ABSTRACT
Electronic Business (e-business) embraces the buying and selling of products and services over the internet as well as internet-based communication and web-enabled business processes. Nowadays, this internet-based way of doing business is changing industries and markets and will therefore have an impact on consumers and businesses. This paper focuses on e-business and the changes it brings about in the retail industry and its businesses. In particular, the objective of this paper is to review the literature regarding Business-to-Business (B2B) e-business initiatives with focus on the supply chain and to apply this on a leading Belgian food retailer.

KEYWORDS
B2B, supply chain, food retail

1. INTRODUCTION
Today, industries are highly influenced by technological progress, especially in Information Technology (IT). The rise of the internet and of various e-business applications has strongly affected nearly all industries. Reductions in costs (Lucking-Reiley and Spulber, 2001; Garicano and Kaplan, 2001) as well as streamlining of business processes were promised (Chan and Artmankorn, 2002). As a result, a number of large retailers have taken their chance. Examples are Wal-Mart’s Retail Link (Johnson, 2002), the GlobalNetXchange (www.gnx.com) initiated by Carrefour and Sears Roebuck (Eng, 2004), and Benetton’s United Web (Camuffo et al., 2001). They adopt new technologies and develop new business practices with their suppliers or customers and that is coupled with a fundamental change in the way retailers manage their supply chains.

This paper focuses on the changes the internet and the various B2B e-business initiatives bring about in the retail supply chain. The aim is to review the literature regarding B2B e-business initiatives and the current retail industry and organizational trends attendant upon it.

Figure 1 depicts a typical retail distribution chain with supplier, retailer, and consumer. When we talk about B2B e-business initiatives, we refer to the B2B e-business functionalities that are used between the retailer’s distribution center and its suppliers, and the retailer’s distribution center and the local retail stores. These B2B e-business initiatives will be presented from a management, rather than from a technical perspective.
The paper is structured as follows. First, an e-business definition and description is given. Second, the relevant background literature concerning B2B commerce is reviewed. Based on the literature review, a framework regarding the impact of B2B e-business initiatives on the retail sector is derived and propositions are developed. Third, these propositions are confronted with a study within a leading Belgian food retailer. Finally, some suggestions for further research will be presented.

2. Defining e-business

Concepts often used in conjunction with the use of internet technology are e-commerce and e-business. There is a subtle but important difference between these terms. In general, e-business is about buying and selling of goods and services over the internet, internet-based communication, and web-enabled business processes, while e-commerce is only about buying and selling of goods and services over the internet. In other words, e-business embraces e-commerce. When we are talking about e-business in this paper, we refer to the definition of Turban et al. (2000). According to Turban et al. (2000), e-business can be described as the process of buying and selling or exchanging of products, services, and information; generating demand for them through marketing and advertising; servicing customers; collaborating with business partners; and conducting electronic transactions within an organization via computer networks including the internet (Turban et al., 2000, p.5).

The following common types of e-business can be distinguished: business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), and consumer-to-business (C2B). Researchers generally expect the value of B2B e-business transactions to exceed that of B2C, C2C, and C2B e-business transactions due to the enormous volume of goods and services traded between firms (Garicano and Kaplan, 2001). The B2B segment can be seen as the most important segment and accounts for approximately 70-85% of the total electronic business (OECD, 1999). Therefore, in this paper attention will be paid to e-business initiatives in the B2B arena. In particular, the paper investigates the impact of B2B e-business initiatives on the retail supply chain. The aim is to answer the following questions:

*Research question 1:* What is the impact of B2B e-business initiatives on the retailer’s business processes?
*Research question 2:* What is the impact of B2B e-business initiatives on the retailer-supplier relationship?
*Research question 3:* What is the impact of B2B e-business initiatives on the retail supply chain’s intermediate links?

In an attempt to answer the research questions, the literature will be reviewed and propositions will be developed.

3.1 Transforming the retailer’s business processes

The advent of the internet contributes to a transformation of the organization’s value chain and the way companies organize their business (Strader and Shaw, 1997; Prastacos et al., 2002). In the past, the economics of information were governed by a trade-off between information richness and information reach. The communication of rich information required proximity and dedicated channels, thereby limiting geographical range. As a result, firms traditionally constructed their value chains by bundling information, and physical products and services into integrated structures. Internet, however, brings into question this traditional trade-off between richness and reach of information (Evans and Wurster, 1997). ‘When information is carried by things, it goes where the things go and no further. It is constrained to follow the linear flow of the physical value chain. But once everyone is connected electronically, information can travel by itself’ (Evans and Wurster, 1997, p.73). Today, organizations can provide a vast amount of customized and interactive information to a mass audience. By unbundling information from the physical products and services, internet enables firms to deconstruct their value chains (Evans and Wurster, 1997). Value chain deconstruction refers to the fragmentation of the vertically integrated value chain. Private banking is used by Evans and Wurster (1997) as an example for the deconstructed scenario.

Rayport and Sviokla (1994) distinguish between the marketplace, where physical products and physical locations are important, and the marketspace, where information substitutes for physical products and physical locations. To illustrate the difference between the marketplace and the marketspace, Rayport and Sviokla (1994) use the example of AUCNET (www.aucnet.co.jp), the Japanese secondhand car auction. ‘The traditional marketplace interaction between physical seller and physical buyer has been eliminated. In fact, everything about this new kind of transaction – what we call a marketspace transaction – is different from what happens in the marketplace: the content of the transaction is different: information about the cars replaces the cars themselves; the context in which the transaction occurs is different: an electronic, on-screen auction replaces a face-to-face auction; and the infrastructure that enables the transaction to occur is different: computers and communication lines replace car lots’ (Rayport and Sviokla, 1994, p.142). Furthermore, Rayport and Sviokla (1995) propose the virtual value chain. The virtual value chain is a new value chain in virtual space that runs parallel to the physical value chain of products and services and consists of ‘gathering, organizing, selecting, synthesizing, and distributing of information’ (Rayport and Sviokla, 1995, p.76).

