries, such as the Philippines, for example;
b) Reconsideration of protectionist economic measures, such as commercial tariffs and quotas, which may hinder international players' competitiveness in Brazil. This is especially important for the apparel industry, composed of a huge price-sensitive segment, that would easily replace international suppliers by local companies with better prices;
c) Incentives to the development of local independent stores, which act as an extremely important distribution channel for the commercialization of Italian products in the Brazilian market. Some initiatives could be oriented-aid by BNDES (Banco Nacional de Desenvolvimento), with higher availability of loans with lower interest rates and creation of local franchises, open to Italian imports;
d) Decrease of the role of intermediaries, which has already been happening naturally thanks to the diffusion of the Internet and the easier forms of contact between partners via on-line tools. The leaner SC reflects in more efficient results, with lower lead times and price reduction/ margin increase.
e) Organization of clusters to help raise resources to invest in SC integration. Instead of competitive relations between local suppliers, a co-opetitive SC could help the industry as a whole to become more integrated with international players and, therefore, the overall results for the customer would be better, with more products options, potentially at lower prices.
f) Focus company's strategy on promising partners, in such a way that order volumes can be consolidated with the increase of trust and communication in the partnership, with a continuous knowledge and information flow between parties.

5.1.2.5 Mutual development

The last section of the SC integration analysis related to mutual development. The statistics are provided below.

	Player	Mean	Std. Deviation	Variation Coeff.
Product development information sharing	Supplier	2.67	1.03	38.7%
	Client	2.17	0.75	34.7%
	Total	**2.42**	**0.90**	**37.3%**
Partner's internal processes mutual development	Supplier	2.17	0.98	45.4%
	Client	2.33	1.37	58.6%
	Total	**2.25**	**1.14**	**50.6%**
Respondent's internal process mutual development	Supplier	1.83	0.75	41.1%
	Client	1.17	0.41	35.0%
	Total	**1.50**	**0.67**	**44.9%**

Table 21- Descriptive statistics for "Mutual development" - Italy with Brazilian partners

As expected, given the "decision-making process sharing", the results are very low for "mutual development" too. It is possible to see that there is little influence on the partner's internal processes and vice-versa. This is obvious, since this kind of activity is merely the result of a goodwill-oriented partnership, with high levels of information sharing.

Besides that, the level of collaboration for product development is also low both for clients and suppliers, which is coherent with the statistics obtained for Brazilian respondents previously.

There are not new conclusions in this table, given that it was already diagnosed that mutual development is not yet mature in the Brazilian-Italian partnerships among respondents and these statistics reiterate this statement.

5.1.2.6 Supply Chain Integration – Consolidated analysis

After the discussion of the results regarding SC integration levels conducted in the last sections, a consolidated analysis will be provided here. In order to do that, an adapted version of the Pareto graph will be elaborated, as was done for Brazilian respondents. It is interesting to clarify the color notation being used in the graph:

- Dark blue for "Trust";
- Light blue for "Goal congruence";
- Dark gray for "Information sharing";
- Medium gray for "Decision-making sharing";
- Light gray for "Mutual development".

The graph with all SC integration variables for Italian respondents with Brazilian partners follows.

