



# What makes demand management in the supply chain possible? A multiple-case study of critical success factors

*O que torna a gestão da demanda na cadeia de suprimentos possível? Um estudo multicase dos fatores críticos de sucesso*

Daniela de Castro Melo<sup>1</sup>  
Rosane Lúcia Chicarelli Alcântara<sup>2</sup>

**Abstract:** The objective of this study is to identify and analyze the critical success factors for improvement of demand management performance in the supply chain. This research adopted the multiple-case design, and the NVivo10 software was used to support content analysis. Forty interviews were conducted with senior executives of 27 companies including wholesalers, manufacturers, and retailers within the grocery sector. The following critical factors were identified: collaborative management (information sharing, planning and execution of joint actions, knowledge and resource sharing, and performance indicators), top management involvement, customer and supplier segmentation, information technology, and demand management adherence level. The results obtained can contribute to successful implementation of demand management process in the supply chain by providing a list of consolidated factors that can help professionals develop powerful strategies for effective demand management.

**Keywords:** Demand management; Supply chain management; Critical success factors.

**Resumo:** O objetivo deste artigo é identificar e analisar os fatores críticos de sucesso para a melhoria do desempenho do processo de gestão da demanda na cadeia de suprimentos. A pesquisa foi realizada por meio de múltiplos casos. Utilizou-se o software NVivo10 como apoio à análise de conteúdo dos dados. Foram realizadas 40 entrevistas com executivos de 27 empresas distribuídas em atacadistas, manufaturas e varejistas do setor de mercearia básica. A pesquisa possibilitou identificar os seguintes fatores críticos: gestão colaborativa (compartilhamento de informações, planejamento e execução de ações conjuntas, compartilhamento de recursos e conhecimento, indicadores de desempenho), envolvimento da alta gerência, segmentação de clientes e fornecedores, tecnologia da informação e nível de adesão à gestão da demanda. Os resultados da pesquisa podem auxiliar no sucesso da implementação do processo de gestão da demanda na cadeia de suprimentos, pois consolidam uma lista de fatores para que os profissionais possam concentrar seus esforços e desenvolver estratégias apropriadas para a melhor gestão da demanda.

**Palavras-chave:** Gestão da demanda; Gestão da cadeia de suprimentos; Fatores críticos de sucesso.

## 1 Introduction

Significant economic changes such as globalization have fostered market development, and thus companies have been urged to offer greater product variety, customization, and higher service levels. In this new context, demand management is a topic that emerges in the field of supply chain management and marketing seeking to balance and strategically align demand with operating capability across the supply chain through the rapid and successful integration of the market needs in the direction

of the suppliers. These changes have posed new challenges for organizations, requiring them to identify customer value perceptions and how they can be transformed into product offerings.

Melo & Alcântara (2011) and Santos & D'Antone (2014) classify demand management into two approaches: demand management as the integration of marketing and supply management and demand management as a process or component of the supply chain management.

<sup>1</sup> Departamento de Engenharia de Produção, Universidade Federal do Triângulo Mineiro – UFTM, Avenida Doutor Randolpho Borges Júnior, 1250, Univerdecidade, CEP 38064-200, Uberaba, MG, Brazil, e-mail: daniela\_c\_melo@yahoo.com.br

<sup>2</sup> Departamento de Engenharia de Produção, Universidade Federal de São Carlos – UFSCar, Rodovia Washington Luís, Km 235, CEP 13560-000, São Carlos, SP, Brazil, e-mail: rosane@dep.ufscar.br

According to Melo & Alcântara (2012), demand management, marketing management, supply management, and supply chain management operate together to build customer relationships, develop customer prioritization strategies, provide accurate information to consumers, and establish intra- and inter-firm relationships or joint actions to balance value requirements and operational capabilities. Therefore, in order to maximize shareholder value, integration, coordination, and management of processes and of supply chain and demand activities are necessary (Anning et al., 2013).

Through systematic literature review (Anning et al., 2013; Melo & Alcântara, 2011; Santos & D'Antone, 2014), it was found that there is little information to provide guidance on how to implement demand management in supply chains. Most studies available are focused on isolated demand management practices, such as demand forecasting, sales and operations planning (S&OP), collaborative planning, forecasting and replenishment (CPFR), and demand segmentation (Melo & Alcântara, 2011, 2012).

No research that focuses on supply chain agents and addresses the critical success factors to implement demand management across members of the supply chain was identified. Thus, empirical evidence of any positive impact of demand management on supply chain performance is scarce, and most studies available in the literature are theoretical (Bower, 2006; Milliken, 2008).

The objective of this study is to identify and analyze the critical success factors for improvement of demand management in the grocery supply chain including manufacturers, wholesalers, and retailers. Critical success factors are areas that should receive special attention from organizations to enhance the chances of successful implementation of the demand management process in the supply chain. Therefore, they enable companies to get organized and develop competences to reach demand management maturity to provide customers with better services and, with its proper implementation, improve profitability.

## **2 Demand management and its critical success factors**

Many authors (Anning et al., 2013; Chong & Zhou, 2014; Croxton et al., 2008; Hilletoft & Ericsson, 2007; Hilletoft et al., 2009; Juttner et al., 2007; Mentzer et al., 2007; Mentzer & Moon, 2005; Rainbird, 2004; Vollmann et al., 2004; Walters, 2006; Walters & Rainbird, 2004) assume that demand management involves creating synergies between operations and marketing management to better understand the market and develop actions

synchronized with the company strategies, production capacity, and final customer needs.

According to Esper et al. (2010), the demand and supply integration process begins with the recognition that the organization has a set of strategies and tactics related to the demand and supply management. Having access to this information, managers study the capabilities, constraints, and opportunities of the external environment to generate demand and supply information (Esper et al., 2010).

The next step is the generation and dissemination of knowledge of demand and supply processes through forecasting. Thus, the representatives of these processes and representatives external to the company can share knowledge. The last element of the structure proposed by Esper et al. (2010) is knowledge application, which takes the form of demand plans and operational plans.

According to Anning et al. (2013), the key elements for the integration between the demand processes and supply processes are good relationships, cooperation, and information sharing between the supply chain agents.

Croxton et al. (2008) argue that the demand management process requires the integration of strategic sub-processes (provide structure for how the process will be implemented), operational sub-processes (provide the detailed steps for implementation), and the other supply chain management processes (customer relationship management, customer service management, order fulfillment, manufacturing flow management, supplier relationship management, product development and commercialization; returns management).

Hilletoft et al. (2009) believe that there are three important issues that need to be properly addressed to successfully implement demand management: demand generation, demand fulfillment, and coordination of these two processes. Both marketing and supply chain management coordinate these processes according to market demands and require collaboration between the supply chain agents. Demand generation involves strategic marketing planning, marketing research, market segmentation, product development, product commercialization, marketing and sales, and product life cycle management. On the other hand, demand satisfaction consists of the strategic supply chain planning, the supply chain design, and the supply chain operations.

Juttner et al. (2007) proposed three integrative themes for demand management: process, configuration, and social interactions. Demand processes include all processes that involve the customers and the market aiming at meeting customer demand through value creation. Supply processes comprise the tasks necessary for fulfilling demand. Thus, Juttner et al. (2007)

highlight the need for managing the integration between demand and supply processes.

Configuration refers to the decisions on the number of customer segments that the company can serve with differentiated supply chains and also the structural aspect of a customer segment, i.e., the supply chain capabilities and processes required to satisfy each customer segment needs. Social interactions involve the information sharing between marketing and supplies (Juttner et al., 2007).

Melo & Alcântara (2015) propose the following dimensions to assess the demand management maturity in the supply chain: information sharing, planning and execution of joint actions, inter- and intra-company interactions; performance indicators, top management involvement, customer and supplier segmentation, and information technology. Each one of these dimensions represents a way by which companies can be structured to optimize profitability through improved efficiency and effectiveness of supply chains.

According to Mentzer & Moon (2005), demand management requires the coordination of marketing activities, demand planning, and demand forecasting management. Thus, demand management is a component of the supply chain management that encompasses the traditional functions of marketing and demand planning, which is the coordinated flow of derived and dependent demand across the companies in the supply chain. On the other hand, demand planning includes demand forecasting management which is concerned with the independent demand (Mentzer & Moon, 2005).

