Adoption of Quick Response and inventory management in fast fashion: two case studies in the state of Minas Gerais

Adoção de Resposta Rápida e gerenciamento de estoques no fast fashion: dois estudos de caso em Minas Gerais

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Abstract: The business model adopted by a company must be aligned with definition of the operational strategies that provide agility and flexibility needed for supplies, production, and distribution. Quick Response (QR) is a growing operational strategy in industries, and is intended to reduce the time spent in production stages, so that products can be developed a few weeks prior to the sales period. QR is particularly relevant to a business strategy called fast fashion, which requires high inventory turnover ratio, regular insertion of new products on points of sale, supply chain agility (SCA), and assertiveness in identifying trends. The purpose of this study is to identify how this strategy can become operational via QR and inventory management in two case studies conducted in the apparel industry in the state of Minas Gerais, Brazil. This study adopted a qualitative approach with direct documentation as a research technique - the case study method. Results showed that one of the assessed companies operates according to the fast fashion strategy, whereas the other, due to lack of QR application and little efficiency in inventory management, was not successful in adopting this business strategy.

Keywords: Inventory; Quick Response; Fast fashion; Apparel industry.

Resumo: *O modelo de negócio adotado por uma empresa deve ser alinhado à definição de estratégias operacionais, que concedam agilidade e flexibilidade necessárias aos suprimentos, à produção e à distribuição. A Resposta Rápida (Quick Response - QR) é uma estratégia operacional em crescimento nas indústrias e sua finalidade é reduzir o tempo despendido nas etapas de produção, para que seja possível desenvolver os produtos poucas semanas antes do período de venda. A QR é especialmente relevante para a estratégia de negócio denominada fast fashion, que exige giro de estoque elevado, inserção frequente de novos produtos nos pontos de venda, agilidade na cadeia de suprimentos (CS) e assertividade na identificação de tendências. O objetivo do artigo é identificar como essa estratégia pode ser operacionalizada via QR e gestão de estoques em dois estudos de caso na indústria de vestuário em Minas Gerais. O estudo adotou uma abordagem qualitativa, com documentação direta como técnica de pesquisa, o método de estudo de caso. Foi observado que uma empresa atua de acordo com a estratégia fast fashion, enquanto a outra – devido à falta de aplicação da QR e pouca eficiência na gestão dos estoques – não obteve sucesso na adoção dessa estratégia de negócios.*

Palavras-chave: *Estoques; Resposta Rápida; Fast fashion; Indústria de vestuário.*

1 Introduction

The apparel industry's goal in the 21st century is to reduce the time spent in production processes and logistics activities, which leads to the minimization of supply, development, production and distribution cycles, made possible by Quick Response - QR (Cachon & Swinney, 2009). These goals are met in a market where the fast fashion strategy is used, despite the movements of slow fashion, resulted from consumer awareness (Gabrielli et al., 2013; Pookulangara & Shephard, 2013).

Companies in many industries have faced supply problems, which can be due to multiple causes (accidents, disasters, strikes, quality problems and machine breakdowns). In practice, source

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diversification and demand (and price) management are two strategies that have been used to address this problem (Gong et al., 2014). Demand management (and consequently, supply management) leads to the application of QR, which, according to Cachon & Swinney (2011), seeks to manage inventories more efficiently, allowing a better fit between supply and demand for certain products.

QR emphasizes flexibility and speed in delivery, to meet the continuous changes of a dynamic, volatile and highly competitive market. It is a well-established strategy; widely used in the apparel industry and aims to improve inventory management through lead time reduction (Choi, 2013).

In retail, one can segment the causes of this lack of inventories (rupture) into three large groups: problems on planning, order processing and replacement (Aguiar & Sampaio, 2013).

QR intensification, coupled with the search for higher inventory turnovers and the development of products with highly updated fashion trends, resulted in the emergence of a strategy called fast fashion. This strategy is based on four fundamental aspects: an agile process of production and distribution; the frequent insertion of new products in the market; a high inventory turnover; and assertiveness in the identification of trends (Foroohar, 2006; Passariello, 2008; Caro & Martínez-de-Albéniz, 2010; Li et al., 2014).