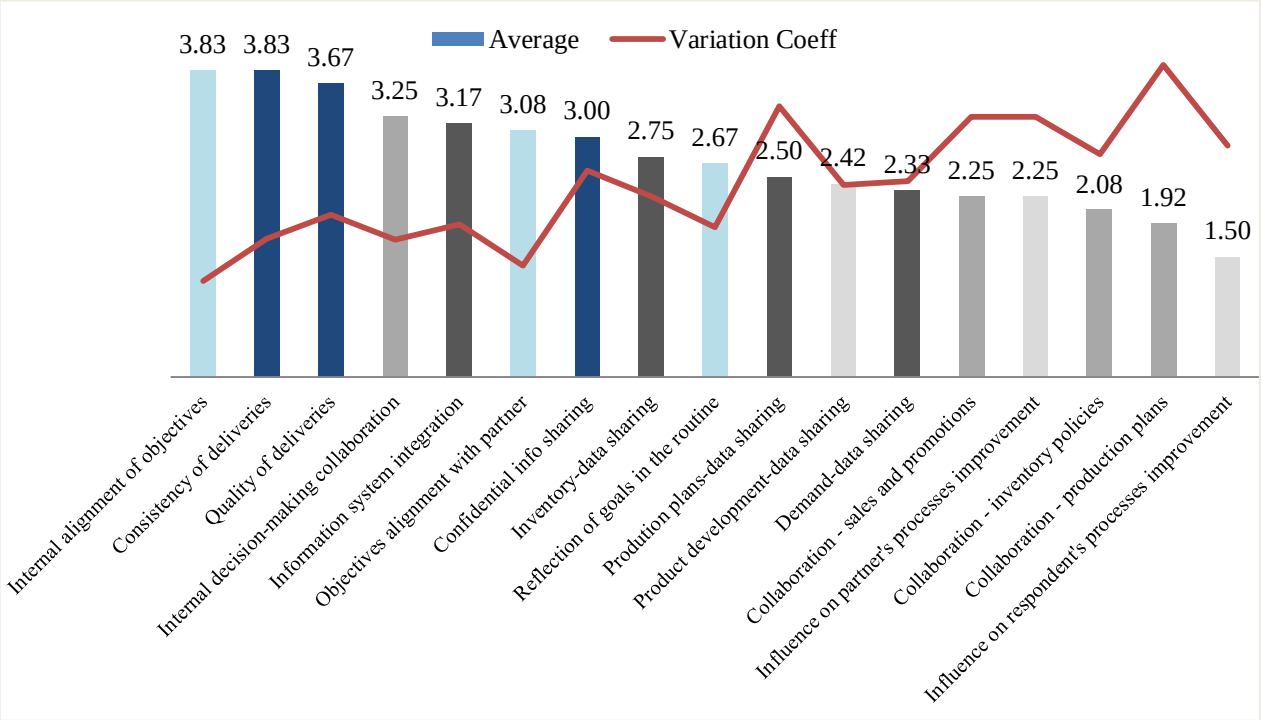

Figure 28- Adapted Pareto for Supply Chain Integration - Italy with Brazilian partners

Analyzing the consolidated graph, it is clear, as for Brazilian respondents, that there are two major clusters of variables: the first one has high averages and lower variation coefficients, which represent more developed stages of SC integration, while the second group has lower averages and higher variation coefficients, meaning that these aspects are not yet consolidated and should be further developed.

There are some points to be analyzed when this graph is compared to Figure 24. The most significant ones are quoted and explained below.

a) The overall level of trust is comparable between the two graphs. The main bottleneck in this dimension is indeed the lack of consolidated levels of goodwill trust and, therefore, sharing of key information;

b) Collaboration and mutual development continue to be lowest-rated elements, what shows that the integration in these partnerships is still evolving and has not yet reached deeper levels. Decision-making is still mostly myopic, i.e. the company's own interests are considered, with little or no regards to the partner's goals;

c) Information-sharing averages have decreased considerably from the first graph to this one. This might represent the asymmetric engagement in SC integration initiatives. As can be noticed through the comparison between the graphs, Italian respondents are more resistant to share key information with Brazilian suppliers and clients. Potential explanations for this situations have been approached before in the report and include the difference in relevance levels, nature of the commercial relation (Italy is in a

central geographic position and, therefore, replacing Brazilian suppliers may not only be easy in terms of alternative options, but also even cost-efficient, considering the high transportation costs of product transferring between Brazil and Italy (and vice-versa));

d) The overall results for Italian respondents are quite similar to the ones obtained for Brazilian companies before, with some differences concentrated on information-sharing levels.

The next section is dedicated to the analysis of performance indicators for Italian respondents with Brazilian partners.

5.1.2.7 Performance indicators

Before beginning with this part of the analysis, it is important to remember the three dimensions considered in this section: delivery, inventory costs and price, return.

Delivery

The descriptive statistics for "Delivery" are displayed in Table 22.