Virtual value chains can lead to virtual organizations through virtual outsourcing (Lawton and Michaels, 2001). Virtual outsourcing refers to ‘the devolution of cost incuring and revenue generating business functions, via e-business, to strategic partners and even to the customer (in the case of internet sales). This means in effect that although the cost and responsibility are outsourced, control remains with the company’ (Lawton and Michaels, 2001, p.102). As a result, each organization will focus on a limited number of core competencies (Prahalad and Hamel, 1990).

The virtual organization is defined in many different ways (e.g. Bultje and van Wijk, 1998; Venkatraman and Henderson, 1998; Ahuja and Carley, 1999; Kraut et al., 1999). Kraut et al. (1999), for example, refer to virtualization as outsourcing activities. being virtual is only a matter of degree. An organization becomes more virtual when more of its activities are performed outside the organization’s boundaries (Kraut et al., 1999). An example is Dell’s (www.dell.com) virtual integration approach (Lawton and Michaels, 2001) of ‘stitching together a business with partners that are treated as if they’re inside the company’ (Magretta, 1998, p.75).

The discussion above shows that the transformation of the value chain through internet technology is a recognized phenomenon. Authors write about value chain deconstruction, the marketspace, virtual value chains,
the virtualization of business processes, and the virtual organization. We assume that this is also true for the retailer’s value chain and the way in which retailers organize their business. Like Zwass (2003), we believe that ‘as companies increasingly specialize, and as information technologies make intercompany coordination increasingly feasible and cost-effective, the process in corporate value chains can be outsourced to their most effective sources. Here, the web is becoming the universal value-chain linkage, as corporate business processes are supported with web-enabled information systems’ (Zwass, 2003, p.15). We take into consideration the ‘virtualization’ or ‘outsourcing’ of some of the retailer’s business processes which is defined here as moving some of value chain tasks formerly performed by the retailer to other supply chain members in order to try to combine skills and knowledge. All this leads us to formulate the following proposition:

**Proposition 1**: For retailers engaging in B2B e-business initiatives, business processes will be virtualized.

Until now, we have only touched upon the changes to the organization’s internal value chain. However, B2B e-business initiatives can also have an impact on the organization’s relationship with its upstream supply chain partners such as suppliers and intermediaries.

### 3.2 Impact of B2B e-business initiatives on retailer-supplier relationships

In 1987, Malone, Yates and Benjamin formulated the Electronic Market Hypothesis (EMH). According to the EMH, the use of IT will lead to an increased use of markets to coordinate economic activity at the expense of hierarchical coordination. Thus, buyers will increase the number of suppliers they consider (Malone et al., 1987). However, a number of authors have given alternative views of the impact of information technology on the choice of governance mechanism used between buyers and sellers. They independently argue that the introduction of IT may result in fewer suppliers, despite the reduction in transaction costs (Johnston and Lawrence, 1988; Holland et al., 1992; Brynjolfsson et al., 1994). Evidence from a number of studies points to the same trend of fewer suppliers (e.g. Jarillo, 1988; Helper, 1991; Dyer and Ouchi, 1993; Holland et al., 1994; Dyer, 1996).

Hess and Kemerer (1994) tested the EMH by means of five case studies of Computerized Loan Origination systems (CLOs) in the home mortgage industry and found no evidence of a shift towards electronic markets. Clemons, Reddi and Row (1993) propose the ‘Move to the Middle’ Hypothesis (MMH) instead of a ‘move to the market’ (Malone et al., 1987). They focus on long-term partnerships with a reduced number of preferred suppliers (Clemons et al., 1993). Bakos and Brynjolfsson (1993a, 1993b) confirm the ‘move to the middle’ hypothesis, using the incomplete contracting framework developed by Grossman and Hart (1986) and Hart and Moore (1990). Holland and Lockett (1997) define the ‘mixed mode’ hypothesis. This hypothesis states that organizations operate on a continuum between hierarchies and markets and increasingly choose combinations of these two coordination mechanisms (Holland and Lockett, 1997). Daniel and Klimis (1999) observed some of the elements of the EMH in the retail financial services sector and the music industry. Therefore, they consider the model as only partially valid today (Daniel and Klimis, 1999). Finally, Afuah (2003) studied the impact of the emergence and diffusion of the internet on firm boundaries. He suggests that ‘the emergence and diffusion of the internet – moderated by information dependence, information tacitness, and technology – will either shrink or expand vertical firm boundaries, depending on the determinants of transaction (i.e. asset specificity, information asymmetry, and opportunism) and production costs (i.e. capital and labor production requirements) that existed prior to the emergence and diffusion’ (Afuah, 2003, p.45). Hence, he suggests that vertical firm boundaries do not necessarily shrink with the emergence and diffusion of the internet.

As described above, there has been discussion in the literature concerning the impact of IT on the choice of governance mechanism used between buyers and suppliers. Overall, IT has been argued to influence this choice in one of two directions. On the one hand, by connecting large numbers of buyers and suppliers and reducing transaction costs, IT supports the market or transactional exchange (Malone et al., 1987). A market mechanism is used with suppliers with whom business is conducted on a transaction-by-transaction basis (Garcia-Dastugue and Lambert, 2003) and is characterized by discrete transactions. Typically, market exchanges involve a short term
orientation, basic products, the focus of the relationship is price, and the information exchanged is limited to the transaction (Dwyer et al., 1987; Frazier et al., 1988; Anderson and Narus, 1991). Besides, market exchanges are typified by small investments by both buyers and sellers, and sometimes conflicting retailer-supplier relationships (Sheth and Shah, 2003). On the other hand, by enabling two organizations to change and integrate processes that create and use information, IT has created cooperative forms of coordination between buyers and sellers. In the literature, different cooperative relations have been identified such as networks, alliances, value-adding partnerships, and joint ventures. We refer to co-operative relations between retailers and suppliers as ‘retailer-supplier partnerships’ (cf. Buzzell and Ortmeyer, 1995; Mentzer et al., 2000). Retailer-supplier partnerships are close, long-term relationships which focus on the core product and pay attention to value-added services (Frazier et al., 1988). The information exchanged is not limited to the transaction, but encompasses also information such as demand forecasts and long term planning (Frazier et al., 1988; Ellram and Hendrick, 1995; Mentzer, 2000). Partnerships are characterized by large investments by both retailers and suppliers (Sheth and Shah, 2003).