The purpose of the article is to identify how this strategy can become operational via QR and inventory management in two case studies of the apparel industry in Minas Gerais. The article is divided into six parts. First, there is a contextualization of the themes; then, on topic two, the theoretical review will be presented; on topic three, there is the presentation of the research method; the fourth stage has as its main axis the results; and finally, the conclusions of the research and bibliographic references are presented.

2 Inventory management, Quick Response and fast fashion

2.1 Inventory management and Quick Response (QR)

According to Cui et al. (2011) and Muller (2011), inventory management is a relevant activity for the success of a company and enables the regulation of inventory levels to guarantee customer satisfaction without compromising assets with excessive volumes of inventory.

One of the main problems related to inventory management is when and how much to ask to ensure the desired levels of availability. These issues, along with competition between firms, have led organizations to develop strategies focused on

improving the decision-making process regarding orders and inventories (Fisher et al., 2001; Lowson, 2002; Serel, 2012). To assist in this management, an inventory control model must be chosen so that the classification of items according to their stage in the life cycle directs managers to choose between the models (Rego & Mesquita, 2011).

According to Fleischhacker & Fok (2015, p. 1182), the need to start production before the sales season leads to two strategies for overcoming the uncertainty inherent in forecasting demand: to produce more, to bid; to use QR where short lead time allows additional production to start as demand becomes more clear. In the first strategy, one is looking for sufficient supply to start the season and a conciliation between supply and demand. Under the QR strategy, production is performed more accurately for an expected demand.

The QR operating systems are the result of aspects related to cost, lead time and quality, but one aspect is fundamental for the characterization of QR: agility. This is the enabling aspect of this operational strategy and is related to the ability of a company to make organizational, logistic, production and information procedures efficiently operational. Figure 1 summarizes the model:

QR is associated with a highly volatile demand, a long resupply time, and a product with a short life cycle (Choi & Sethi, 2010). The industries that have most used QR as an operational strategy in the last two decades are retail companies of electronic artifacts, toys, household linens and footwear (Christopher & Towill, 2001; Choi et al., 2010).

Choi & Sethi (2010) argue the cost of investing in QR is high, making it necessary to implement information technologies (ITs) focused on integrating internal and external information to the company, such as Enterprise Resource Planning (ERP); leading companies to make partnerships, using other tools such as *Collaborative Planning, Forecasting and Replenishment* (CPFR) and *Vendor Managed Inventory* (VMI), which make inventory management more agile (Choi & Chow, 2008). Krishnan et al. (2010) respond to the benefits of QR in retail, saying it can cause serious problems for retailers. For inventories of SC's first links, that is, upstream the chain, QR can compromise incentives for retailers to intensify the sales effort of an industrialized product for the benefit of a rival product. The performance of each link within a chain is fundamental to its overall performance (Mazzillo & Anzanello, 2015). The culture of Brazilian companies in their various sectors leads to concrete and objectives results, which should directly reflect the good performance of companies, suppliers or customers within the context of the supply chain (Borella et al., 2017).
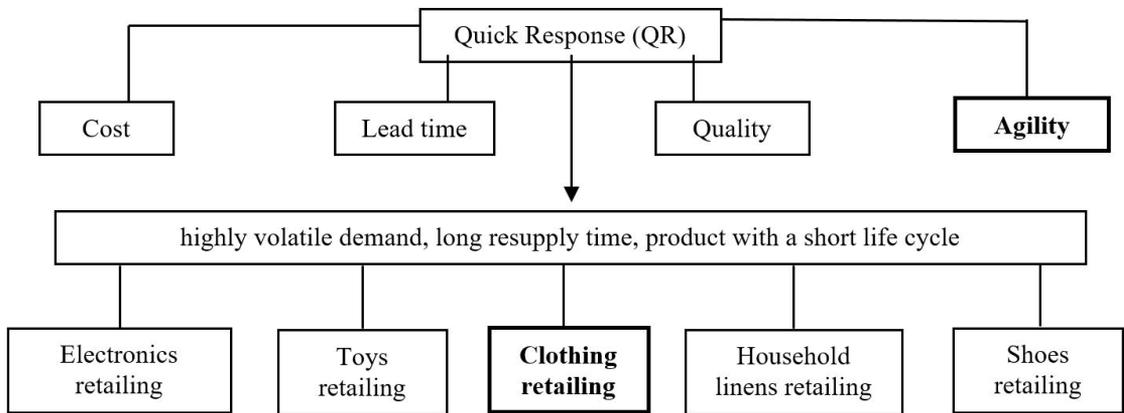
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                    ┌─────────────────────┐
                    │  Quick Response (QR) │
                    └─────────────────────┘
    ┌────────┐      ┌───────────┐     ┌──────────┐     ┌──────────┐
    │  Cost  │      │ Lead time │     │ Quality  │     │ Agility  │
    └────────┘      └───────────┘     └──────────┘     └──────────┘