	Player	Mean	Std. Deviation	Variation Coeff.
Delivery time	Supplier	3.67	0.82	22.3%
	Client	3.00	0.63	21.1%
	Total	**3.33**	**0.78**	**23.4%**
Delivery time variability	Supplier	3.67	0.52	14.1%
	Client	2.83	0.98	34.7%
	Total	**3.25**	**0.87**	**26.6%**
On-time deliveries	Supplier	4.17	0.75	18.1%
	Client	3.50	0.84	23.9%
	Total	**3.83**	**0.83**	**21.8%**

Table 22- Descriptive statistics for "Delivery"- Italy with Brazilian partners

The overall results for "Delivery" are quite similar to the one for Brazilian respondents, with decrease for all three variables. Once again, there are divergences regarding Italians and Brazilians' perceptions of the performance indicators related in the table. Some examples are given below.

a) Delivery time: Italian suppliers assess their performance when it comes to delivery time as 3.67 out of 5, while Brazilian clients consider their suppliers' performance worth of 3.43. At the same time, on the opposite way around, Brazilian suppliers evaluate themselves with 3.33, while their Italian clients consider their performance worth of 3.00;

b) Delivery time variability: the main point for this variable, using the same rationale above, is the big difference between Italian clients and Brazilian suppliers' perceptions. While the first has given an average grade of 2.83, the later has assessed the performance worth of 3.44. This is a reasonable misalignment between the players and can seriously jeopardize the success of the whole partnership. Italian clients keep high expectations regarding lead time variability, what is coherent with the industry tradition in Italy, a market consolidated in the top two tiers of niches presented before. Thresholds concerning delivery times variability need to be clearly defined so that the supplier's production process and the client's inventory levels can be dimensioned in a more efficient and effective way;

c) On-time delivery: as a result of delivery time variability expectations misalignment, there is a reasonable divergence in this variable as well. Italian clients consider that, out of 5 deliveries, 3.5 are on time. At the same time, for Brazilian suppliers, this number equals 4.22. Therefore, there is a serious expectation divergence that needs to be aligned between the parties so that the service level required by Italian clients can be reached by Brazilian suppliers.

Inventory costs

The descriptive statistics for this dimension are provided in Table 23.

	Player	Mean	Std. Deviation	Variation Coeff.
Advantages in purchase prices	Supplier	3.00	0.63	21.1%
	Client	3.33	0.52	15.5%
	Total	**3.17**	**0.58**	**18.2%**
Inventory management advantage	Supplier	2.33	0.82	35.0%
	Client	2.50	0.55	21.9%
	Total	**2.42**	**0.67**	**27.7%**
Product development efficiency	Supplier	3.33	0.82	24.5%
	Client	2.50	0.84	33.5%
	Total	**2.92**	**0.90**	**30.9%**

Table 23- Descriptive statistics for "Inventory and production costs"- Italy with Brazilian partners

The main conclusions for this variable are quoted and explained below.

a) Advantages in purchase prices: the results from both segments are aligned and have a good level of development. It is still possible to evolve in this variable and profit from order consolidation initiatives through, for example, decrease of the suppliers base. A roadmap to tackle this issue has already been proposed and, therefore, it will not be repeated in this section;

b) Inventory management advantage: this is the main issue and bottleneck for Italian-Brazilian partnerships considered in this survey. The statistics show this clearly, with low averages, ranging from 2 to 3. The results are aligned between the previous analysis and this one. Therefore, the roadmap proposed previously also applies here and it is imperative that at least some short-term initiatives be put in place in order to improve inventory efficiency in these partnerships. These inefficiencies affect both Italian and Brazilian clients, given that both countries have consolidated and big niches for basic products, which rely on competitive prices in order to succeed in the market. However, these prices are not dependent just upon the company's internal activities anymore, as now the trend is that SC's compete with each other. Given these circumstances, it is essential that interfaces between players be efficient, through adequate information-sharing initiatives and dimensioning of inventory according to the player's lead time and demand consumption and variability. These high levels of inventory in the SC are a burden that needs to be overcome in order for these partnerships to be more competitive in the Italian and Brazilian markets.
c) Product development efficiency: this variable relates to the easiness of the partnership to modify products, customize and provide more effective results to final customers and the downstream segments of the SC. This dimension is extremely important for the top two tiers of the apparel industry pyramid, given that the demand in these niches require better levels of customization and lower lead times. Therefore, the lack of expectation alignment regarding delivery time variability and on-time deliveries proportion hinders the efficiency the partnership has to develop or modify products. Besides that, given the low levels of mutual development and collaboration, more engagement in integration initiatives should be pursued before this indicator gets more competitive in a responsive and dynamic market environment.

Given that the bottlenecks for this analysis proved to be the same for the previous ones and the responses are aligned in general, the roadmaps proposed before are also applicable here and, therefore, will not be elaborated again.