Dyer et al. (1998) state that firms should think strategically about supply chain management instead of employing a ‘one-size-fits-all’ strategy for procurement (Dyer et al., 1998). It is possible to pursue a composite strategy (Burton, 1995) and to manage a portfolio of buyer-supplier relationships (Bensaou, 1999). Sheth and Shah (2003), for example, suggest that buyers will choose for a relational or a transactional exchange depending on the industry structure, the decision making culture, the decision making structure, the tolerance for risk, the nature of the purchase, and the transaction costs (Sheth and Shah, 2003).

Analogously, we suppose that retailers who use B2B e-business initiatives use different types of exchanges, transactional and relational, with their suppliers. Thus, in some cases, B2B e-business initiatives have been used for supporting the market exchange between retailers and suppliers. Therefore we propose that:

Proposition 2: In ‘some’ cases, retailers engaging in B2B e-business initiatives will choose the market exchange and with it increase the number of suppliers.

Nevertheless, B2B e-business initiatives have also created cooperative forms of coordination termed retailer-supplier partnerships. Therefore we propose that:

Proposition 3: In ‘some’ cases, retailers engaging in B2B e-business initiatives will choose long-term retailer-supplier partnerships with a select group of suppliers.

3.3 B2B e-business initiatives and the intermediate links in the upstream supply chain

One of the most common views of the changes that e-business brings about is the elimination of intermediate links; so called disintermediation or ‘cutting out the middlemen’. Benjamin and Wigand (1995), Gellman (1996), Prahalad (1998), Ghosh (1998), and Berghel (2000) note that technological developments lead to firms being able to approach end users directly and this together with a simultaneous reduction in transaction costs results in an elimination of the further stages in the value chain or disintermediation.

The ‘disintermediation hypothesis’, however, focuses mainly on the cost of intermediation, not on the value that intermediaries can add (Giaglis et al., 2002). Therefore, it has received limited support from practice. Empirical studies report that intermediaries can still remain in the e-business value chain and still have important transaction support roles (Sarkar et al., 1995; Bailey and Bakos, 1997), such as matching buyers and sellers, and providing trust relationships (Bailey and Bakos, 1997; Bakos, 1998). Sarkar et al. (1995, 1998) refer to the predictions about the elimination of the middlemen in the value chains as the ‘Threatened Intermediaries Hypothesis’. They argue that more rather than fewer intermediaries will be involved (Sarkar et al., 1995; Sarkar et al., 1998). The results of an exploratory study by Bailey and Bakos (1997), suggesting that markets does not become disintermediated in the near future although some of the traditional roles of intermediaries may become less important due to advances in IT, support their theory.
Some authors note the formation of new intermediaries. Sarkar et al. (1995, 1998) stress the role of cybermediaries, "organizations that operate in electronic markets to facilitate exchanges between producers and consumers by meeting the needs of both producers and consumers" (Sarkar et al., 1998, p.215). Vandermerwe (1999) discusses the role of the ‘go-between service provider’, an intermediary that focuses on the improvement of customer experience, and thus on a better match between demand and supply. Well-known examples of ‘go-between service providers’ are Amazon.com (www.amazon.com) for books and Peapod (www.peapod.com) for retail home shopping (Vandermerwe, 1999). Ordanini and Pol (2001) note that ‘new categories of intermediaries are now emerging in the B2B environment and creating marketplaces where supply and demand might match by using organized virtual platforms’ (Ordanini and Pol, 2001, p.276). These new categories of intermediaries, named infomediaries, act as aggregator and facilitator (Ordanini and Pol, 2001). New types of intermediaries are portals, auctioneers, and hubs (Kaplan and Sawhney, 2000; Mahadevan, 2000; Wise and Morrison, 2000). A variation on this theme is the information intermediary or ‘infomediary’ (Hagel III and Rayport, 1997; Hagel III and Armstrong, 1997; Grover and Teng, 2001). Infomediaries such as search engines and e-tailers provide some important informational services to buyers and sellers which Grover and Teng (2001) describe as search/complexity services, matching services, content services, community services, informational services, privacy protection services, and infrastructure services (Grover and Teng, 2001). According to Sawhney et al. (2003), organizations need to complement their direct channels of customer interaction with indirect channels to help them bridge the gaps in customer knowledge which hampers innovation. They call this process of mediated innovation, ‘innomedia’; and they identify three innomedia types, namely customer network operator, customer community operator, and innovation marketplace operator (Sawhney et al., 2003). Besides, Golicic and Davis (2003) talk about hypermediaries. Also Quelch and Klein (1996), Palvia and Vemuri (1999), and Anderson and Anderson (2002) state that while some traditional functions performed by intermediaries may be eliminated; newer forms of intermediaries will emerge to fulfill the e-business needs. E-business creates opportunities for new intermediaries.

Other authors discuss the ‘reintermediation scenario’. Chircu and Kauffman (1999a, 1999b, and 2000) define the Intermediation-Disintermediation-Reintermediation (IDR) cycle which shows that traditional intermediaries will be able to reintermediate in the long run as they become ‘e-business-able’ intermediaries, intermediaries which ‘conduct business using both traditional methods and on-line, interactive electronic business applications’ (Chircu and Kauffman, 2000, p.18).

As described above, we classify the impact of B2B e-business initiatives on intermediation into three different scenarios: the disintermediation, the cybermediation, and the reintermediation scenario.