  ┌────────────────────────────────────────────────────────────────────┐
  │ highly volatile demand, long resupply time, product with a short    │
  │ life cycle                                                          │
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  │ Electronics│  │  Toys    │  │ Clothing │  │Household │  │  Shoes   │
  │  retailing │  │ retailing│  │ retailing│  │ linens   │  │ retailing│
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Figure 1. QR - outline scheme. Source: Prepared by the authors.

2.2 Fast fashion

Gabrielli et al. (2013) summed up consumption in a fast fashion market in four aspects: experience, in which cognitive and emotional aspects are mixed; integration, when the individual assumes their place in the world; player, the moment they interact with other individuals, who identify themselves with the brand used, for example; and classification in society, in which one has patterns of behavior appropriate for clothing. Thus, one observes how complex it is to produce a commodity that has several functions for one same consumer in a volatile market such as the clothing retail one.

Li et al. (2014) argue that lead time should be reduced, as with the volatility of fashion trends, unavailability of clothing products is inevitable. However, the impact of the lack of fast fashion products is different from "conventional" products. For the latter, the lack of products is considered an indelicacy by consumers and, consequently, there is loss of sales. On the other hand, regarding fast fashion products, their lack creates a fanatic behavior from consumers to own them - a behavior considered intelligent by those buying -, generating a boost in consumption by retailers.

According to Choi et al. (2014), aligning the forecast of demand for each Stocking Keep Unit (SKU) in each store is a difficult task due to changes in consumer preferences, product information failure; very low demand forecast (0.45 units); lost sales - which may be high due to reduced unit inventory - prices reduced by companies to increase sales; seasonality; weather-related contingencies; competitors' actions. These production characteristics at a fast fashion pace drive companies to a constant challenge to produce. Some authors propose statistical models to forecast demand allowing to conciliate supply and demand, though there are restrictions to their application.

In this article, this theme will not be addressed as it does not belong to the proposed objective.

2.3 Quick Response and fast fashion in the apparel industry

Among different competitive factors relevant to the development of clothing companies, agility has gained importance for organizations due to the need for businesses adaptation and the ability to respond to fashion trends in a short period of time (Tyler et al., 2006; Choi et al., 2010).

In the first decade of the 21st century, QR has influenced the clothing industry intensively and has been configured as a logistics and production challenge. The movements focused on the productive efficiency, the reduction of production and delivery's lead time have contributed to improved responsiveness of companies. This industry has been going through changes such as the addition of new distribution channels, scarcity of resources, climate and demographic changes, new technologies and changes in the global economy, impacting both retailers and their customers (Pookulangara & Shephard, 2013). The adaptation of organizations to technological advances in global terms, driven by competitiveness, culminated in different ways of generating value, as well as the value generated (Merino et al., 2015).

According to Bianchi & Birtwistle (2012), changes in consumers' behavior and in clothing industry are aligned and are one of the causes of the use of QR in companies' inventory management. The apparel industry's response to the changes in the market and to the search for products with up-to-date fashion information was the fast fashion strategy. According to Cachon & Swinney (2011), two aspects are fundamental for the definition of a system of fast fashion: quickness of production and distribution; and insertion of products with up-to-date fashion

information. The operationalization of these two aspects may be a problem for the organizations, due to the complexity involved in the maturation of production processes.