Rexhausen et al. (2012) point out that an effective demand management exerts a substantial and positive impact on the overall supply chain performance. The authors consider demand segmentation, demand forecasting, Sales and Operations Planning (S&OP), and level of adherence to demand management as dimensions of demand management.

Chart 1 summarizes the main critical factors for the successful implementation of the demand management process in the supply chain discussed by several authors.

Therefore, based on the literature review, it was possible to identify and consolidate the factors that help companies to successfully implement the demand management process in the supply chain: collaborative management (information sharing, planning and execution joint actions, resource and knowledge sharing, performance indicators), top management involvement, customer and supplier segmentation, information technology, and demand management adherence level. Each one of these factors will be discussed in the next topics.

### 2.1 Collaborative management

A collaborative supply chain involves two or more companies working together to plan and execute supply chain operations with greater success than when acting alone (Simatupang & Sridharan, 2002). Collaboration occurs when entities agree about the goals established and use their resources (information, people, and technology) to create synergies and achieve long term competitive advantage (Fawcett et al., 2008; Lejeune & Yakova, 2005).

**Chart 1.** Critical factors for implementation of the demand management process identified in the literature.

Critical factors for the successful implementation of the demand management process in the supply chain	Literature
Integration and coordination between demand processes and supply processes.	Anning et al. (2013) Esper et al. (2010)
Integration of strategic sub-processes and operational sub-processes with the supply chain management processes.	Croxtton et al. (2008)
Demand generation, demand fulfillment, and coordination of these two processes through collaboration.	Hilletoft et al. (2009)
Coordination among processes, configuration, and social interactions.	Juttner et al. (2007)
Information sharing, planning and execution of joint actions, inter- and intra-company interactions; performance indicators, top management involvement, customer and supplier segmentation, and information technology.	Melo & Alcântara (2015)
Coordination of marketing activities, demand planning, and demand forecasting management.	Mentzer & Moon (2005)
Demand segmentation, demand forecasting, Sales and Operations Planning (S&OP), and level of adherence to demand management.	Rexhausen et al. (2012)

Source: adapted from Anning et al. (2013), Esper et al. (2010), Croxtton et al. (2008), Hilletoft et al. (2009), Juttner et al. (2007), Melo & Alcântara (2015), Mentzer & Moon (2005), Rexhausen et al. (2012).

It was found that the collaborative practices between organizations that are critical factors for the demand management process in the supply chain are information sharing, planning and execution of joint actions, resource and knowledge sharing, and development of performance indicators (Chen et al., 2009; Fawcett et al., 2008; Holweg et al., 2005; Horvath, 2001; Mentzer et al., 2000; Min et al., 2005; Sabath & Fontanella, 2002; Simatupang & Sridharan, 2002; Stank et al., 2001; Vieira et al., 2009). These factors will be discussed in the next topics.

#### a) information sharing

A successful collaboration requires changes in the standard business practices, particularly regarding information exchange (Stank et al., 2001). Data exchange, operational plans, and financial information are necessary in order to reap the benefits of collaboration (Min et al., 2005). According to Mouritsen et al. (2003), information integration allows the visualization of customer demand, inventory, and production in the supply chain, supporting collaborative planning and forecasting.

Melo & Alcântara (2012) highlight the need for the sharing of strategic and operational information between supply chain partners, in addition to knowing each other's potential. This information enables the access to the strategic intent of partners, gaining greater knowledge about their objectives and goals.

Therefore, companies should share strategic and operational information to learn about their partners' difficulties and capabilities (Vieira et al., 2009) and generate demand and supply forecasting information (information about capacity, initiatives, supplier strategies, technology, industry trends, inventory levels, and transportation and storage options) (Esper et al., 2010). Moreover, having access to the partner's strategic intent, allows knowledge about growth objectives, market share, and improvement in the services offered (Min et al., 2005).

#### b) planning and execution of joint actions

The demand management process involves a cross-functional team composed of members from various levels and sectors of the organization, as well as strategic representatives of the supply chain (suppliers and customers) (Chen et al., 2009; Croxton et al., 2008; Hilletofth et al., 2009; Juttner et al., 2007; Mentzer et al., 2007; Vollmann et al., 2004). This cross-functional team should have a broad understanding of the market and the guidelines and strategic and operational practices of the organization (Croxton et al., 2008; Esper et al., 2010; Hilletofth et al., 2009; Mentzer et al., 2007).

Vieira et al. (2009) argue that there is higher level of collaboration when the participants are involved in joint actions. According to Min et al. (2005), one of the consequences of supply chain collaboration is that the improvement in the relationship between partners encourages the development of a joint business plan that will be implemented by the cross-functional teams of each company.

In the context of demand management, Mentzer et al. (2007) define "plan" as a set of specified managerial actions to be undertaken to meet or exceed the sales forecasts. Given economic and competitive conditions, and the marketing, sales, production, and logistics plans, a projection of future expected demand is made. From this base, the business plan is developed, and this process is iterative because if the resulting business is not aligned with the financial needs and goals of the company, you interact back to the sales forecast and change the production plan, sales, and inventory and examine what additional efforts can be made to meet the business plan. These measures ensure, therefore, a business plan based on the financial and market realities that the company is facing, its production and logistics capacity, and its supply chain (Mentzer et al., 2007).

#### c) resource and knowledge sharing

The development of a business plan generates commitment of the companies to invest financial resources in initiatives, sales campaigns, and promotional activities developed for the retailer and for the sales force. This plan provides companies with an estimation of the scope and depth of actions to be undertaken, and it also determines the time when they will occur, allowing for their preparation in advance to ensure budget allocation (Melo & Alcântara, 2012).

Companies can also share knowledge since they have different maturity levels in demand management (Melo & Alcântara, 2015).

#### d) performance indicators

The collaboration process should be formalized detailing the performance metrics (Min et al., 2005) that involve specific focus on costs, productivity, and earnings targets. In the demand management process, the cross-functional teams define the indicators framework to measure and monitor the process and the cross-functional teams develop an indicator framework to measure and monitor the process and set goals for performance improvement (Croxton et al., 2008).

Chart 2 shows the performance indicators in the demand management process in the supply chain.



**Chart 2.** Performance indicators in the demand management process in the supply chain.

- Retailer's sales performance, supplier's purchasing performance, gross margin, and market share;
- Value of inventory, average age of inventory, disruption, working capital, average time taken for the supplier to deliver goods versus the committed delivery date, and quantity of goods delivered versus the ordered quantity;
- Sales performance by category, distribution center, business segment, sales channel, Nielsen area;
- Number of retail stores that realized sales; and
- Quantity of items per order.

Source: Melo & Alcântara (2015).

## 2.2 Top management involvement

According to Min et al. (2005), internal alignment includes determining what needs to be done internally and what needs to be done by external partners. To ensure this alignment, the involvement of top management is necessary. The support of people with decision making power is important to ensure financial and non-financial investments. Furthermore, for the effective communication and information sharing between supply chain agents, the relationship between the top management teams is also necessary to enable identification of business opportunities and areas for improvement (Min et al., 2005). Another important factor is that the top management can facilitate the interaction between different areas and other businesses to encourage them to work together to develop and implement the business plan (Melo & Alcântara, 2012).

## 2.3 Customer and supplier segmentation

According to Lau (2012), demand management presupposes that the supply chain should be segmented according to market needs so that different strategies can be formulated to optimize efficiency and agility. Hilletofth (2010) highlights that in order to achieve successful implementation of supply chain management, among other factors, the organization needs to have advanced and intelligent market segmentation.

Melo & Alcântara (2015) found that companies with high level of demand management maturity had customer and supplier segmentation, achieving results that led to improved efficiency and effectiveness.

## 2.4 Information Technology

Another critical factor for the improvement of demand management performance is information technology support. Hilletofth (2010) states that information technology is a prerequisite to be used in the demand process management and supply process management separately. However, the author believes that this resource can also be useful for

coordinating these processes with each other, both inside and outside of the organization.