We will investigate if traditional intermediaries, previously participating in the retail supply chain, will be disintermediated after the introduction of B2B e-business initiatives when they continue to perform their functions as they did before and do not adapt to the new situation. Disintermediation, however, is more likely to happen in complicated supply chains with many different participants than when the chain is already short. The following proposition can be formulated:

**Proposition 4**: B2B e-business initiatives eliminate the traditional intermediaries in the retail supply chain.

On the other hand, we suppose that with the introduction of B2B e-business initiatives new intermediaries will emerge in the retail supply chain. Hence, we propose:

**Proposition 5**: B2B e-business initiatives create opportunities for new intermediaries in the retail supply chain.

In this section we discussed the impact of B2B e-business initiatives on the retail supply chain. Figure 2 summarizes the impact of B2B e-business initiatives on the retail organization and the retail industry and depicts research questions and corresponding propositions. We want to remark that the list of possible consequences of the adoption of B2B e-business initiatives for the retail supply chain is not intended to be exhaustive.
4. THE CASE OF A MAJOR BELGIAN FOOD CHAIN

The case focuses on an international food retailer headquartered in Belgium. At the end of 2003, it operated a sales network of 2559 sales outlets in twelve countries and on three continents (United States, Europe, and Asia). The company runs stores under a variety of banners which can be grouped into three categories: supermarkets, convenience stores, and specialty stores. The use of new technologies is important in the strategy of the food retailer Group. After all, technology facilitates anticipating and responding the customer needs, increasing sales and margins, and reducing costs. First, the food retailer focuses on new technologies for customers including the loyalty card, self-scanning, and e-commerce to increase customer convenience. Further, the food retailer uses new technologies throughout the supply chain such as EDI, CPFR, and an e-marketplace (The food retailer Group, 2002b). Principally these initiatives and their impact on the internal value chain and upstream supply chain will be discussed in the following sections.
4.1 Research design

We have developed propositions regarding the impact of B2B e-business initiatives on the retail supply chain out of the existing literature. These propositions are tested with the case study methodology. Case research is particularly appropriate for research within the IT area because researchers in this field are often behind practitioners in discovering and explaining new methods and techniques (Benbasat et al., 1987). Examples are Malone et al. (1987), Vandermerwe (1999), and den Hengst and Sol (2002). Moreover, the case study allows in-depth examination of a complex phenomenon. This is certainly true for B2B e-business initiatives and their impact on the retail supply chain.

When choosing the case approach, the researcher has the choice between a single and a multiple case study design. In this paper, a single case study approach is adopted to gain an understanding of the impact of B2B e-business initiatives on the retail supply chain. A single case design is particularly appropriate for a revelatory case, where ‘an investigator has the opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation’ (Yin, 2003, p.42).

The results reported in this paper are primarily based on interviews with the Director of Information Technology and the Vice President Procurement Development from the food retailer. Beside interviews, written documentation is used. The written documentation component includes internal management presentations, the website, the annual report 2002, ‘The Case for Global Standards’ from CGE&Y (2002), and articles from ean-belgium’ Bulletins (www.eanbelgium.be).

One of the major critics on case study research is the lack of generalizability (Ellram, 1996). Therefore, the results presented in this paper have to be understood within the limits of the food retailer and can not be generalized to other organizations (Yin, 2003). However, they give a good indication of the impact of B2B e-business initiatives on the retail supply chain.

4.2 Traditional internal value chain

‘The value chain displays total value, and consists of value activities and margins. Value activities are the physically and technologically distinct activities a firm performs. … Margin is the difference between total value and the collective cost of performing the value activities’ (Porter, 1985, p.38). In Figure 3, the internal value chain of the food retailer is depicted, which includes the typical business processes a retailer performs. The food retailer’s value activities consists of category management, product design & development, strategic sourcing & price definition, catalogue maintenance, planning & forecasting, procurement & replenishment, logistics & distribution, and store & merchandising. Traditionally, all these activities were performed by the food retailer. The category management process results in customer satisfaction. Customer satisfaction is the feeling that a product or service meets the customer expectations and determines whether a customer will repeat his or her purchases or not (Zeithaml et al., 1993) and can be compared with Porter’s margin.
Within the food retailer, category management is the first step and involves the food retailer / supplier process of ‘managing categories as strategic business units, producing enhanced business results by focusing on delivering customer value’ (Dhar et al., 2001, p.169). It enables the food retailer to systematically manage the products offered to their customers and focuses on optimizing assortments, promotions, and product introductions. It is designed to help the food retailer ‘provide of the right mix of products, at the right price, with the right promotions, at the right time, and at the right place’ (Gruen and Shah, 2000, p.483). The food retailer is organized around categories.

Product design & development within the food retailer is rather sporadic as well before as after the introduction of B2B e-business initiatives and is only related to private label and first price / Derby products. In order to design a product, the food retailer works in conjunction with a supplier. Product design refers to the ingredients and additives these products must contain and the amount of these ingredients and additives. Product development is related to packaging. Written descriptions in product packaging must fulfill three conditions; product packaging must (1) be written in the languages that are obliged by the law (Dutch, French and German), (2) contain product information such as the ingredients used, and (3) be consistent with the food retailer’s image.

With strategic sourcing we refer to the identification and selection of suppliers for a particular product. To introduce a new product and negotiate prices and conditions, the supplier’s sales force traditionally schedules meetings with the food retailer. When the food retailer accepts the product into his assortment, the catalogue must be updated. The supplier sends the product-related information to The food retailer which, in turn, enters this into his systems and adds The food retailer-specific information. Therefore, in order to introduce a product into trade or change product information, The food retailer’s purchasing department manually enters the information with regard to these new or modified products through a mainframe application. In case of a new product, The food retailer’s purchaser bases its case on the supplier’s filing card. Beside the registration in the mainframe, information such as price changes is collected on cardboard filing cards.

Once a product is introduced in the food retailer’s assortment, this product can be ordered from the supplier. In the traditional ordering process, the demand for the product is being forecasted and orders are placed and order quantities are determined by The food retailer based on e.g. promotional pricing. Orders are generally determined on a monthly or weekly basis, certainly not on a daily basis. The purchase orders are placed, printed, and transferred to the supplier by post or fax. Sometimes this process is repeated by phone. To resupply a particular product, a purchase order must be manually generated. Hereby, The food retailer’s purchasing department takes into account the inventory availability, the store orders, and the supplier’s term of delivery. The food retailer manages promotions through a workflow based application. This process starts at The food retailer’s purchasing department with the registration of the promotions and ends with forwarding the advance orders to the supplier.