However, for Choi et al. (2010), the correct adoption of fast fashion in Brazil needs to have a logistic planning that goes all the way from product design to its availability in POSs. The main factors to be analyzed to verify a logistic system made operational according to fast fashion are: collections per year (releases), product's life cycle, speed in information processing, logistic lead time, response time, type of production, type of distribution. For the same authors, in Brazil fast fashion influences all logistics procedures of an organization that adopts it as a business strategy. The main factors to be analyzed to verify a logistic system made operational according to fast fashion are: number of collections per year; product's life cycle; speed in information processing; logistic lead time; response time; type of production; and type of distribution. In the relationship between QR and retail, this strategy helps the industry - which is based on constantly updated demand information - to reduce inventory management costs (Serel, 2012). Now, to unite the retail industry, the SC's producer link must adopt an appropriate production system to reduce lead time and use up-to-date demand information (Zhang et al., 2013). In general, QR refers to a strategy that seeks to improve the response time from the selection of an item in a retailer to its replacement by the industry (Choi et al., 2013).

After the bibliographic review above, a conclusion may be that QR and fast fashion have their critical points. In relation to QR, these points are: market sensitivity, information sharing, integration of production processes and relationship with suppliers. Now the fast fashion strategy has as critical points for its adoption: assertiveness in identifying trends, productive agility, frequent insertion of products in points of sale, and high inventory turnover.

The apparel and textile sector is characterized by a short product life cycle, high volatility, low forecasting and high levels of impulse buying. This last aspect is related to cost reduction and its impact on consumer behavior. These consumers are migrating from high-cost, sophisticated products to classic products that are not too sought and consumed (Bruce & Daly, 2011).

From 1960 on, some industries started to look for new productive alternatives, more efficient and with greater chances of reaching the target audience through a more agile production in comparison to the traditional organizations, to guarantee the commercialization of articles with more updated fashion information (Cietta, 2010). For the same author, this industry was considered for decades by the other productive sectors as an inefficient and slow industry (lead time

up to 300 days), due to the following factors: high time, failed information management, intensive work force and a complex SC. In this article, only the first two aspects will be developed. The first aspect is related to production cycles in the apparel industry, known for having a very high lead time and difficulty in managing production. This has contributed to delays in the delivery of products to POSs for many decades (Bruno & Maldonado, 2005).

About the failed information management factor, Cachon & Swinney (2011) affirm that this industry's SC is quite long and counts on different sectors, which don't always act in an integrated way, causing a complexity in the chain. The SC extension can lead to a greater difficulty of communication between the agents acting on each stage of production. The lack of integration is directly related to information management failures.

3 Research method

An extensive list of studies was published intending to present and problematize the concepts of fast fashion and QR in the Northern Hemisphere (Ghemawat & Nueno, 2003; Ferdows et al., 2004; Foroohar, 2006; Gumbel, 2009; Silva et al., 2011) and present relevant contributions to the study of this strategy. However, they have focused on the global performance of the organizations analyzed. These studies may not represent the strategic and operational reality of specific markets.

For literature review, a search was conducted in Scopus for articles, using the terms in 'title, abstract, keyword': 'QR AND inventory'; 'inventory management AND fast fashion'; 'fast fashion AND demand forecast'; and 'inventory AND QR AND fast fashion AND apparel'. The areas were delimited into: 'Business, Management and Accounting'; 'Decision Science'; and 'Economics, Econometrics and Finance'. Moreover, articles from 2013 to 2017 were selected from Scielo. In these searches, no studies on the subject ('QR AND apparel', 'fast fashion AND apparel') were found in Brazil.

This study has a qualitative approach (Pope & Mays, 2005; Bryman, 1989; Lakatos & Marconi, 2008) and this study was guided by the following characteristics of the said approach, which served as research stages: identification and analysis of organizational actions pointed out by representatives of companies; understanding of the context and reasons for conducting the actions analyzed; description of the processes related to the actions analyzed; use of the necessary research methods; minimum previous structure.