There are various types of information systems for demand and supply management; however, they are rarely integrated. Therefore, information technology is still seen as a barrier or problem in integrating supply and demand, and thus it needs further attention and investigation (Hilletofth, 2010).

Al-Mudimigh et al. (2004) emphasize that the integration of demand management and supply management is essential, and that creating an integrated environment based on information technology is a challenge. Thus, companies must ensure their information technology is constantly improved and optimized to provide real-time knowledge of production processes, consumer demands, and activities of the various sub-processes that are crucial to the supply chain principles.

Some authors (Hilletofth, 2010; Lau, 2012) argue that information technology should provide data in real time. Melo & Alcântara (2015) found that the companies in the supply chain with advanced information technology were able to share information in real time with internal and external teams, and they could also create a scorecard to assess demand management performance.

## 2.5 Demand management adherence level

Rexhausen et al. (2012) argue that the implementation of demand segmentation, demand forecasting, and S&OP may not be sufficient for a company to achieve superior demand management performance. These authors highlight that the level of adherence to demand management processes (or well-defined and implemented and meticulously carried out processes) plays an important role in the development of superior capabilities in companies that are interested in implementing or improving the demand management process. They found that the level of adherence is directly related to the improvement of demand and supply chain management performance.

Therefore, it requires that companies understand the different types of customer needs and product

requirements (service levels) in order to define and implement service standards in accordance with the previously issued guidelines (Hall & Johnson, 2009; Rexhausen et al., 2012).

### 3 Research methodology

The case study approach was adopted in this research. According to Yin (2005, p. 32),

[...] a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

Yin (2005) highlights that case studies seem to be the preferred approach when: 1) the research questions are the “how” or “why”; 2) the researcher has little control over events; 3) the focus is a contemporary event within some real context; 4) it is important to have multiple sources of evidence.

The focus of this research is on “how” the demand management process takes place between the members of the supply chain. This understanding will enable the identification of the critical factors to ensure the efficiency and effectiveness of the demand management process between the companies studied.

In addition, the researchers have no control over the event because real situations were studied and it was necessary to use multiple sources of evidence due to the complexity of the phenomenon under study: reports and documents provided by the companies, press releases, and direct observations and interviews. Thus, case study is the appropriate approach for this research.

A semi-structured interview was conducted and an interview guide was developed based on the systematic literature review (Melo & Alcântara, 2011; Santos & D’Antone, 2014) and some empirical studies (Melo & Alcântara, 2012, 2015; Rexhausen et al., 2012)

in order to identify the degree of sophistication of demand management in the companies studied, as well as the best practices and common themes of these practices. The interview guide was divided into topics, as shown in Chart 3.

The use of the semi-structured interview guide enabled asking additional questions probing clarification of certain issues or helping to keep the interview focused on the intended topics, especially when the respondents lost focus or had difficulty in expressing their opinions.

Senior executives of the following supply chain links were interviewed:

- **Manufacturers:** 13 large national and multinational companies that manufacture food, beverages, toiletries and beauty products, and cleaning products; these companies supply these items to the wholesale companies studied.
- **Wholesalers:** 4 major national wholesale companies located in the city of Uberlândia (MG); one of them is the national leader in the industry.
- **Retailers:** 10 small and medium-sized supermarkets belonging or that belonged to the supermarket chains *Smart*, *Valor*, and *Biz*, in the Brazilian cities Uberlândia (MG), Patos de Minas (MG), and Franca (SP). These three intercompany chains belong to three wholesalers studied, which grant the owners of the retail stores the license to carry their brand (Smart, Value, and Biz).

Chart 4 shows the job titles and functions of the respondents in each supply chain link. This studied included 27 companies totaling 40 interviews.

**Chart 3.** Issues discussed in the interviews.

Interview guide topics	Topic items
Company information and function/job title of the respondent	Location, size/revenue; market segment, and function/job title of the senior executive.
Demand planning	Areas and duties or responsibilities involved, data source used, sales forecast methods, intra- and inter-company interactions, top management involvement, information sharing, and information technology used.
Execution of the plan developed	Performance indicators, follow-up meetings, top management involvement, intra- and inter-company interactions, sales representatives/retailer training, inventory management, and information technology used.
Customer and supplier segmentation	Relationship with customers and/or suppliers.
Difficulties identified in the process	Problems and difficulties encountered with the use of the demand management process.

Source: field research.

**Chart 4.** Companies studied and the senior executives interviewed.

Companies studied	Number of companies	Number of interviews	Respondent job title
Manufacturers	13	17	Trade Marketing Manager Sales Manager Key Account Manager Demand Planning Director Trade Marketing & Merchandising Director Sales Director
Wholesalers	4	13	Purchasing Manager Logistics Planning Manager Procurement Manager Trade Marketing Manager President
Retailers	10	10	General Manager Owner
Total	27	40	

Source: field research.

**Chart 5.** Structure of the wholesale companies studied.

Wholesaler	Number of items	Business segments	Area of operations	Does it have intercompany chain?	Sales Team
Wholesaler 1	16,000	Pharmacy, electronics and information technology, food, beverages, school and office supplies, toiletry and beauty products, cleaning products, housewares, building materials, and veterinary materials	Nationwide (all Brazilian States)	Yes	5,000 ISRs 975 sales staff members Telemarketing
Wholesaler 2	8,000	Food, beverages, school supplies, toiletry and beauty products, cleaning products, housewares, agricultural and hardware, and camping leisure products	9 Brazilian States (MG, ES, SP, RJ, BA, SE, GO, TO, PR) and DF	Yes	380 ISRs
Wholesaler 3	3,000	Pharmacy, food, beverages, toiletry and beauty products, cleaning products, housewares	9 Brazilian States (MG, ES, SP, RJ, BA, SE, GO, TO, PR)	No	500 ISRs Telemarketing
Wholesaler 4	2,800	Food, beverages, school and office supplies, toiletry and beauty products, and housewares	12 Brazilian States (MG, ES, SP, RJ, BA, MA, PI, PE, PA, AM, AP, GO) and DF	Yes	540 ISRs

ISRs: independent sales representatives. Source: field research.

Chart 5 presents the structure the wholesale companies involved in this study.

The field research was divided into two parts. The first one was carried out between February 2011 and March 2013 and aimed to investigate the demand management process between manufacturers and wholesalers within the grocery sector. The second part was carried out between February 2014 and December 2014 and aimed at data validation and to

expand the results obtained in the first part, as well as to include the retailer link in the study.

The criteria for choosing the wholesaler participants included easy access to researchers and their location because the city of Uberlândia (MG) is the host of large grocery wholesalers. Five wholesale companies were invited to participate in this study, and four agreed to participate. In order to identify among them those that adopted the demand management

process and to determine whether the interview guide adequately represented their reality, their Trade Marketing and Purchasing managers were contacted and invited to participate in the study.

After the first interviews, it was found that Trade Marketing and Purchasing are the areas that are directly involved in the demand management process in the wholesale companies studied. Thus, representatives of these areas were interviewed in the four wholesale companies. The areas of Sales and Logistics were not directly involved in the planning of demand management activities, but they are affected by decisions related to the plans approved or implemented and are responsible for monitoring the performance indicators. Therefore, the areas chosen for the interviews in the wholesale companies studied were Trade Marketing, Purchasing, Sales, and Logistics.

During the interviews in the wholesale companies, the senior executives were asked to identify the manufacturers that best carried out the demand management activities with the wholesale companies and their respective point of contact. Therefore, interviews were conducted with representatives of Sales and/or Trade Marketing of these manufacturing companies because these areas are directly involved with the demand management process with the wholesale companies. During the interviews conducted in the manufacturing companies, some senior executives named other representatives of their companies that could contribute to the study. The researchers grasped the opportunity and interviewed these other representatives; therefore, some manufacturing companies have more than one participant.

Following the interviews with wholesalers and manufacturers and based on criteria such as easy access and connection with the wholesalers through the intercompany chains, fifteen supermarkets in the Brazilian cities Uberlândia (MG), Patos de Minas (MG), and Franca (SP) were selected to participate in this study. These retailers were contacted, and interviews were conducted with the general managers or owners of ten supermarkets. Therefore, all companies studied relate to each other and are members to the same supply chain.