The food retailer receives and checks the supplier’s shipments, moves the merchandise to the storage area, and if necessary, redistributes them to the local retail stores. For some products, The food retailer follows the technique of cross-docking. In this system, suppliers continuously deliver products to The food retailer’s distribution centers. The products are then transported to cross-docks, often without ever sitting in inventory. Instead of spending valuable time in the distribution center, products just cross from one loading dock to another in 48 hours or less. Cross-docking enables The food retailer to avoid the usual inventory and handling costs. A third possibility is that products are delivered directly from the suppliers to the local retail stores as Direct Store Deliveries (DSD). When the supplier’s invoice is received, it is compared with The food retailer’s original purchase order and the receiving document, called three-way matching (for an example of three-way matching see e.g. Hammer, 1990 where the example of Ford Motor Company’s three-way matching is described). If these three documents match or if the difference is less than x euro, the invoice is paid. Otherwise, the purchaser has to investigate the discrepancy. In this case the invoice is not paid until the problem is solved. When products are on sale in the local retail store, The food retailer provides information and advice to the customers and maintains product displays.
5. **E-BUSINESS INITIATIVES**

The food retailer launched a portfolio of B2B e-business initiatives ranging from private initiatives with some suppliers to joining the World Wide Retail Exchange (WWRE). We will look at some of these B2B e-business functionalities that are used between the food retailer’s distribution center and the suppliers, and the food retailer’s distribution center and the local retail stores and describe their impact on the retail supply chain.

In Figure 4, the prominent B2B e-business initiatives in the value chain of the food retailer are enumerated. The food retailer’s B2B e-business initiatives included are projects under consideration, planned, or being executed, and are related to the relationship between the food retailer and suppliers, or related to an e-marketplace offering. Besides, we have included the logistics & distribution initiative which is related to internal information sharing and the store & merchandising initiatives which are related to the B2C part to complete the picture. The Supply chain Information eXchange (SIX) is a calendar which standardizes and centralizes the supply chain schedules between the retail stores and the distribution center, improving the internal supply chain visibility. To date, The food retailer uses no particular category management initiatives, as can be derived from the picture.
5.1 Virtualization of the food retailer’s business processes

The food retailer has been involved in the development of the Central Data Bank (CDB). The CDB provides a common platform for retailers and suppliers, enabling the electronic sharing of data. It is a central electronic product catalogue that receives and stores neutral master data regarding a trade item from data providers, which are suppliers of branded products, and makes this information available and forwards it to all data acceptors. This implies that the food retailer uses no more paper catalogues with CDB data providers. Instead, the food retailer operates a workflow module in combination with its existing purchase application and has realized an end-to-end integration with the CDB. As a result, the purchase manager does not have to manually enter data when a new product is introduced or an existing product is changed. When using the CDB, the product information in the supplier’s database is aligned with product information from the food retailer. Today, 49 organizations have subscribed to the CDB services, among whom 42 data providers and seven data acceptors. Examples of suppliers...
that participate in the CDB are Campina, Danone, Henkel Belgium, Colgate Palmolive Belgium, and Dr. Oetker (www.eanbelgilux.be). Using the CDB, manual key-in work and rework is eliminated. For items from suppliers joining the CDB, the process of item creation and catalogue maintenance is no longer executed by the food retailer but is moved to these suppliers, as illustrated in Figure 4. Here, support for hypothesis 1 about the virtualization of business processes is provided.

However, not all data are exchanged with the data pool because it does not contain all data or specific data is missing. In these cases, the supplier is invited to complete the missing data through the food retailer’s Supply Chain Net (SCN). SCN is a common trading platform between the food retailer and its trading partners. It is an extranet that provides useful information for suppliers. Today, suppliers can check invoice status, purchase orders, delivery status, promotional planning, benchmarks, and key performance indicators (e.g., stock rotation). Besides, some administrative functions, such as quality control, have been shifted to suppliers via SCN. Further, it is used as a repository for private label and first price / Derby product data which are developed in conjunction with a supplier. SCN allows suppliers to exchange and update product design and specifications from private label and first price / Derby products via the web. Suppliers manage for example the ingredients and additives through SCN. By centralizing all product data, users know where to locate the information and all participants work from the same version. The food retailer uses this already for choc pasta, salmon, milk, and spices. Furthermore, the food retailer uses VMI with suppliers of branded products. VMI is a supply chain management technique in which the food retailer delegates its inventory replenishment decision to the supplier. Ordering has been eliminated. Instead of transferring orders to suppliers, the food retailer offers suppliers information on inventory levels and retail store sales. Every day, the food retailer sends the quantities ordered by the local retail stores and the stock situation in the distribution center per item to the respective supplier. Then, suppliers make supply decisions regarding quantities, timing, and shipping within previously agreed upon bounds. This process is different from the traditional inventory management process, where the food retailer determines the product quantities and places an electronic order for those quantities with the supplier. Hence, when using VMI, the food retailer moves the procurement and inbound logistics decisions to the suppliers (cf. Lee et al., 2003; Kaipia and Tanskanen, 2003). In other words, the order generation and replenishment function is ‘outsourced’, as depicted in Figure 4. VMI is primarily used by the food retailer with suppliers from home & beauty care products. A VMI system is found for example in the relationship between the food retailer and L’Oréal. The VMI system allows to efficiently managing the complexity of the vendor’s assortment offered by the retailer. Besides, the food retailer adopted VMI with Kraft for managing the fresh cheese inventory.

A similar initiative is called Continuous Planning, Forecasting, and Replenishment (CPFR). With CPFR, the food retailer and its suppliers share forecast and planning information over the internet. It begins with an agreement between the supplier and the food retailer to develop a jointly owned plan. This plan describes for example what is going to be sold and how it will be promoted. It becomes the input to the forecast. The goal is to replenish based on consumer demand. The food retailer has already conducted a CPFR pilot with a limited number of branded product suppliers. In the near future however, CPFR partnerships will probably be eliminated. VMI allows the food retailer to work very efficiently and the added value that the food retailer can realize by using CPFR is minimally compared with the additional resources needed. With VMI and CPFR the supplier generates the purchase order, and thus the purchasing department is relieved of the planning, forecasting, purchasing, and replenishment function.