5.2 Average correlation coefficients

The last analysis of this report takes into account all the data obtained with the 53 responses this survey had. Basically, the intention is to understand how, in general, SC integration and the performance indicators inspired by the SCOR framework can be related. In order to do this, the Spearman correlation coefficient was once again calculated for every possible combination between the 17 SC integration dimensions related to the SC 4C's model and the nine performance indicators present in the questionnaire. This analysis was already conducted in the last sections in order to assess the specific relations in the Italian-Brazilian partnerships. Here, however, this distinction will not be made, so that it is possible to evaluate the phenomenon as a whole.

The first step, thus, was the calculation of the average correlation coefficient for each of the performance indicators, along with the variation coefficient related to each one of them. It is very important to highlight that the average values are not supposed to be very high, given that there are SC integration dimensions that do not correlate directly to some of the performance indicators. On the other hand, the calculation of these averages may show the overall effect each one of the indicators may suffer when SC integration practices are put in place in a given partnership. These values are shown in Figure 29.

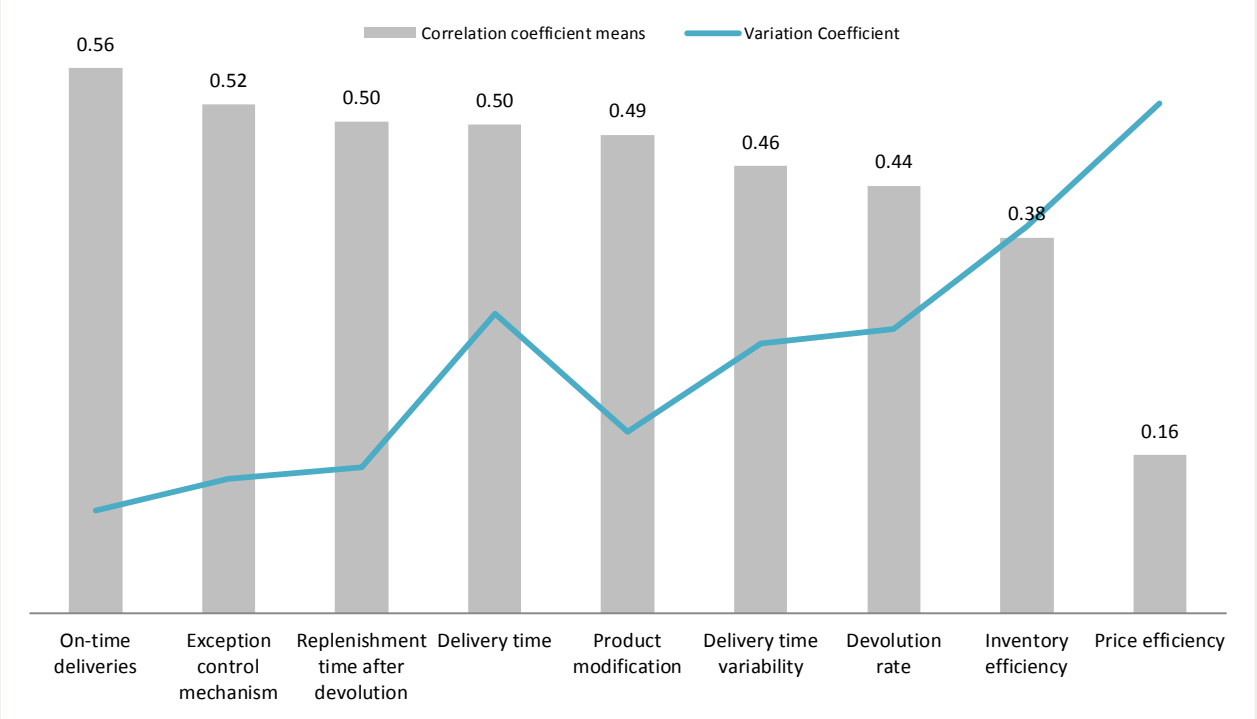

Figure 29- Average correlation coefficients for all performance indicators

Indeed, as commented before, it is possible to notice that the average correlations are not so close to 1, which would show perfect correlation events. However, many of them are in the

upper 0.5 range, which already shows, according to Table 8, a substantial positive correlation between SC integration and the performance indicators.