Regarding the sample, this study had a non-probabilistic sample due to convenience, selected from contacts with professionals in the apparel sector (Money et al., 2005). Two companies of this sector were analyzed in

the city of Belo Horizonte and surroundings (state of Minas Gerais), which operate according to the fast fashion strategy.

For data collection, the technique adopted to reach the proposed objectives was intensive direct observation, due to its flexibility for data collection. The research's instrument adopted was the semi-structured interview, based on a script of open and closed questions. Easy access to the representatives of the selected organizations in the sample contributed to the choice of this technique. Chart 1 presents the themes discussed in the article from the literature review, which helped to structure the questionnaire:

This article has as a research method the study of multiple and integrated cases, which allows one to analyze different aspects in each case. The choice for

this type of method was influenced by the need to understand how the topics of research, fast fashion, QR and inventory management are related in different companies. Data analysis of this study was conducted according to Bardin (2010), observing its levels of analysis.

4 Results and discussions

4.1 Case study 1: company A

The general data for company A are shown on Chart 2. According to the interviewee, the company's production manager, the organization has two outsourced factions located near the factory and one supplier located 200 km away. The company also uses some factions located within a radius of 50 km,

Chart 1. Indicators for questionnaire elaboration, its themes in literature review and authors.

Indicator	Theme	Authors
Time of operation	General Questions	-
Organizational structure		
Monthly production		
Focus of action		
Inventory management	Inventory management	Cui et al. (2011); Muller (2011); Fisher et al. (2001) Lowson (2002); Serel (2012); Lin & Parlaktürk (2012); Choi & Chow (2008); Krishnan et al. (2010); Aguiar & Sampaio (2013); Mazzillo & Anzanello (2015); Borella et al. (2017)
Inventory control model	Inventory management	Rego & Mesquita (2011)
Product development	Inventory management Quick Response (QR) Fast fashion	Serel (2012); Zhang et al. (2013); Cachon & Swinney (2011)
Development lead time		Fleischhacker & Fok (2015)
Production lead time		Christopher & Towill (2001); Choi et al. (2010, 2014); Li et al. (2014); Cachon & Swinney (2011); Zhang et al. (2013); Bruno & Maldonado (2005); Cietta (2010); Cachon & Swinney (2011)
Response Time		Tyler et al. (2006); Choi et al. (2010, 2013); Cachon & Swinney (2011); Cietta (2010)
Products life cycle		Cachon & Swinney (2011); Bruce & Daly (2011)
Repricing	Case study	Case study
Trend research	QR and Fast fashion in the apparel industry	Foroohar (2006); Passariello (2008); Caro & Martínez-de-Albéniz (2010); Li et al. (2014); Tyler et al. (2006); Choi et al. (2010)
Sales history		Choi et al. (2014).
Management system		Choi & Sethi (2010)
Number of collections		Choi et al. (2010)
Number of releases		Choi et al. (2010)
Definition of a target audience		Cietta (2010)
Number of customers	General Questions	-

Source: Prepared by the authors.

Chart 2. Comparison between company A and company B.

Indicator	Company A	Company B
Time of operation	22 years	21 years
Organizational structure	200 employees	88 employees
Monthly production	30,000 pieces	8,000 pieces
Focus of action	Jeans and casual wear	Party, casual and resort wear
Inventory management	Focus on the separation of raw materials and finished products	Focus on the separation of raw materials and finished products
Inventory control model	Two periods without demand update in the period of sale	Two periods without demand update in the period of sale
Product development	Particularly before the period of sale	Before and during the period of sale
Development lead time	30 days	15 to 45 days
Production lead time	85 days	35 days
Response Time	115 days	50 to 80 days
Products life cycle	30 days	20 days
Repricing	Special sale at the end of each period of sale and a bazaar near the factory with the remaining pieces.	Mini special sales throughout each period of sale and at the end of it. Retailing of discontinued pieces in the outlet store after one year
Trend research	Specialized websites and blogs, fashion weeks, trade magazines and trips to other countries	Specialized websites and blogs, fashion weeks, trade magazines and trips to other countries
Sales history	Used for definition of collection's scope	Used to define the collection scope for inventory reallocation
Management system	ERP	MRP
Number of collections	2 collections	2 collections
Number of releases	6 releases: 3 in the winter and 3 in the summer	7 releases: 3 in the winter and 4 in the summer
Definition of a target audience	Target audience still in the definition stage	High clarity regarding the target audience
Number of customers	800	750

Source: Prepared by the authors.

responsible for 20% of production. The distribution structure of the company is composed of an immediate delivery system, or wholesale, which distributes its pieces through two showrooms, i.e., venues destined to customer service, located in the cities of Belo Horizonte and São Paulo.