Hypothesis 1 suggests that for retailers that use B2B e-business initiatives, business processes are virtualized. When using the CDB, SCN, VMI, or CPFR, some tasks, formerly executed by the food retailer, are now performed by their suppliers, as illustrated in Figure 1. Therefore, we conclude that for some suppliers and for some products, some parts of the food retailer’s business processes are outsourced or virtualized. Hence, hypothesis 1 is supported. However, the scope of outsourcing activities is confined to information exchange and supply decisions regarding order quantities, shipping, and timing. While information exchange is outsourced to branded as well as non-branded product suppliers, supply chain decisions are only moved to branded product suppliers. Usually, only capabilities such as information exchange, warehousing, transportation, and inventory management are outsourced to supply chain partners, mostly suppliers. This result is also consistent with van Hoek’s (1999) findings. He conducted
interviews with managers of food, electronics, automotive, and clothing manufacturers in The Netherlands, Belgium, and Germany and came to the conclusion that in food supply chains outsourcing is applied to a lesser extent than in other industries (van Hoek, 1999). Moreover, the outsourcing scope is limited to warehousing and shipment. In contrast, Kaipia and Tanskanen (2003) give the example of a retailer that has outsourced ‘such tasks as the whole process of category management, including assortment decisions for different customer retail chains and shelf layout planning; ordering, replenishment and shelf work at the store’ for a non-core product category, in particular the paper and office products category (Kaipia and Tanskanen, 2003, p.170) and with it introduce the concept of vendor managed category management, a combination of ideas of VMI, category management, and outsourcing.

5.2 Retailer-supplier relationships: market or relational exchange?

In hypothesis 2, it is predicted that in some cases, retailers engaging in B2B e-business initiatives, will choose the market exchange and with it increase the number of suppliers they consider. In our case, there is evidence that B2B e-business initiatives such as reverse auctions and purchasing groups support the market mechanism. Reverse auctions may be considered a tool for the strategic sourcing process and is used to negotiate with suppliers, as depicted in Figure 4. Reverse auctions are primarily used by the food retailer to procure private label products and first price / Derby products. It is primarily standardized products and the volume of these products the food retailer needs, allows for reverse auctions. The online reverse auction process begins with the identification of the product specifications and the identification and qualification of potential suppliers. The product descriptions need to be accurate and complete. Product specifications for tuna fish are an example. The food retailer can specify for instance which type of oil should be used, how big the tuna fish pieces should be minimally or maximally, the height of the can, and if the can should be labeled or delivered without label. These requirements are then posted on an electronic auction tool provided by the WWRE and qualified suppliers place bids. The food retailer chooses the supplier with the lowest cost. Consequently, the product of this supplier is examined in the laboratory of the food retailer to investigate if all requirements, specified in advance, are met. If this is the case, the supply contract is awarded and the supplier may fulfill the order. The food retailer has already undertaken reverse auctions for direct goods such as canned fish, oil, dressing, canned fruit, and bread. Besides, indirect goods such as plastic bags and wrapping equipment are purchased through reverse auctions. So far as indirect goods are concerned, reverse auctions can be used for the food retailer group purchases or for aggregated purchases together with other WWRE members such as Ahold and Tesco. Aggregated auctions enlarge volumes and thus increase potential for discounts and better conditions. Finally, for particular, difficult product categories, for instance desktops, the WWRE qualifies through visits a list of viable suppliers.

Using reverse auctions, the food retailer attempts to minimize the price paid as long as minimum specified quality is met. Further, reverse auctions result in time savings in the negotiation process because of a reduction in time spent communicating with vendors and improved negotiation tracking and contract control. The WWRE offers value-added services by offering the tool to do reverse auctions, creating a community for indirect products, and qualifying suppliers for particular categories.

Primarily price guides the transaction. Because the food retailer’s purchase decision is based on the lowest price, as long as requirements are met, no long-term incentives exist and hence no relationship-specific investments are done by the food retailer or the supplier. It is a one-time transaction and the food retailer uses a reverse auction for the next purchase decision. Reverse auctions are used to award short-term contracts to suppliers. The supplier is unknown until the end of the bidding process. Most of these products are easily measured commodities that can be produced in Europe as well as in Asia or America. The information exchanged is limited to the transaction. Hence, B2B reverse auctions answer our description of market exchanges, i.e. it is about a discrete transaction, with a short term focus, for basic products, where price is important and therefore we refer to reverse auctions as an example of the internet-enabled market exchange. Also Garcia-Dastugue and Lambert (2003) are of the same opinion. ‘When a reverse auction is used, the supplier can be different every time an auction is held. The resulting relationship is focused on the one-time transaction’ (Garcia-Dastugue and
Lambert, 2003, p.262). Similarly, Jap and Mohr (2002) recognize that reverse auctions can harm relational exchanges because they focus only on price differences between suppliers and do not take into account non-economic benefits such as quality and value-added services (Jap and Mohr, 2002). Following Jap (2003), we believe that ‘… such auctions are ideally suited for transactional exchange contexts but may be less appropriate for relational exchanges’ (Jap, 2003, p.97).

Besides, the food retailer Europe is member of the European Marketing Distribution (EMD; www.emd-ag.com), an international central purchasing and marketing organization or cross-border buying alliance. Firstly, the EMD increases retailers’ negotiation power vis-à-vis suppliers of branded products. EMD members, including The food retailer, pool their individual purchasing volumes and let the group negotiate on their behalf. By combining the purchases, these retailers can gain greater leverage over national brand suppliers, obtaining better conditions than they would have acquired individually. Although conditions are negotiated through EMD, retailers continue to purchase these branded products locally. Secondly, members collaborate on the sourcing of first price products. EMD develops Euro-labels, which the food retailer calls first price products, in accordance with manufacturers that are available for use by all members. International tendering and centralized purchasing implies price advantages. Examples of such products offered by the food retailer are Breakfast Club Cereals, Premier Cola soft drinks, and Powerking Energy Drink.

Like reverse auctions, EMD supports mainly the market mechanism. As well for branded as for non-branded products bought through EMD, obtaining better conditions is a key goal for the food retailer. Analogously, Garcia-Dastugue and Lambert (2003) view a purchasing group as an example of the market mechanism. ‘In purchasing groups, complexity of product description needs to be medium to low. The product does not have to be a commodity, but its features and quality have to be easy to assess. No specific assets are needed for joining a purchasing group. Transaction risk is low because using a purchasing group is similar to a one-time transaction and no barrier restricts a firm’s management from purchasing independently from the group. The firm is not ‘locked in’ the relationship with suppliers nor with the management of the group itself. … Operational performance risk is as high as conducting a one-time transaction because the group management may decide, for instance, to change suppliers without notice. … Low to medium frequency is appropriate for using a purchasing group. Medium value items, such as computers, fit well with purchasing groups’ (Garcia-Dastugue and Lambert, 2003, p.257).