The basic and most important conclusion that can be taken considering this graph is that, indeed, SC integration is positively correlated to a company's performance indicators and, therefore, as has been broadly approached along the literature review, even if there are risks and costs associated with the enhancement of the integration process, the final results in terms of cost-savings and service level are likely to compensate the drawbacks in the medium term.

The next analysis is another way to restate and confirm the conclusion quoted above. Basically, instead of calculating the average correlation coefficients for the performance indicators, the calculations will be made for all the 17 SC integration dimensions defined in the literary review, according to the SC 4C's model. The results are shown in Figure 30.

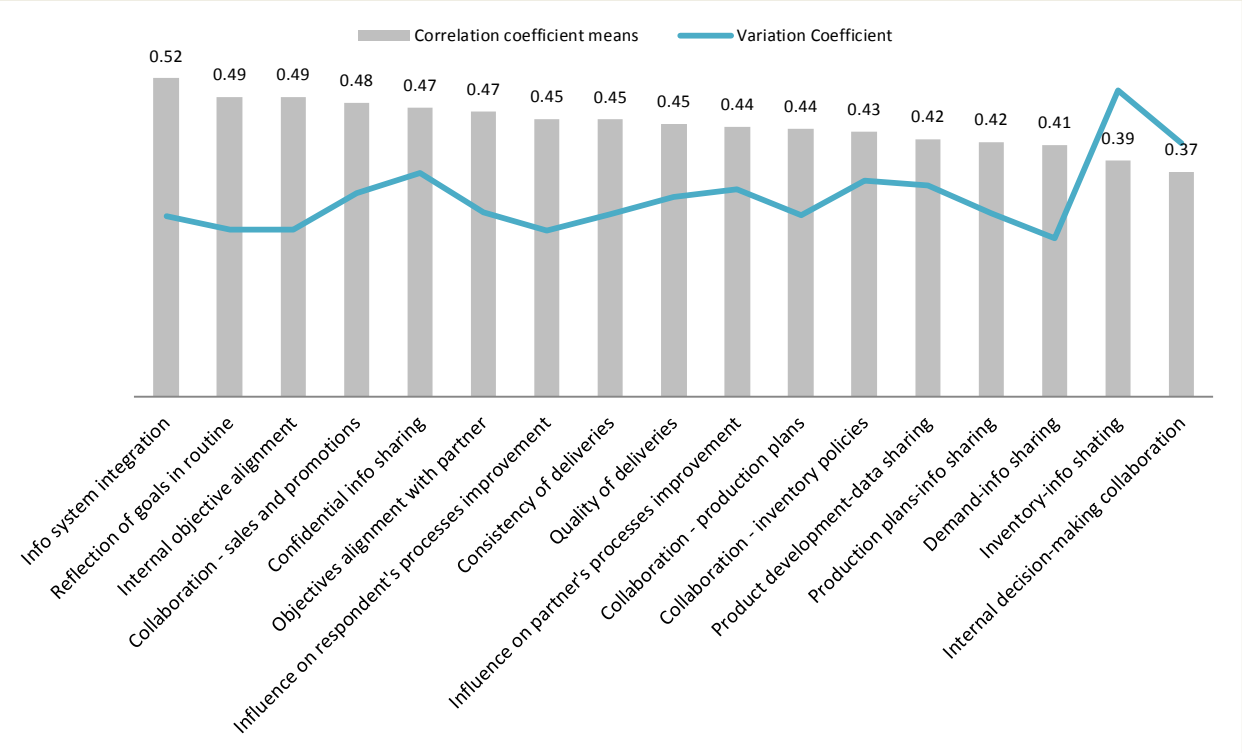

Figure 30- Average correlation coefficients for all SC integration dimensions

Analyzing the graph above, a similar statement can be made. Basically, even if the correlation coefficients are not so close to perfect correlation, given that they are averages, the overall effect that each of these SC integration dimensions have on the performance indicators is definitely expressive. The implementation of information systems that enable information sharing and real-time monitoring tools, for example, is substantially correlated with the performance of a given company and so on for the other dimensions in the graph above.

Therefore, once again, it is possible to see that SC integration is, in general, substantially correlated with the company's performance in a positive way, considering the responses obtained with the survey developed in this project.

These conclusions show what the industry has already considered as a strategic move towards differentiation: investing in the company's internal processes, proposed by the Porter Value Chain model, is not enough anymore for the maintenance of competitive advantage. It is essential for organizations to align goals with partners and invest in inter-organizational interfaces in order to provide the intended value proposition to the customer.