The interviews were audio-recorded and transcribed for further analysis. The researchers recorded all accounts of informal dialogues with the respondents (before and after the interviews) and observations as field notes in a field notebook. The average length of the interviews was 1 1/2 hours.

The manufacturing companies studied are established in São Paulo (SP), a Brazilian city, but their sales and trade marketing representatives (sales director, sales manager, key account manager, and

trade marketing manager) make regular visits to their wholesaler clients. Thus, of the 17 interviews conducted in the manufacturing companies, only two were held in São Paulo, one with the Demand Planning Director and the other with the Trade Marketing & Merchandising Director. The other interviews conducted with the manufacturing companies were held in Uberlândia (Minas Gerais), in the wholesale companies 1 and 3.

All interviews with the wholesalers and retailers were held inside the company premises. Therefore, direct observation took place during the visits to the distribution centers of the wholesale companies in Uberlândia (MG) and to the supply area of wholesaler 1, in which the inventory resupply information system was closely examined. In the wholesale companies, the researchers (interviewers) were invited to have coffee with the respondents before or after the interviews; thus, they had the opportunity to observe the routine operations of suppliers and their relationship and interaction with the wholesale companies' employees.

In the retail companies, they could observe aspects related to the store environment such as organization, lighting, product assortment, and quantity of goods displayed.

Some reports and documents provided by companies (especially the wholesalers and manufacturers) were analyzed and they were related to: Joint Business Planning, organizational structure, logistics network, scorecards used to measure the performance indicators, and presentations of undergoing projects, for example, new distribution centers, customer segmentation, and the process of recruiting and selecting new salespeople. Therefore, the multiple data source used ensured validity and reliability to the research.

Data were subjected to content analysis, which, according to Bauer (2002), consists of the analysis of textual data in order to observe differences, compare, and categorize factors in the text through information processing. The content analysis approach proposed by King (1998) involves the researcher producing a list of themes (denominated "template") that is divided into categories according to which the textual data (interview transcripts, direct notes, field observations, etc.) will be coded and classified. Some of the themes considered to be included in the "template" are previously defined but can be changed and added to it as the investigator reads and interprets the data.

As recommended by King (1998), a version of the "template" was produced for the analysis of the interviews, according to the literature reviewed. The pre-established categories are:



- Collaborative management (information sharing, planning and execution of joint actions, knowledge and resource sharing, performance indicators);
- Top management involvement;
- Customer and supplier segmentation;
- Information Technology;
- Demand management adherence level.

The interviews transcripts were individually imported into the NVivo10 computer software as documentary sources. This software enables the encoding of texts and information management to support data analysis; the transcriptions of interviews are divided into segments, which are then encoded discriminating the coding instances.

The analysis of the 40 interviews enabled the encoding of 1,161 references that could be classified into the categories shown in Chart 6.

Finally, e-mail messages were exchanged with some of the respondents, and phone calls were made to clarify some issues that were not clear during data analysis.

The next section reports and discusses the results obtained.

## 4 Results

Content analysis enabled grouping the results into the critical success factors to implement the demand management process in the supply chain, according to the studies reviewed: collaborative management (information sharing, planning and execution of joint actions, knowledge and resource sharing, performance indicators), top management involvement, customer and supplier segmentation, information technology, and demand management adherence level, which will be discussed separately.

## 4.1 Collaborative management

### 4.1.1 Information sharing

#### 4.1.1.1 Intra-company – wholesaler and manufacturer

Information sharing occurs, on different levels, in the dyadic relationship between wholesaler and manufacturer. Only one of the four wholesalers studied discloses online information to the manufacturers. This information include stock position (per distribution center), sales (daily, weekly, monthly), and pending orders. One of the wholesaler respondents stated that the company discloses weekly information regarding sales and distribution per state and per sales channel to the manufacturers.

Most manufacturers pay the wholesalers to obtain the information they need. A wholesaler respondent said: *“we have information, but we do not disclose it to everyone, only to those who give us something in return”*.

A manufacturer respondent mentioned that they exchange information with the wholesaler regarding sales performance, market status, profit margins for the wholesale, and the manufacturers’ market participation.

#### 4.1.1.2 Intra-company - wholesaler and retailer

Most retailer stores studied share information regarding sales with the wholesalers upon their request, but only two of them discuss their sales goals with the wholesalers. One retailer respondent highlighted: *“Each supplier has its own company goal; they bring me their goal and forecasting, but they have never asked about mine.”*

Three retailer respondents said they share information in meetings held periodically with the supermarkets that are members of the chain and representatives of wholesale purchasing center.

Chart 6. Analysis categories.

Categories		References
Collaborative management	Information sharing	145
	Planning and execution of joint actions	394
	Knowledge and resource sharing	71
	Performance indicators	112
Top management involvement		109
Customer and supplier segmentation		145
Information technology		96
Demand management adherence level		89
Total number of codes		1,161

Source: data analysis.

During these meetings, in addition to sharing sales information, they share information regarding prices, sales campaign performance, knowledge, and experience.

#### 4.1.1.3 Intercompany

In the wholesalers, the business plan is usually developed by the trade marketing and purchasing areas, which discuss it with the sales area and the board of directors. The sales and logistics areas receive the business plan only after it is approved.

The manufacturers often use research and surveys to find out information regarding market share and the prices of their products and competitors' prices.

The results obtained indicate the need for changes in practices related to information sharing, as reported by Stank et al. (2001). It was found that for most of the agents investigated, information sharing occurs in dyadic relationships, particularly between wholesalers and manufacturers. Furthermore, information sharing between wholesalers and retailers occurs only when the retailer is part of a supermarket chain whose purchasing center belongs to the wholesaler. Without exchange of data, operational plans, and financial information the supply chain agents cannot fully reap the benefits of collaborating with each other (Min et al., 2005). Strategic and operational information enables acquiring knowledge about partners' difficulties and potentials (Vieira et al., 2009), demand and supply forecasting (Esper et al., 2010), growth objectives, market share, and improvements in the services offered (Min et al., 2005).

#### 4.1.2 Planning and execution of joint actions

It involves inter- and intra-company interactions. It was found that the trade marketing area in the wholesalers 1 and 3 develops the business plan together with the purchasing area; the plan is then submitted for the approval of their board of directors before being introduced to the manufacturers. There is no internal interactions for the development of the business plan in the wholesalers 2 and 4; the plan is developed by the marketing area, which submits it for the approval of the board of directors.

In the manufacturers, analyses are conducted to find out the sales channels, regions, and business segments with higher rate of growth in terms of the categories and sub-categories, and the goals for the upcoming year are set for each sales channel; they may or may not prioritize the wholesaler. Therefore, the manufacturer sales manager receives the goals for each client, as well as the company's

initiatives and investments in order to ensure they are accomplished.

In the intercompany interactions, wholesalers 1 and 3 also stood out in terms of planning and executing joint actions with the manufacturers. The wholesaler 1 selected 24 manufacturers with which they conducted a significant amount of business to develop a joint annual business plan. In addition, it defined 20 categories containing major sales areas to prioritize the development of business plans with the manufacturers within these categories. A wholesaler senior executive said:

*Where I sell toothpaste, I can sell toothbrush, dental floss, and mouthwash because they are part of a solution, of a category. This change in operation is a cultural change in wholesale. This means a drastic change in the paradigms for the sales teams. Are you used to selling only powder laundry detergent or tomato paste? No, I will start supplying a whole category.*

As for the other manufacturers, the purchase orders from the wholesaler 1 are automatically processed by the company; there is no relationship with the wholesaler buyer. During the development of the business plan, the companies discuss the sales campaign actions, the need for investments, and return on investment. The objective of the business plan is to increase the sales volume and the number of stores that sell the products. Therefore, the wholesaler conducts a business review in October to analyze the categories and regions where it stood out and those that need improvement. The companies gather together and the manufacturer presents its strategic objectives. Next, the categories, regions, and the trade marketing plan are aligned to support the plan.