A mere relational application when compared to reverse auctions is Electronic Data Interchange (EDI). When using EDI, the food retailer offers its suppliers two techniques. EDI messages can be sent through either an approved network or through the internet. Typically, with traditional EDI, existing trading partners transfer business documents over an IBM Value-Added Network (VAN) using an agreed upon EDI standard. This way of working is only interesting for large suppliers with which a lot of messages are exchanged because they should be connected to a VAN-operator and communication and translation software on the computer of the supplier is required. The food retailer used classic EDI by a VAN with 170 major suppliers during the last 15 years. With the rise of the internet as a B2B communications tool, conducting EDI over the internet, which the food retailer calls web-EDI, offers a less expensive alternative. Web-EDI is a more modern way of EDI-communication where no software is required on the computer of the supplier. This software is placed on a central internet server. The management of this software will be kept locally without implications for the end user. Using an internet browser, the supplier can connect himself to a website where the food retailer delivers his orders for the supplier. 800 suppliers use web-EDI to communicate with the food retailer. Traditional EDI, which is not based on internet technology, responds more to the characteristics of relational exchange than web-EDI. The web allows the food retailer to exchange information with suppliers without making large, sometimes specific investments in proprietary systems as is the case with traditional EDI. Internet offers the opportunity to ‘de-specify’ assets while providing the same functionality as traditional EDI but at a lower cost.

A collaborative initiative is a VMI system. As described above, a VMI system is a pull inventory system and supports daily supply of goods between the supplier and the food retailer based on automated exchange of information about inventory levels in the distribution center and retail store sales within the framework of an agreed supply policy. Hence, more confidential information is shared with the supplier. Using VMI, the food retailer focuses not so much on price but rather on optimization. Further, the food retailer is dependent on the
supplier for shipments and mutual dependence of firms on each other is a partnership characteristic. This finding is also consistent with the results from Lee et al. (2003). ‘The perceived differences in interdependence with and without collaboration (i.e. VMI) provide strong support for the statement that collaborative B2B commerce (i.e. VMI) increases both retailer dependence on manufacturers and functional interdependence within the channel by tightly coupling inter-firm operations’ (Lee et al., 2003, p.358).

With VMI, the supplier has the incentive to move to the food retailer as much inventory as is allowed. To overcome this drawback, mutually agreed upon performance targets for the food retailer-supplier relationship are set. If the supplier stuffs the food retailer’s distribution center with its merchandise, the food retailer is permitted to return excess goods to the supplier. When a VMI system is implemented, the purchasing decision has usually been made. The relationship is close and long-term focused. Nevertheless, if a supplier frequently scores poorly on the performance measures, the food retailer can decide to stop using VMI with that particular supplier.

The characteristics of a VMI system between the food retailer and a particular supplier, namely exchange of confidential information, interdependence, long-term focus, and non-price focus, are in accordance with these of retailer-supplier partnerships. VMI involves a collaborative, partner-like relationship between the food retailer and the participating suppliers and therefore, a VMI system can be regarded as a the food retailer-supplier partnership. The literature broadly supports this viewpoint. Waller et al. (1999) do not talk about a VMI system but a VMI partnership and Tyand Wee (2003) state that ‘VMI represents the highest level of partnership where the vendor is the primary decision-maker in order placement and inventory control’ (Tyand Wee, 2003, p.12). In line of this, Lee et al. (2003) state that a vendor managed inventory program can be regarded as new collaborative B2B e-commerce. To summarize, VMI partnerships can be described as long-term retailer-supplier partnerships. They support an ongoing relationship between the food retailer and the supplier that involves sharing of information.

In hypothesis 3, we argue that in some cases, retailers engaging in B2B e-business initiatives will choose long-term retailer-supplier partnerships with a select group of suppliers. As described above, support for hypothesis 3 is provided, and hence hypothesis 3 can be accepted.

In conclusion, different types of exchange as well market as relational exist between the food retailer and its suppliers dependent on the product they supply. B2B e-business initiatives support the market exchange, such as reverse auctions and EMD, as well as the relational exchange, with VMI partnerships. Web-EDI lies somewhere in between and has characteristics from transactional as well as relational exchange. This strategy is in accordance with the viewpoint of for example Burton (1995), Dyer et al. (1998), and Bensaou (1999) who state that organizations should not use a ‘one-size-fits-all’ strategy for procurement, but manage a ‘portfolio of buyer-supplier relationships’. Thus, while the food retailer is using B2B e-business initiatives such as VMI for more collaboration through information sharing, in some procurement situations, more sources of supply are identified when using reverse auctions and EMD.

Table 1 gives an overview of the characteristics of both the transactional and the relational exchange and the food retailer’s B2B e-business initiatives that correspond with these characteristics.

<table>
<thead>
<tr>
<th>Relationship type</th>
<th>Transactional exchange</th>
<th>Relational exchange</th>
</tr>
</thead>
<tbody>
<tr>
<td>The food retailer-supplier relationship characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>discrete transactions</td>
<td>close relationship</td>
<td></td>
</tr>
<tr>
<td>short-term orientation</td>
<td>long-term orientation</td>
<td></td>
</tr>
<tr>
<td>basic products</td>
<td>core products</td>
<td></td>
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<tr>
<td>price focus</td>
<td>optimization</td>
<td></td>
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<tr>
<td>information limited to the transaction</td>
<td>confidential information</td>
<td></td>
</tr>
<tr>
<td>small investments by both The food retailer and supplier</td>
<td>large investments by both The food retailer and supplier</td>
<td></td>
</tr>
</tbody>
</table>
conflicting The food retailer-supplier relationship advantages for both The food retailer and supplier / collaboration / win-win situation

examples: reverse auctions, EMD examples: VMI
examples: Web-EDI

5.3 Intermediaries and retailer’s retail supply chain

A food broker is an organization that serves as a conduit between the supplier of a product and the food retailer (based on definition from Mudambi and Aggarwal, 2003). Traditionally, brands from organizations that have no commercial structure in Belgium are represented by such food brokers. Those food brokers are responsible for trading with the food retailer. An example of such a broker in Belgium is Pietercil Resta who is responsible for products from for example Barilla. However, supplier’s use of a food broker is limited, certainly in Belgium. Hypothesis 4 proposes that B2B e-business initiatives eliminate such traditional intermediaries in the retail supply chain. However, with the emergence of the internet and B2B e-business initiatives, food brokers do not disappear. The food broker remains visiting the food retailer on the average once a month. Face-to-face contact is still required, because during these meetings information is exchanged that would never be exchanged using B2B e-business initiatives or even never be written down such as supplier’s conditions. Hence, hypothesis 4 is not supported and must therefore be rejected.