5.2.1 General comparison between Brazil and Italy

In this last section, a brief comparison between Brazil and Italy will be conducted using all the data obtained with the survey, including the respondents who stated that do not maintain commercial relations with the complementary country, In order to do that, the dimensions of the SC 4C's model will be used once again, along with the performance indicators tackled in the questionnaire.

The averages and variation coefficients for both Italian and Brazilian respondents can be seen in Figure 31.

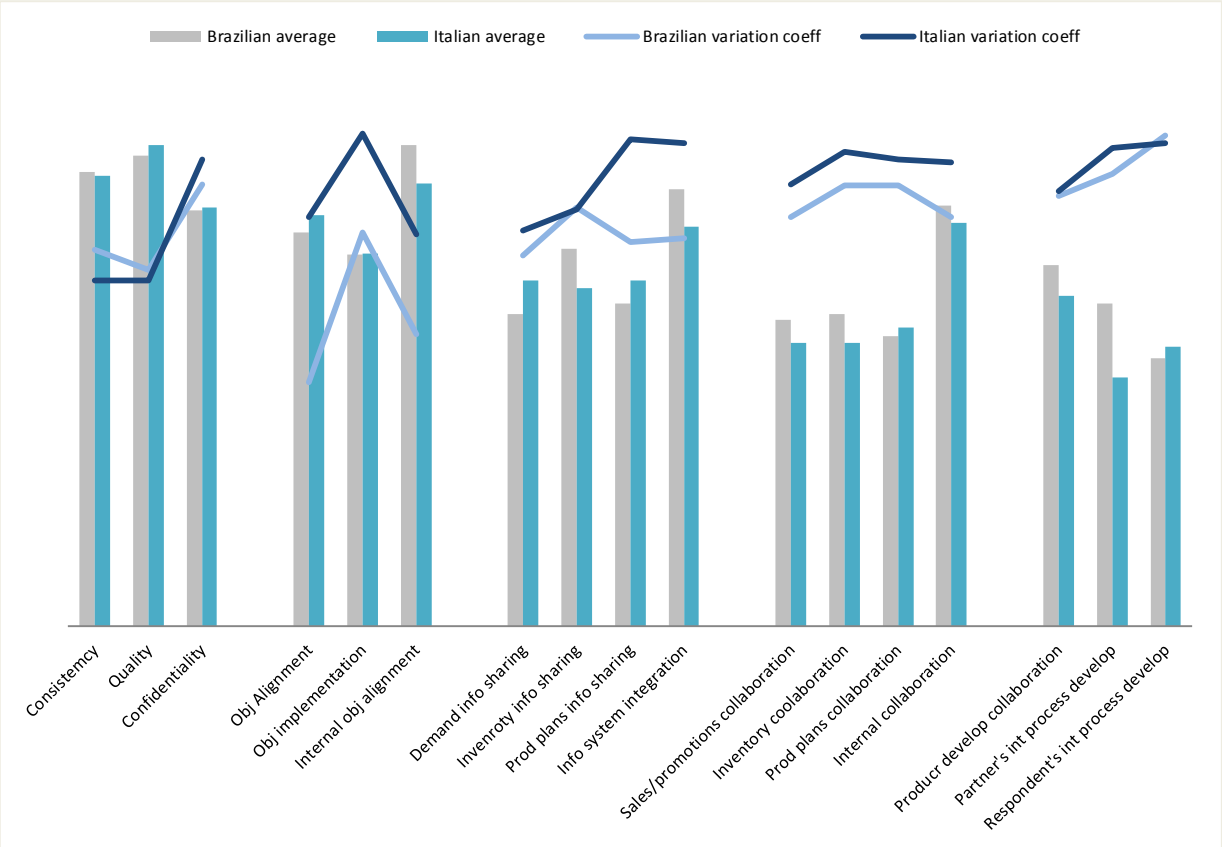

Figure 31- Comparison between Brazil and Italy - SC Integration

As can be seen in the graphs above, the averages are aligned, with small differences in one dimension or the other, generally in favor of Brazilian respondents, but not at a significant level. On the other hand, Italian variation coefficients are basically always higher than Brazilian ones, with some punctual exceptions, such as for consistency of deliveries and demand-related information sharing.