The wholesaler 3 develops an annual business plan with 10 manufacturers and assesses them annually to determine who will remain partners. In November, after setting the budget for the coming year, the trade marketing and purchasing areas of the wholesaler 3 start formulating the proposals to be presented to the manufacturers. After discussing the business plan with the manufacturers and aligning their interests, the companies come up with a single plan and start implementing it. The plan outlines the operational areas, the products that will be developed, and the goals that are set by state and product category.

The respondents of the manufacturing companies pointed out that the actions carried out by the wholesaler 1 are more structured, but the company does not offer them flexibility to change these actions or to propose new ones. Therefore, due to the size of the company and its national distribution capacity, the legitimate power of the wholesaler 3 was observed, as described by French & Raven

(1959), since it establishes rules that must be obeyed by the manufacturers. On the other hand, this wholesaler allows greater flexibility as it involves the manufacturers in the decisions regarding the campaigns they will launch.

A respondent of the manufacturer stated that the meeting held between his company and the wholesaler 1 to present the business plan is somewhat formal and usually involves the board of directors and the president. After this meeting, the manufacturer assesses the feasibility of the proposal and verifies whether it is aligned with the company's strategy and the allocated budget. The companies then meet again three or four more times to make the necessary adjustments and put forward a single proposal.

A manufacturer respondent said: *"We usually agree on, let's say, 90% of what the customer wants"*. The companies discuss the proposals and many times the manufacturers cannot make the investment as required, then they come to an agreement with wholesalers on the actions to be taken. Another senior executive of the manufacturing company said:

*We can achieve this here, that's why we are suspending this campaign, but we will launch others. Look, last year we trained your whole team, and this year we will only include the training of trainers? Only the managers and supervisors?.*

It was observed that when investing in the wholesale channel, the strategic objective of the manufacturers is to improve the distribution of its products.

Together with the manufacturers, wholesalers 1 and 3 monitor the implementation and effectiveness of the business plan weekly to evaluate the marketing campaign results, investigate areas for improvement, and assess the financial costs and economic returns. Additionally, they discuss future campaigns, the orders to be processed by the wholesaler, issues related to the delivery of products to the wholesaler, inventory disruptions, sales staff training needs, difficulties in closing sales with retailers due to product price, and competitor activities.

The manufacturer respondents mentioned that they remunerate the wholesalers based on performance, i.e., on the achievement of the business plan goals. A manufacturer senior executive stated: *"I will only pay you if you reach 90% and then I will pay proportionally; I will pay proportionally up to 100%. I can pay a little more if you exceed this goal"*.

It was found that the wholesalers 1 and 3 and the manufacturers chose by them adopt the demand management process proposed by Melo & Alcântara (2012), which consists of three steps: 1) joint alignment of the of the company strategic guidelines; 2) business plan development, and 3) implementation and monitoring of the business plan. The development

of the business plan includes the definition of actions and investments, performance indicators, contingency plan, business plan approval, and monitoring and evaluation plan. On the other hand, the implementation and monitoring of the business plan include the development of sales forecast, joint performance measurement, visits to retail stores, joint problem solving, and redirecting the business plan when necessary (Melo & Alcântara, 2012).

It was also observed that the sales area of the wholesalers 1, 2, and 3 is involved only during the implementation of the business plan. Thus, the representatives of wholesaler sales area interact with the retail stores to implement the business plan activities. The lack of involvement of the sales area during the development of the business plan can hinder the communication with the sales team and the development of the point of sale (Melo & Alcântara, 2012).

The retail stores exhibited an opportunistic behavior since all of them buy their products from the supplier that offers the lowest price and consider that the sale price is a decisive factor in attracting consumers.

According to Morgan & Hunt (1994), opportunistic behavior means that one of the members involved in the relationship pursues its own interest and benefits. Such behavior, however, affects trust because pursuing own advantage violates their partnership agreement. The retailers studied achieve effective implementation of the business plan when there is mutual trust and better communication between the companies.

Wholesaler 2 develops the business plan with the manufacturers, but there is not a strong interaction and close involvement of the manufacturers in the planning. The wholesaler presents the business plan to the manufacturers requiring investments for the implementation of its actions. The manufacturers analyze the proposals and decide the extent of their participation based on the budget allocated to meet that specific customer. Follow-up meetings are held monthly to discuss the plan.

It was observed that the interactions between the wholesalers and the retailers are transactional since the negotiation with the wholesalers is over pricing. The transactional relationship is based on short-term relationship and competitive offer (Parker & Hartley, 1997), which focus mainly on achieving cost reductions or maintaining profit margins, often at the expense of the other party (Soonhong & Mentzer, 2000; Webster, 1992). Therefore, economic factors become a priority, and the potential to influence price determination or other commercial aspects tends to dominate the relationship. On the other hand, the partnership approach fosters innovation and

enables the sharing of risks and rewards resulting in long-term relationships (Meehan & Wright, 2011).

Wholesaler 4 does not develop the business plan with the manufacturers, and since it does not receive large investment funding from the manufacturers, the negotiations are based on pricing. The interaction with the retail stores is transactional and is always related to product prices. It was observed that there are considerable inventory disruptions in this wholesaler mainly due to price variations in the manufacturers' products. Because of the price variations, sometimes the wholesaler does not buy products from the manufacturer for four months. It was found that since the wholesaler does not develop the business plan with the manufacturers, it does not have a collaborative relationship with their sales managers. Therefore, changes that may occur in the manufacturers, for example, changes in product prices, in business conditions, and in the sales team, affect product supply to the wholesaler since there is no pre-established agreement between the companies.

Thus, it can be said that the joint planning between companies allows them to establish and align their priorities (categories, Brazilian regions, and sales channels) and to achieve their financial objective. Moreover, the greater the level of detail in the plan and the involvement of manufacturers, the more frequent the companies meet to discuss and monitor the execution of the business plan.

#### 4.1.3 Knowledge and resource sharing

The development of the business plan between the wholesaler and the manufacturer involves financial and non-financial investments. Manufacturers generally invest up to 2% of their gains resulting from the wholesaler sales, which represent a financial support for 80%-100% of the business plan actions.

The investments made by the manufacturers can promote the implementation of promotional campaigns in the wholesaler. However, the resources are mostly allocated to motivate the wholesaler sales reps, and therefore the retail stores receive few direct incentives. The intercompany supermarket chains reap more benefits when they take part in the sales campaigns launched by the wholesaler.

The senior executives of the wholesaler 1 highlighted the need for transparency of financial information provided to the manufacturers regarding the investments they make for the execution of the business plan. This accountability in financial reporting consists of presenting photos, graphics, and performance results to the manufactures.

In addition to making financial investments, most manufacturers have higher level of demand management maturity than that of the wholesalers

and retailers (Melo & Alcântara, 2015). Thus, they share this knowledge with the wholesalers that are willing to engage in joint business plan development. It is important to mention that the manufacturers have in-depth knowledge of their product categories. The wholesalers studied handle thousands of items, and without a closer relationship with the manufacturer it is difficult to keep up with the consumption trends for all of these products and to have access to the market research conducted by the manufacturers.

On the other hand, the wholesalers have knowledge about the management strategies adopted by the small and medium retailers. The wholesalers specialized in providing distribution services to them. Therefore, according the manufacturers' respondents, they have little knowledge of the operations of these retailers and how to relate with them. These results were also confirmed by Melo & Alcântara (2012).

#### 4.1.4 Performance indicators

Chart 7 shows the major performance indicators used by the wholesalers and manufacturers to monitor their business plans.

The only performance indicator in Chart 7 that was not mentioned by Melo & Alcântara (2015) was "diversification of products per order". Three respondents said that it is important to check whether product diversification was requested because the wholesalers handle thousands of items.

Therefore, the present study confirms that collaborative practices are critical factors for demand management in the supply chain, as reported in the literature. These practices will encourage and

**Chart 7.** Performance indicators used by the companies studied.

- total gross sales to the supply/wholesale distributor;
- sales values by category and sub-category;
- distribution: number of retail stores that realized sales;
- sales volume by distribution center;
- sales value by business segment;
- average order value;
- quantity of items per order;
- sales value by sales channel (Internet, telemarketing, sales reps);
- sales value by Nielsen area;
- inventory level;
- average inventory;
- level of inventory disruption;
- customer requested delivery date;
- volume of returned goods (wholesaler and retailer);
- diversification of products per order.