Inventories are managed based on an ERP system, which allows the monitoring of the production flow. The only exception is the back-up inventory, which is not counted in the system. According to the interviewee, the company is concerned about the unavailability of products at the point of sale.

Product development is carried out well in advance of the marketing period. This is due to the high production lead time of about 85 days. The development lead time is 30 days. This allows the company to develop products in advance. The strategy adopted to offer items with updated fashion trends is related to an enhanced use of fabrics. The fact that jeans washing is a process done after the pieces are made allows washing patterns to be changed according to the trends, even if the piece is in the final stages of production.

Market sensitivity is achieved through surveys in websites, blogs and magazines, as well as two annual trips to confirm the trends of each season. From a collection planning, production is scheduled in weekly releases and, after approval of the prototype group, the pilot pieces are released for production.

Information management has as its main IT the ERP system, adopted throughout the organization. The system is not integrated with partners but generates e-mails with purchase orders to suppliers. The style, development, and production schedules are aligned to create the collection's schedule. Besides the use of ERP, the company has, in its showrooms, tablets with a three-dimensional catalog of the pieces.

Regarding fast fashion, the company seeks to present a mix of products in line with fashion trends; structures its production in two main collections (summer and winter) and each is divided into three releases. The goal is to increase the return of customers to the showrooms, focusing on the brand's strengthening. The production planning is organized in two collections. A challenge the company faces is to conduct a very assertive planning in the development

sector, so that the entire product set arrives at the showroom at the same time; and in an agile way, for products are also offered later in POSs.

Company A presents aspects related to fast fashion, such as vertical integration, delay in the washing of pieces and search for efficiency in the productive sectors. However, the company presents divergent factors of this market strategy. A very high lead time and searching for high anticipation can compromise the agility that fast fashion requires. It is relevant to analyze the strategies of the company to understand how fast fashion is embedded in the organization.

4.2 Case study 2: company B

According to the interviewee, director of creation of the organization, the company has a structure centralized in the cutting, finishing and shipping stages. The manufacturing stages are carried out by small factions located in the metropolitan area of Belo Horizonte. The distribution structure of the company is based on the system of immediate delivery and is carried out mainly through three showrooms: one located in Belo Horizonte and two located in São Paulo; and directly through a store of their own - in which the current collection is sold - and an outlet store - for discontinued items. The company uses a MRP system to assist in its inventory management, which allows to verify in which stage the production is located and helps in the control of resources employed in the production flow. The support inventory is not integrated into the company's MRP system and is managed apart. Raw materials inventory is managed on a weekly basis, and is mainly related to the inclusion of raw materials delivered by the suppliers in the IS. In-process inventory is managed through releases called cut orders and production orders. Finished products inventories are managed based on the segmentation of inventory items, according to their profitability and turnover. Although there is no policy directed at the replacement of finished product inventories, the company conducts timely replacements, according to the degree of customer response.

The stages related to product development are carried out well in advance according to the marketing period. Among the factors that contribute to the need to order in advance are: slowness in the SC and lead time, considered high by the interviewee. The development lead time varies depending on the approval of prototypes. References with an agile approval present a 15-day development lead time, while references requiring adjustments to the prototype may present a development lead time of up to 45 days.

Company B adopts strategies for the identification of market sensitivity: surveys on websites, blogs and magazines, in addition to two annual trips abroad to confirm consumption trends. Based on what will be produced, the product development process starts, in which, from a planning of references to be sent to production, the development sector structures the design of models.