Therefore, the main conclusion here is that, among respondents, Brazilian partnerships present a more homogeneous level of SC integration in all five dimensions, while the averages are not significantly different between the two segments.

It is interesting to highlight that the variables related to internal alignment of objectives and shared decision-making process have considerably higher averages, especially in the “goal congruence” section, represented by the second cluster of graphs in Figure 31. Therefore, companies in the sample assess their SC internal integration as a positive point, both among Brazilian and Italian companies. This comes along with high averages for information system integration, which acts as one of main the enabling factors to internal sharing and alignment of objectives. Therefore, in order to improve integration as a whole, the key activity is to invest in control mechanisms regarding the goals implementation in real life. Once this is done, other integration levers tend to develop organically, as was approached before in this report.

The last analysis of this section concerns the comparison of performance indicators between Italian and Brazilian players involved in the survey. The graphs showing the differences between the two segments can be seen in Figure 32.

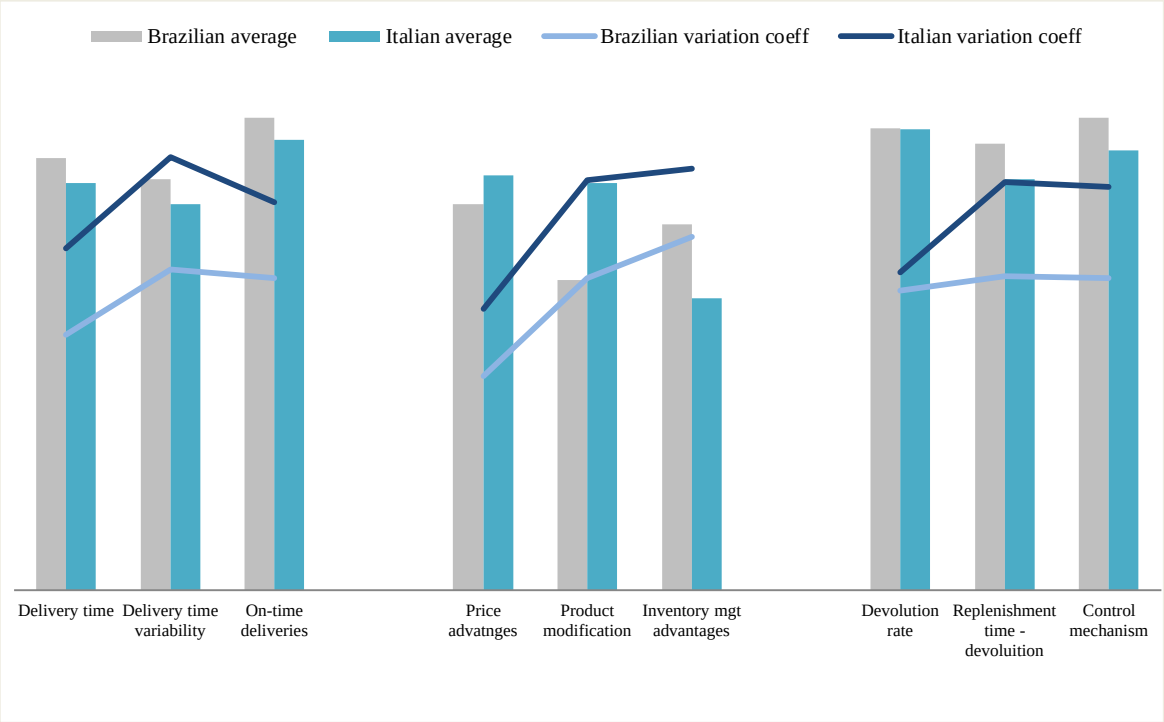

Figure 32- Comparison between Brazil and Italy - Performance indicators

Also here it is possible to notice that averages are aligned, while variation coefficients differ from each other according to the same trend analyzed before. It actually makes sense for the variation for Italian respondents to be higher than the Brazilian ones, given that SC integration dimensions also showed to be more heterogeneously dispersed for the Italian segment.

Considering the whole set of responses obtained in this survey provides conclusions coherent to the ones explained when taking into account only the players with commercial relations with the complementary country, but there are some differences. For example, the main contrast seen above refers to the service level the SC provides; according to the "product modification" dimension, Italian respondents have more developed SC's in terms of possibility of customization and flexibility, which actually is coherent with the Italian apparel market and industry, very much based on high-end segments, with higher demand variability and lower order volumes. This makes it essential for SC's to adapt products fast according to the different demand patterns and requirements.