The ‘threatened intermediaries hypothesis’ suggests that it is likely that intermediary organizations will play an important role in developing electronic marketplaces (Sarkar et al., 1995; Sarkar et al., 1998). Similarly, Bailey and Bakos (1997) expect that ‘while some of the traditional roles of intermediaries may become less important as information technology facilitates communication between customers and suppliers, the need for intermediaries is not likely to be eliminated in the near future. Intermediaries in electronic markets are likely to assume important roles that will include aggregating information goods, providing trust relationships and ensuring the integrity of the market, matching customers and suppliers, and providing marketing information to suppliers’ (Bakos and Bailey, 1997, p.18). Also in our case, there was evidence that food brokers between the food retailer and the supplier for whose products the broker is responsible, do not disappear with the emergence of B2B e-business initiatives. They stay in the retail supply chain and have still important tasks to fulfill. Moreover, they add value for the supplier and the food retailer. This result is also consistent with the finding of Mudambi and Aggarwal (2003). They examine the position of the industrial distributor in the new economy and come to the conclusion that ‘if distributors are to survive in the new economy, they need to add value for their suppliers, and also for their customers’ (Mudambi and Aggarwal, 2003, p.322).

Hypothesis 5 suggests that B2B e-business initiatives create opportunities for new intermediaries in the retail supply chain. The food retailer is a member of the world wide retail exchange. The WWRE is an internet-based B2B retail e-marketplace. It was founded in March 2000 by 17 international retailers, including Casino, Gap, Kmart, Marks & Spencer, and Tesco. It enables web-based transactions among retailers and suppliers operating in food, general merchandise, textile/home, and drugstore sectors. Today, the WWRE counts 64 members from around the world. It provides a communications platform and related services through which retailers and suppliers can establish an electronic marketplace for the purchase and sale of goods and services. The WWRE operates as an open, independently managed organization and plays an intermediary role between the retailers and suppliers. Therefore, we view the WWRE as a ‘new’ intermediary in the retail industry. This new ‘virtual’ intermediary is represented by a website (www.wwre.com) on the internet where the suppliers and retailers meet. This is consistent with the viewpoint of Segev et al. (1999) who state that internet-based marketplaces assume an intermediary role between participants of different industries (Segev et al., 1999). Also Le (2002) notes that e-marketplaces act as intermediary between multiple buyers and sellers (Le, 2002).

The WWRE offers several purchasing tools that are used by the food retailer such as reverse auctions, catalogues, promotion portal and CPFR. Reverse auctions and CPFR are described above. To optimize the promotional
planning, the food retailer collaborates more and more with its suppliers, resulting in better forecasts of expected sales. To manage promotions, the food retailer offers its suppliers three possibilities, namely CPFR, Promotion Portal (CPFR and promotion portal both via the WWRE; only for larger suppliers because of costs connected with the use of this e-marketplace), and SCN. Web based applications facilitate this collaboration.

‘E-procurement is a technology solution that facilitates corporate buying using the internet’ (Presutti Jr., 2003). Using e-procurement, the food retailer allows its employees to order directly from an internal online catalog that integrates all available Maintenance, Repair, and Operations (MRO) supplies such as a mobile phone, a laptop, and a desktop from approved vendors. Employees, who have a need for an indirect item, can purchase that item from the catalog in accordance with company buying rules. When an employee selects a particular good for purchase from such a supplier catalog, the information with regard to this purchase is automatically routed through the necessary approval processes. Once approved, the order is sent to the supplier via automatic fax, mail, or EDI dependent on the supplier. E-procurement streamlines the procurement of indirect goods and enforces use of contracts incorporated into the catalog, solving the problem of ‘maverick’ or off-contract purchasing. Furthermore, it enables aggregation of purchases within the food retailer group and jointly with other WWRE members, enabling the achievement of aggregated buying benefits and improving conditions.

6. CONCLUSION

Based on the literature review, propositions regarding the impact of B2B e-business initiatives on the retail supply chain have been developed. These propositions are tested with the case study method. From our findings, several implications for the retail supply chain can be derived. First, we can conclude from Figure 4 that for the food retailer, B2B e-business initiatives are primarily related to the procurement processes, i.e. strategic sourcing & price definition, planning & forecasting, and purchasing & replenishment. Further, when considering the food retailer case, we can find some activities, that were previously performed by the food retailer and that are now executed by another supply chain member, in our case the supplier. However, this is related to a limited number of activities such as information exchange and order generation. Third, both the market and the relational exchange approach are used, dependent on the product that is sourced. Retailers primarily focus on relational exchange efforts when branded products are involved and usually revert to the market exchange when low price items are being purchased. Furthermore, the research reveals that traditional intermediaries are not disintermediated from the food retailer’s retail supply chain due to the emergence of B2B e-business initiatives. However, a new intermediary, in the form of the WWRE, participates in the retail supply chain. It occupies a neutral, intermediary position between retailers and suppliers and provides services to both parties.

7. FURTHER RESEARCH

In this paper, the impact of B2B e-business initiatives on the retail supply chain is described. This description has been derived from the literature and has been empirically tested with the food retailer case. However, further research is required. In the future this study could first be expanded to other (food) retailers. Further testing of the propositions in other (food) retailers will increase external validity. Secondly, future studies which examine the impact of B2B e-business initiatives on the retail supply chain can also consider other aspects in order to better understand the impact.

8. REFERENCES