The company's information management has as main IT the MRP system adopted in the organization. According to the interviewee, the company is considering the adoption of an ERP system, but there is concern that the robustness of an ERP will damage the information flow in a small company. However, the system adopted is limited and does not allow integrated planning in the company. The company also adopts an IT to optimize the molds used in the cutting stage, which impact on the use of the fabrics, making it more efficient. It allows the structuring of cutting maps with minimal waste of fabrics.

Regarding fast fashion, company B has its focus on identifying trends and interpreting information for the niche of consumers of the brand. There is a quest for the presentation of a very complete product set, aligned with fashion trends.

Orientation to the fast fashion strategy has intensified in the last two years, when the calendar of releases was restructured. According to the interviewee, the company adopted, for 19 years, a calendar with two releases, one in each main collection. Currently, company B adopts a calendar with seven annual releases, four summer releases and three winter releases.

Company B presents operational aspects related to fast fashion, such as the reallocation of inventories, postponement of accessories choice and search for productive agility. The company also presents marketing aspects related to this strategy, such as the adoption of reduced grids, portfolio diversification and trends monitoring. The absence of a vertical integration and high lead time are difficult to the orientation of this strategy. It is important to align operational strategies with the market strategies to ensure that the organization keeps on as a fast fashion company.

4.3 Discussion: comparison between company A and company B

Based on the case studies of company A and company B, it is possible to compare the performance of each company according to the variables identified. Chart 2 summarizes the performance of each company analyzed, according to the indicators discussed in the literature review.

Chart 2 allows to verify similarities and particularities between the companies analyzed, and the main points will be commented. Despite the time of operation in the similar market, a larger growth curve can be verified in company A. This company has the productive advantage of working in the jeans wear segment, which has the characteristic of working with

production volume, which may have contributed to more expressive results, both in quantity produced and absolute growth over the last two decades.

The management of raw material inventories occurs in a similar way in the companies analyzed. The focus is the segmentation of items according to profitability and quantity of inventory available. However, it is possible to verify individual actions for each organization. Company A seeks earnings in purchases with economies of scale, while company B seeks earnings based on assertive purchases, which guarantee productive demand, but do not exceed the quantity required.

Regarding inventory policy, both companies seek high availability of raw materials and finished products. The main difference between both companies analyzed regarding this aspect is related to the destination of the finished product inventory. Company A stores the finished products on the production site and forwards them to the showroom as required by the distribution centers. Company B chooses to direct all finished products to showrooms. By adopting this strategy, company B guarantees availability and contributes to a better turnover at the distribution centers.

The inventory control model is closely related to the production period. Company A produces a significant part of the collection before the period of sale. This is related to a highly productive lead time and a low degree of QR. Company B presents a lean productive lead time, which contributes to the possibility of a higher QR grade. Lead time is a main aspect for a company to adopt the fast fashion strategy.

Company A did not clearly present its products life cycle but reported that a medium life cycle would be around 30 days. On company B, the life cycle is of 20 days. As for repricing, company B's strategy of marking down pieces with a lower inventory turnover contributes to its consistency with the fast fashion strategy, since products are not exposed for a long period of time.

Both company A and company B conduct similar researches on trends. Sales history and business information are used in company A particularly in the beginning of the planning of each collection and, in company B, in the beginning of the collection and throughout the period of sale. Company A adopts an ERP system to manage its activities, which is more advanced than the MRP system of company B.

Both companies structure their schedules based on two annual collections and divide these collections in releases. It is important to emphasize that the periods between releases count on pieces supplies periodically, without a specific strategy, although they contribute to the maintenance of fast fashion.

The target audience's clarity is one of the main differences between the companies analyzed. Company A is unclear regarding its niche market, while Company B has a high clarity of its target audience. The search for a high understanding of the target audience by all employees of the company contributes to the achievement of better results. The distribution channel adopted by the companies analyzed is predominantly indirect. Company A distributes its pieces exclusively through showrooms. Company B adopts shared distribution channels through the showroom and through its own store and outlet venue.