Therefore, according to the respondents, Brazilian apparel SC's tend to be more cost-driven, while Italian ones, service-oriented and, thus, should focus primarily on demand-related and inventory-related information sharing, respectively.

6 Conclusions

A wide range of analyses has been conducted throughout this project, including theoretical frameworks assessment, definition of the main issues to be approached in the questionnaire and, finally, the empirical analysis of the responses so that the importance of SC integration practices on performance indicators could be understood and interpreted given the context of the apparel industry.

The main conclusion obtained with this project is the restatement of how SC integration can affect a company's competitiveness, be it in Brazil or in Italy. In order to remember how these analyses were done in this report, a brief storyline will be presented below, highlighting the most important considerations and conclusions.

a) One of the main bottlenecks for the enhancement of SC integration in all segments considered in this project is the relatively low level of goodwill trust, which hinders deeper coordination and collaboration practices;
b) Information related to inventory, demand patterns and production plans is already shared in Brazilian-Italian partnerships, but key data still needs to be continuously exchanged in a more consistent way;
c) Reliability and competency forms of trust are already consolidated in the partnerships and, therefore, are incentives for companies to engage in closer and win-win commercial relations;
d) There is a significant level of goal alignment between partners, but there is a serious bottleneck in the implementation of these goals. Very often, the goals aligned by companies at the beginning of the partnership are not present on the daily activities of respondents;
e) Collaboration levels are still incipient both among Italian and Brazilian respondents, which is basically a result of the low level of goodwill trust and implementation of goals in the partnerships;
f) The main inefficiency for Brazilian and Italian players that are engaged in partnership among themselves is the lack of inventory-related advantages provided by the commercial relations. In order to tackle this issue, the correlation coefficients have shown that the most important initiatives are investment in information-sharing infrastructure, inventory-related information sharing and establishment of control mechanisms to make sure partnership goals get implemented on a daily basis;

g) There is also inefficiency when it comes to order consolidation, considering that the apparel industry is highly fragmented and suppliers can be easily replaced by competitors;
h) There are some perception asymmetries between Brazilian and Italian players, which may come from differences in the partnerships` relevance of lack of expectation alignment at the beginning of the partnership (creation of a joint business plan, according to the CPFR model). The main variables for these asymmetries are consistency and quality of the deliveries;
i) On average, all dimensions of the SC 4C's model are positively correlated with the company's performance indicators, what indicates that, in fact, SC integration is a strategic investment, given that partnerships with Italian/ Brazilian companies are considered strategic by respondents;
j) Considering all the responses in the sample, it was possible to notice that Italian respondents' SC's are more effective than Brazilian ones, whilst the latter tend to be more efficient in terms of costs, especially when it comes to inventory management. This is coherent with the market structure for the apparel industry in each of the two countries.

As has already been vastly discussed in the literature, SC integration initiatives enhance companies' performances and this was also true for the survey developed in this project. Both Brazilian and Italian companies inserted in the apparel industry could become much more competitive and differentiate themselves from the large number of small and fragmented competitors in the market by engaging in closer relations with partners. This can be done, basically, through the enhancement of trust in the other party and straightforward goals so that both companies know exactly what the partner's interests are and which the objectives of the partnership should be.

In order to proceed with the study conducted in this project, it would be interesting to collect larger samples, so that the statistical significance of the premises adopted in this report could be adequately tested. The main elements to be addressed by this continuation are the correlation coefficients calculated in this report. With larger samples, it is possible to test the correlation between every single variable of both models and define whether they are statistically representative or not through a t-student test, for example, given that the responses distribution can be approximated by a normal curve.

Another variation of this study could be to test the SCOR framework in its five macro-processes with no consolidation of information, as was done here. By conducting this study,

performance indicators would be more split and, therefore, the analysis could involve a higher level of detailing in terms of the relation between SC integration dimensions and performance indicators.

Finally, the last variation of this study proposed in this section is the usage of a difference reference model for SC integration, focusing, for example, on CPFR dimensions or even the CSCF model, which have been presented in the literature review part of this report. This could bring new variables to the table and add value to the work that has already been done regarding the understanding of which elements are related to SC integration and what effects they can have on companies' performance indicators.

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