Source: field research.



promote the relationship between the companies studied, which, in turn, will contribute to a more effective implementation of demand management.

#### **4.2 Top management involvement**

It was found that there is involvement of top management in the development and approval of the business plan in the wholesalers and manufacturers studied.

Top management involvement is perceived by the respondents as an important factor in the alignment of expectations between companies, and they also believe that it reinforces the commitment to carry out actions since the top management team can allocate human and financial resources for the execution of the business plan. Furthermore, their involvement gives the business plan a special significance, i.e., the presence of senior executives in the meetings held to approve and monitor the plan emphasizes its importance for the organizations. Finally, the involvement of top management leads to flexibility and increased responsiveness to unexpected situations and facilitates the resolution of conflicts between organizations.

Therefore, top management involvement is essential to ensure the commitment of the teams and companies involved (Melo & Alcântara, 2015; Min et al., 2005).

#### **4.3 Customer and supplier segmentation**

It was found that the wholesalers segment their retail and manufacturing customers, and the manufacturers also segment their wholesale customers. Therefore, as previously reported by Melo & Alcântara (2015), the criteria used by companies to segment their suppliers (in the case of wholesaler) and customers (in the case of manufacturer) are product mix profitability and importance, their annual business revenue, and their relationship stage. The relationship stage is related to the interest of the manufacturer in distributing its products through the retail channel. This interest is shown by the ability of manufacturers or wholesalers to engage in a joint development of a business and investment plan, as well as to promote a closer interaction between the two companies.

According to a senior executive of the wholesaler 3, the company has adopted strategies to reduce the number of suppliers. In 2010, it had 118 suppliers, but in 2014 the number of suppliers was reduced to 38. This strategy resulted in a 40% growth between 2010 and 2011, 54% between 2011 and 2012, and 21% between 2012 and 2013. Of its 38 current suppliers, the company develops the business plan with only 10 manufacturers.

A senior executive of a manufacturing company stated that his company segments its wholesale customers into three categories: transactional, intermediate, and advanced. The transactional customer makes buying decisions based on price; the manufacturer generally sells a wide range of basic products, and this segment does not require large investments by the manufacturer. Still according to that respondent, the wholesalers 2 and 4 are included in this category.

On the other hand, the intermediate customer (wholesaler 3, according to the respondent) is the one with which the manufacturer can develop a business plan and has a trade marketing area that interacts with the manufacturer. The companies carry out joint actions to stimulate demand at the point of sale. Finally, the advanced customer (wholesaler 1, according to the respondent) is the one with which the manufacturer can develop a business plan that includes growth objectives by categories and regions, i.e., it is a more structured plan and requires larger investments.

Three out of the four wholesalers studied segment their retail customers into basic customers and those belonging to intercompany chains. Thus, they offer the customers belonging to the intercompany chains services such as training, store improvement projects, financial services, development of sales campaigns, and planning of promotional actions.

The retail stores do not segment their customers and/or suppliers. They treat all of them the same way.

It is important for companies to choose the customers/suppliers with whom they will form a partnership because not all of them are prepared to implement a joint demand management. According to Lambert (2004, 2008) and Lambert et al. (2005), companies need to define an organizational structure with representatives from each functional area involved in the demand management in order to serve these customers/suppliers. They should also define how their relationships will be developed and maintained. They will maintain a traditional relationship with the other customers/suppliers.

#### **4.4 Information Technology**

It was found that the level of information technology adoption in the companies studied is different. In the manufacturers, the software is integrated with the demand management module. All wholesalers believe they have an information system sufficiently robust to generate detailed information to develop the business plan with the manufacturers.

Most wholesalers studied provide their sales team with electronic devices, and the majority of the respondents said that their company was adopting

tablets with a software program that provides relevant product data. With this software, when customer data are entered, the information system provides the data of the products sold by the seller within that month (by category), identifies the products that were not sold, and offers sales suggestions.

Two of the wholesalers studied use telemarketing. A wholesaler senior executive said that if the sellers do not visit customers within 30 days, the information system redirects the customers to a telemarketer, besides making automatic calls based on the customer's buying habits.

All retailers studied have an automated management information system that offers a purchase suggestion. However, it was found that four retail stores spend from 3 to 4 hours each week or every two weeks creating their shopping lists because they perform a manual inventory count. The information system also helps in the preparation of sales forecast based on historical sales data and the experience of the owners and/or store managers. Based on the sales forecasts, the retailers set the sales goals for the store and its internal areas and define cost reduction goals.

It was observed that all companies studied have, according to their size and needs, a robust information technology to generate information for demand management. Moreover, they claim that their information technology system is constantly improved and optimized, as proposed by Al-Mudimigh et al. (2004). However, few companies can share information in real time across internal and external teams.

#### 4.5 Demand management adherence level

The level of adherence to demand management is related to the ability of companies to develop and implement demand management practices in the supply chain. Corroborating the findings of Melo & Alcântara (2015), it was found that the supermarket retailers, even when belonging to intercompany chains, adopt few demand management practices in the supply chain and have low level of demand management maturity.

It was observed that the low demand management adherence level of the retail stores is one of the main barriers to the successful maintenance or transition to collaborative buyer-seller relationship since all of the retailers studied still make short-term decisions based on prices. The relationship with wholesalers and manufacturers is, in most cases, transactional. A manufacturer senior executive said:

*Access to information has changed a lot; the shopper is changing and they (retailers) are not paying attention to it; they are concerned about the price. Then he (the retailer) spends 80% of the time buying products without worrying if the customer can find what he/she wants because he didn't buy*

*the product or because it is hidden somewhere on the shelf with difficult access.*

In addition, only three retailers hold periodic meetings with the wholesalers to discuss results and opportunities for improving the stores. In the cases in which there is effective communication between the partners studied, the functional conflicts are seen as positive because they prevent stagnation, stimulate interest and curiosity, and provide a medium through which problems can be discussed and solutions identified. Therefore, there may be an opportunity for the transition to a more collaborative relationship.

Most senior executives of the manufacturing companies stated that the wholesaler needs to identify what the retailer aims for, i.e., if they expect basic or complementary services. The basic services mentioned by the respondents include good price, on-time delivery, credit, and seller visits. The complementary services include being part of the intercompany chain, participating in the sales campaigns launched by the wholesaler, and receiving assistance and advisory to improve product mix to offer proper product assortment and improve the store layout. Another manufacturer senior executive stated:

*What is the greatest threat to these guys (retailers)? Superstores such as Walmart, Pão de Açúcar, and Carrefour have already understood that because of scarcity of time, consumers have increasingly avoided going to the supermarket. [...] So, here is what the superstores have done: Walmart, one of the largest retailers in the world, opened a discounter (smaller suburban store) called "Todo dia" ("Every Day"), Carrefour opened "Day%", and Pão de Açúcar opened "Extra Perto" ("Extremely Close") in São Paulo. These are all smaller stores and threaten retailers because the major chains have very good infrastructure and are opening a store beside the "mercadinho do seu Zé", a small, local, individually-owned grocery store.*

Most retail stores belonging to the intercompany chain acknowledge the advantages of the partnership with the wholesaler, but they wait passively for the wholesaler to develop improvement initiatives.

It is found that the retailers who do not have a relationship with the wholesalers tend to have more problems such as disruptions of the point of sale because buying decisions based on the lowest price often lead to split delivery.