5 Conclusions

This paper presented the relationship between the fast fashion strategy, QR and inventory management. The case study made possible to envisage the success of the fast fashion business model, which requires an alignment between the business' strategies and operations ones. It should be noted that the operational strategy adopted in the main representatives of fast fashion in the world is QR. QR is related to the restructuring of the production process as a way of guaranteeing greater agility and flexibility. To make QR feasible, it is necessary to develop actions focused on developing the market, information, production processes and suppliers.

In inventory management, it is relevant to observe the actions related to policies, management and control of inventories. By linking fast fashion, QR and inventory management, one can verify the relevance of the alignment between the strategies of the business, operations and inventories. After the study of fast fashion, QR and inventory management, one sought to verify the alignment between the three concepts on each company of the sample.

QR is not adopted by company A whose response time is 115 days. In company B, QR is hampered by the delay in the development of some products. In situations where the development lead time is the shortest, of 15 days, the response time is around 50 days and is in accordance with the practice of fast fashion companies. The higher limit, with a development time of 45 days, contributes to a high response time, which compromises QR.

Company B has a higher productive agility, with a production lead time of 35 days, very close to the lead time practiced by representatives of fast fashion. Company B's production lead time is 85 days, which makes the company's production process quite slow. In contrast to the production lead time, the integration of processes is verified in a greater degree in company A. Both companies seek a more precise information management, using information technology, although company A uses more advanced IT than the company B.

The inventory turnover is higher in company B, as the products life cycle is 20 days, compared to the 30 days of company A. Company B seeks to keep the product's life cycle short and to reallocate pieces

according to the level of inventory on each showroom and conducts small special sales throughout the period of sale with low turnover pieces. Company A does not adopt any strategies to reduce the life cycle, which compromises fast fashion, as the same products remain exposed until the end of the collection.

The fast fashion strategy is most clearly verified in company B. Company A uses flexibility in processing finished products as a solution to ensure that the pieces are according with the fashion trends, but the lack of consumer-related policies allows for certain products to be exposed throughout the period of sale. Finally, low productive agility generally compromises the adoption of fast fashion.

Company B most effectively inserts fashion information into its product portfolio. This is because the segment in which it is inserted allows greater use of fashion trends. The adoption of seven releases and the production of reduced quantities of each reference contribute to a higher turnover. The daily insertion of products guarantees a more updated product set and productive agility contributes to the strategy being effectively adopted.

In the sample, the companies present faults in different aspects presented in the work, but it is relevant to analyze the critical points for the adoption of fast fashion: assertiveness in identifying trends, productive agility, frequent insertion of products at points of sale and inventory turnover.

Considering the analysis of company A regarding fashion trends, productive agility, frequency of products insertion in the point of sale and inventory turnover, it is possible to conclude that company A does not adopt the fast fashion strategy. Although company A seeks to be updated with fashion trends and supplies its showrooms quite regularly, the low productive agility and the inexistence of policies to increase inventory turnover make impossible to adopt fast fashion. The analysis of the same aspects in company B allows one to conclude that it adopts the strategy of fast fashion. It is possible to verify in this company the existence of productive agility like other fast fashion companies, as well as the daily insertion of articles in their showrooms, the search for a greater inventory turnover and the use of fashion information.

Thus, through the case studies carried out, it was possible to identify the panorama of fast fashion in two clothing companies of Minas Gerais. The adoption of fast fashion requires alignment between operational and business strategies in companies. Without the support of operations, the adoption of fast fashion becomes unfeasible, as the company becomes vulnerable to strategic consumers and less competitive in comparison with competitors with productive agility and high inventory turnover. This study reflects the Brazilian apparel industry, which has undergone a restructuring process since trade opening three decades ago: some companies already reach higher degrees of adaptation to the fast fashion strategy, while others still seek to develop critical factors for the adoption of the strategy.

Despite the complexity of the theme, which converges the production, logistics and marketing perspectives, it is possible to conclude that the purpose of the work was achieved. Subsequent works can qualitatively deepen the adoption of QR in one of the companies studied, as well as analyze QR and inventory management in clothing companies of the same segment. The quantitative approach can be performed by analyzing inventory turnover and response time in Brazilian fast fashion companies. The managerial contribution can be through corrections in production aspects by company A and improvements in information management by company B.

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