Melo & Alcântara (2012) found that when the wholesaler develops a business plan with the manufacturer, the partners work together to identify opportunities to increase sales and improve product distribution. The wholesaler has vast experience serving small and medium retailers, while the manufacturer's experience concerns the final product

**Chart 8.** Summary of results obtained.

<b>Critical factors for successful implementation of demand management process</b>		<b>Description</b>
Collaborative management	Information sharing	-Information sharing occurs especially in the dyadic relationship between wholesalers and manufacturers. - Information sharing between wholesalers and retailers occurs when the retailer is part of a supermarket chain whose purchasing center belongs to the wholesaler.
	Planning and execution of joint actions	- Interaction between wholesalers and manufacturers for joint alignment of the company strategic guidelines; business plan development; and implementation and monitoring of the business plan. - Transactional relationships between wholesalers and the retail stores.
	Resource and knowledge sharing	- The development of the business plan between the wholesaler and the manufacturer involves financial investments, intended for the implementation of promotional campaigns, and non-financial investments, which include sharing retail market and product category knowledge.
	Performance indicators	- Information about gains, sales, distribution, order, inventory, delivery date, and product return.
Top management involvement		- Aligns expectations between companies. - Reinforces the commitment to carry out actions. - Gives the business plan a special significance. - Leads to flexibility and increased responsiveness to unexpected situations.
Customer and supplier segmentation		- Wholesalers and manufacturers segment their suppliers and customers, respectively, according to the importance of the company and product mix and profitability. - Wholesalers segment their retail customers into basic customers and those belonging to intercompany chains (those who have chains). - Retail stores do not segment their customers and suppliers.
Information technology		- Each company has, according to its size and needs, a robust information technology to generate information for demand management. - Only a minority of companies can share information in real time across internal and external teams.
Demand management adherence level		- Retail stores make short-term buying decisions based on prices. - Only a minority of retail stores hold periodic meetings with the wholesalers to discuss results and opportunities for improving the stores.

Source: elaborated by the authors.

and final consumer. Thus, only after several internal and external meetings and discussions, is the business plan approved (Melo & Alcântara, 2012).

The retail stores that buy products from these wholesalers, especially those belonging to the intercompany chains, benefit from the wholesaler according to the strategies established by the manufacturer and the wholesaler in the business plan. Therefore, the retailer, who not always has access to management tools, follows the strategies given by the companies that have more knowledge and market experience. It was observed that the retailers studied often achieve better results with the implementation of these strategies when they can build trust and improve communication with the companies. According to Rexhausen et al. (2012),

demand management adherence level is directly related to improvement of demand and supply chain management performance.

Chart 8 summarizes the results discussed in this topic.

## 5 Conclusions

This study aimed to identify and analyze the critical success factors for improvement of demand management performance in a grocery supply chain including manufacturers, wholesalers, and retailers. The results of the present study confirmed findings of existing literature in the area by identifying the following critical factors: collaborative management (information sharing, planning and execution joint actions, resource and knowledge sharing, performance

indicators), top management involvement, customer and supplier segmentation, information technology, and demand management adherence level.

It was observed that the wholesalers, manufacturers, and retailers studied have different level of demand management maturity. Based on the critical success factors, most manufactures have higher level of demand management maturity, confirming the findings of Melo & Alcântara (2015). This fact highlights the importance of these companies in terms of knowledge sharing and learning to help other supply chain agents develop demand management practices.

On the other hand, the results obtained suggest that supermarket retailers, even those belonging to intercompany chains, adopt few demand management practices in the supply chain and have low level of demand management maturity. The low demand management adherence level of the retail stores is one of the main barriers to implement and maintain collaborative buyer-supplier relationships because all of the retailers studied still make short-term decisions based on prices. Therefore, it is extremely important to encourage retailers to improve their demand management practices.

The present study contributes to the literature on demand management in the supply chain since it identifies and analyzes the key factors for the successful implementation of the demand management process in the segment investigated. This is an empirical research based on information provided by senior executives of the three supply chain link companies studied. Although this study is limited to the grocery sector, it highlights key factors for the implementation of demand management between strategic partners in the supply chain.

The approaches identified in the literature (Croxton et al., 2008; Esper et al., 2010; Hilletofth et al., 2009; Juttner et al., 2007; Mentzer & Moon, 2005) did not explore empirically the critical factors that favor the implementation of the demand management process. Anning et al. (2013) identified some critical factors, but their study included only the retail link. Rexhausen et al. (2012) conducted an empirical research, but they did not consider the relationship of the supply chain links. Melo & Alcântara (2015) focused on the dimensions to assess the level of demand management maturity in the supply chain.

Therefore, the main contributions of the present study to the literature are related to the consolidation of the critical factors for successful implementation of the demand management process in the supply chain and to the analysis of these factors considering three supply chain links. No studies identifying and analyzing all critical factors and no empirical research including more than one supply chain link were found.

The managerial implications are related to supply chain efficiency and effectiveness improvements. It was observed that the more advanced the demand management practices adopted by companies, the better their financial results. This fact results from the possibility of better control of inventories, the development of joint actions when the inventory level is high, the sharing of costs and efforts to develop initiatives, the sales campaigns, and the promotional activities developed for retail stores and sales reps. Other positive effects are the improvement in the process of production planning and control of manufacturers, in terms of obtaining a more accurate forecast of the amount of raw material needed to meet the demand, and more guarantee to the wholesaler in relation to the production and supply capacity of the manufacturer.

Furthermore, companies can achieve sales goals since there are more retail stores carrying the manufacturers' products, greater product assortment and improved product display in the point of sale, better communication with the sales reps, and more training to better serve the retailers. Service level is also improved leading to smoother operations preventing disruptions in the wholesalers and the retail stores. Accordingly, the companies seek to promote interactions among their internal teams to solve problems together. Finally, the companies have the opportunity to share knowledge and learning because they absorb each other's best practices due to frequent inter and intra-company interactions.

Although the critical factors for demand management identified in the present study may reflect the reality of other companies, this study was limited to a specific supply chain; therefore, the degree of comprehensiveness of the concepts or experiences addressed should be further investigated. Moreover, the sector chosen and the number of companies investigated are limited because only companies within the grocery sector were studied. Further studies on demand management in the supply chain should include:

- a quantitative approach to validate the critical success factors for demand management;
- other industrial sectors for comparative analysis;
- larger supermarket chains or a larger number of supply chains; and
- an objective assessment of the financial results.

## Acknowledgements

The authors are grateful for the financial support provided by the *Fundação de Amparo à Pesquisa do Estado de Minas Gerais* – FAPEMIG (Minas Gerais State Research Foundation)



## References

- Al-Mudimigh, A. S., Zairi, M., & Ahmed, A. M. M. (2004). Extending the concept of supply chain: the effective management of value chains. *International Journal of Production Economics*, 87(3), 309-320. <http://dx.doi.org/10.1016/j.ijpe.2003.08.004>.
- Anning, K. S., Okyere, S., & Annan, J. (2013). Demand chain management model: a tool for stakeholders' value creation. *International Journal of Business and Social Research*, 3(12), 37-47.
- Bauer, M. W. (2002). Análise de conteúdo clássica: uma revisão. In M. W. Bauer, G. Gaskell (Eds.), *Pesquisa qualitativa com texto, imagem e som* (Manual Prático, pp. 189-217). Petrópolis: Vozes.
- Bower, P. (2006). How the S&OP process creates value in the supply chain. *Journal of Business Forecasting*, 25, 20-32.
- Chen, H., Daugherty, P. J., & Roath, A. S. (2009). Defining and operationalizing supply chain process integration. *Journal of Business Logistics*, 30(1), 63-84. <http://dx.doi.org/10.1002/j.2158-1592.2009.tb00099.x>.
- Chong, A. Y.-L., & Zhou, L. (2014). Demand chain management: relationships between external antecedents, web-based integration and service innovation performance. *International Journal of Production Economics*, 154, 48-58. <http://dx.doi.org/10.1016/j.ijpe.2014.04.005>.
- Croxton, K. L., Lambert, D. M., García-Dastugue, S. J., & Rogers, D. S. (2008). The demand management process. In D. M. Lambert. *Supply chain management: processes, partnerships, performance* (pp. 87-104). Florida: Supply Chain Management Institute.
- Esper, T. L., Ellinger, A. E., Stank, T. P., Flint, D. J., & Moon, M. (2010). Demand and supply integration: a conceptual framework of value creation through knowledge management. *Academy of Marketing Science*, 38(1), 5-18.
- Fawcett, S. E., Magnan, G. M., & Mccarter, M. W. (2008). A three-stage implementation model for supply chain collaboration. *Journal of Business Logistics*, 29(1), 93-112. <http://dx.doi.org/10.1002/j.2158-1592.2008.tb00070.x>.
- French, J. P., Jr., & Raven, B. (1959). The bases of social power. In D. Cartwright, (Ed.), *Studies in social power* (pp. 259-269). Ann Arbor: University of Michigan Press.
- Hall, J. M., & Johnson, M. E. (2009). When should a process be art, not science? *Harvard Business Review*, 87, 58-65.
- Hilletofth, P. (2010). Demand-supply chain management: industrial survival recipe for new decade. *Industrial Management & Data Systems*, 111(2), 184-211. <http://dx.doi.org/10.1108/02635571111115137>.
- Hilletofth, P., & Ericsson, D. (2007). Demand chain management: next generation of logistics management. *Conradi Research Review*, 4(2), 1-17.
- Hilletofth, P., Ericsson, D., & Christopher, M. (2009). Demand chain management: a Swedish industrial case study. *Industrial Management & Data Systems*, 109(9), 1179-1196. <http://dx.doi.org/10.1108/02635570911002261>.
- Holweg, M., Disney, S., Holmstrom, J., & Smaros, J. (2005). Supply chain collaboration: making sense of the strategy continuum. *European Management Journal*, 23(2), 170-181. <http://dx.doi.org/10.1016/j.emj.2005.02.008>.
- Horvath, L. (2001). Collaboration: the key to value creation in supply chain management. *Supply Chain Management: An International Journal*, 6(5), 205-207.
- Juttner, U., Christopher, M. & Baker, S. (2007). Demand chain management-integrating marketing and supply chain management. *Industrial Marketing Management*, 36, 377-391.
- King, N. (1998). Template analysis. In G. Symon & C. Cassell (Eds.), *Qualitative methods and analysis in organizational Research: a practical guide* (pp. 118-134). Thousand Oaks: Sage.
- Lambert, D. M. (2004). The eight essential supply chain management processes. *Supply Chain Management Review*, 8(6), 18-26.
- Lambert, D. M. (2008). Supply Chain Management. In D. M. Lambert. *Supply chain management: processes, partnerships, performance* (pp. 1-23). Florida: Supply Chain Management Institute.
- Lambert, D. M., García-Dastugue, S. J., & Croxton, K. L. (2005). An evaluation of process-oriented supply chain management frameworks. *Journal of Business Logistics*, 26(1), 25-51. <http://dx.doi.org/10.1002/j.2158-1592.2005.tb00193.x>.
- Lau, K. H. (2012). Demand management in downstream wholesale and retail distribution: a case study. *Supply Chain Management: An International Journal*, 17(6), 638-654.
- Lejeune, M. A., & Yakova, N. (2005). On characterizing the 4 C's in supply chain management. *Journal of Operations Management*, 23(1), 81-100. <http://dx.doi.org/10.1016/j.jom.2004.09.004>.
- Meehan, J., & Wright, G. H. (2011). Power priorities: a buyer-seller comparison of areas of influence. *Journal of Purchasing and Supply Management*, 17(1), 32-41. <http://dx.doi.org/10.1016/j.pursup.2010.05.002>.
- Melo, D. C., & Alcântara, R. L. C. (2011). A gestão da demanda em cadeias de suprimentos: uma abordagem além da previsão de vendas. *Gestão & Produção*, 18(4), 1-16. <http://dx.doi.org/10.1590/S0104-530X2011000400009>.
- Melo, D. C., & Alcântara, R. L. C. (2012). Proposição de um modelo para a gestão da demanda: um estudo entre os elos atacadista e fornecedores de produtos de mercearia básica. *Gestão & Produção*, 19(4), 759-777. <http://dx.doi.org/10.1590/S0104-530X2012000400008>.
- Melo, D. C., & Alcântara, R. L. C. (2015). Um modelo da maturidade da gestão da demanda: um estudo multicase

- na cadeia de suprimento de produtos de mercearia básica. *Gestão & Produção*, 22(1), 53-66. <http://dx.doi.org/10.1590/0104-530X0701-13>.
- Mentzer, J. T., & Moon, M. A. (2005). *Sales forecasting management: a demand management approach*. Thousand Oaks: Sage.
- Mentzer, J. T., Fonghin, J. H., & Golicic, S. L. (2000). Supply chain collaboration: enablers, impediments and Benefits. *Supply Chain Management Review*, 4(4), 52-58.
- Mentzer, J. T., Moon, M. A., Estampe, D., & Margolis, G. (2007). Demand management. In J. T. Mentzer, M. B. Myers & T. P. Stank. *Handbook of global supply chain management* (pp. 65-85). Thousand Oaks: Sage.
- Milliken, A. L. (2008). Sales & operations planning: building the foundation. *Journal of Business Forecasting*, 27, 4-12.
- Min, S., Roath, A. S., Daugherty, P. J., Genchev, S. E., Chen, H., Arndt, A. D., & Richey, R. G. (2005). Supply chain collaboration: what's happening? *The International Journal of Logistics Management*, 16(2), 237-256. <http://dx.doi.org/10.1108/09574090510634539>.
- Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3), 20-38. <http://dx.doi.org/10.2307/1252308>.
- Mouritsen, J., Skjott-Larsen, T., & Kotzab, H. (2003). Exploring the contours of supply chain management. *Integrated Manufacturing Systems*, 14(8), 686-695. <http://dx.doi.org/10.1108/09576060310503483>.
- Parker, D., & Hartley, K. (1997). The economics of partnership sourcing versus adversarial competition: a critique. *European Journal of Purchasing & Supply Management*, 3(2), 115-125. [http://dx.doi.org/10.1016/S0969-7012\(97\)00004-X](http://dx.doi.org/10.1016/S0969-7012(97)00004-X).
- Rainbird, M. (2004). Demand and supply chains: the value catalyst. *International Journal of Physical Distribution & Logistics Management*, 34(3/4), 230-250. <http://dx.doi.org/10.1108/09600030410533565>.
- Rexhausen, D., Pibernik, R., & Kaiser, G. (2012). Customer-facing supply chain practices—The impact of demand and distribution management on supply chain success. *Journal of Operations Management*, 30(4), 269-281. <http://dx.doi.org/10.1016/j.jom.2012.02.001>.
- Sabath, R. E., & Fontanella, J. (2002). The unfulfilled promise of supply chain collaboration. *Supply Chain Management Review*, 6(4), 24-29.
- Santos, J. B., & D'Antone, S. (2014). Reinventing the wheel? A critical view of demand-chain management. *Industrial Marketing Management*, 43(6), 1012-1025. <http://dx.doi.org/10.1016/j.indmarman.2014.05.014>.
- Simatupang, T. M., & Sridharan, R. (2002). The collaborative supply chain. *The International Journal of Logistics Management*, 13(1), 15-30. <http://dx.doi.org/10.1108/09574090210806333>.
- Soonhong, M., & Mentzer, J. T. (2000). The role of marketing in supply chain management. *International Journal of Physical Distribution & Logistics Management*, 9(30), 765-787.
- Stank, T. P., Keller, S. B., & Daugherty, P. J. (2001). Supply chain collaboration and logistical service performance. *Journal of Business Logistics*, 22(1), 29-48. <http://dx.doi.org/10.1002/j.2158-1592.2001.tb00158.x>.
- Vieira, J., Yoshizaki, H., & Ho, L. (2009). Collaboration intensity in the Brazilian supermarket retail chain. *Supply Chain Management: an international Journal*, 14(1), 11-21. <http://dx.doi.org/10.1108/13598540910927269>.
- Vollmann, T. E., Berry, W. L., Whybark, D. C., & Jacobs, F. R. (2004). *Manufacturing planning and control for supply chain management*. Boston: McGraw-Hill.
- Walters, D. (2006). Demand chain effectiveness supply chain efficiencies. *Journal of Enterprise Information Management*, 19(3)
- Walters, D., & Rainbird, M. (2004). The demand chain as an integral component of the value chain. *Journal of Consumer Marketing*, 21(7), 465-475. <http://dx.doi.org/10.1108/07363760410568680>.
- Webster, F. E. (1992). The changing role of marketing in the corporation. *Journal of Marketing*, 56(4), 1-17. <http://dx.doi.org/10.2307/1251983>.
- Yin, R. K. (2005). *Estudo de caso: planejamento e métodos*. Porto Alegre: Bookman.