Sectoral Innovation Foresight
Future Innovation Challenges in the Retail and Wholesale Sector

Interim Report

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1 Introduction

This interim report is part of Task 2 (Sectoral Innovation Foresight) of the Europe INNOVA Sectoral Innovation Watch (SIW) project. It presents interim findings on possible future developments in the sector under study. Particular emphasis is put on the one hand on future changes that are likely to significantly influence the evolution and emergence of innovation activities and associated markets, and on developments that are likely to be of cross-sectoral relevance to innovation on the other. Sectoral innovation foresight thus complements Task 1 of the SIW project, which analyzes current sectoral innovation performance.

The main objectives of Task 2 can be summarised as follows:

- Explore and identify the main drivers of change in the nine sectors. These drivers will be both internal and external to the sectors, with several of them being of a cross-cutting nature.
- Identify and assess key future developments in the nine sectors as well as in terms of cross-cutting developments. The emphasis is put on likely future innovation themes and emerging markets, more specifically also on the requirements and impacts they raise in terms of skills requirements, organisational, institutional and structural changes in the sectors concerned.
- Develop scenario sketches for the sectors under study.
- Highlight key policy issues for the future, with a view to enhancing the innovation performance and competitiveness of firms operating in these sectors.
- Stimulate debate and contribute to the creation of expert networks, based on the participatory elements of this task.

The time horizon of these foresight papers is five to ten years (2015-2020), depending on the specific characteristics and the pace of change in the respective sectors. Wholesale and retail trade being a service sector, the innovation patterns differ in many respects from those of other industrial sectors. The time horizon of up to ten years, however, seems to be well suited to capture important upcoming changes in the sector.

This Interim Report is based on a review of available foresight material on the wholesale and retail trade sector. Together with the corresponding report on the eight other sectors addressed by the SIW project (aeronautics and space, automotive, biotechnology, construction, food and beverage, knowledge-intensive business services, wholesale and retail trade), it serves as background material for a first expert and stakeholder workshop (June 2009). The report concentrates on drivers and innovation themes, but provides already some first findings and thoughts on emerging markets, requirements and future scenarios, i.e. as far as these issues can be derived from the review work. The first workshop aims on the one hand at reviewing the interim findings and on the other at exploring future scenarios of the sector in an interactive mode. The results of this first workshop and some further interviews with experts and stakeholders will then be incorporated in a draft final report that will serve as input to a second foresight workshop (November 2009). This second workshop will focus on the main policy issues that arise from the exploratory scenarios, both within the individual sectors and at their intersection. The final report will bring together in a consistent form the results generated in the different phases of the foresight exercise, i.e. will be based on revised and amended versions of the initial chapters of this interim report and additional chapters dealing with refined scenarios, future requirements and policy issues.

The interim results are presented in six chapters, starting with a situational analysis where the sector stands today to contextualize possible future developments (Chapter 2). Building on this context, Science & Technology (S&T) and demand drivers will be outlined (Chapter 3), as a basis for discussing emerging innovation themes (Chapter 4). These are expected developments resulting from the interaction of supply (technological advances) and demand (societal / customer needs) forces. In this chapter, implications of these innovation themes at firm level will also be addressed. Institutional and structural requirements and implications of the innovation themes for the sector will be highlighted in Chapter 5. This is complemented with first scenario sketches (Chapter 6) and some key questions to be addressed in the remainder of the Sectoral Innovation foresight task (Chapter 7).
2 Current situation

Retail covers the resale without transformation of new and used goods to the general public for personal or household use and consumption (Eurostat 2009: 104). Various distinctions can be made; for example between non-specialized and specialized retailers; between food and non-food retailers, between in-store and other retailers (e.g. markets, door-to-door, remote); and between new and second hand goods. According to Eurostat, wholesale is a form of trade in which goods are purchased and stored in large quantities and sold, in batches of a designated quantity, to resellers, professional users or groups, but not to final consumers.” Further details of the NACE definition can be found in the Annex.

From a historic perspective, retail, for example in food, has gone through four stages (according to Bell 2000): The consumer co-ops were organized on a regional basis within a country. In order to increase their buying power, retailers have established chains and in the long run were able to gain large market shares. In a second phase, large retail formats emerged across Europe, initially in Belgium, followed by France, Spain, Portugal and the UK. Large surface resulted in a crowding out of small neighborhood stores and in the decline of downtown supermarkets. Phase three is characterized by advanced distribution systems by the large integrated retailers. Introduction of the scanning system provided the necessary information to reverse the supply chain from ‘producer push’ to ‘consumer pull’. As a consequence the number of traditional wholesalers declined, in the end at the expense of small retailers. Finally, in phase four, we see the emergence of retail chains as national brands in their own right, moving away from head-to-head price competition to a differentiation strategy based on availability, service, store format and location.

Key figures and market organisation

Average annual growth rate of turnover for wholesale trade in the EU-27 from 2002-2007 was a little over 6% (almost as much as transport/communication and computer services/other business which are on top of the service statistics). The figures for retail are lower: ca. 3.6%. (Eurostat 2009, see table 1).

Retail trade has a particular importance for economic statistics because of its role as an interface between producers and final customers. This allows retail sales turnover and volume of sales indices to be used as a short-term indicator for final domestic demand by households. Eurostat makes a distinction between retail turnover in value and volume. Volume statistics eliminate price effects. Figure 1 shows a continuous increase in volume of sales over the last ten years (Eurostat 2009).

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Table 1: Annual growth rates for the volume of sales index, retail trade (%)

(1) Working day adjusted series.
Source: Eurostat (eicn ts ret)
As Eurostat figures of 2008 show, wholesale and retail are among the most important sectors in terms of share of value added and employment in the EU27. More than 13% of the employees in the EU work in retail. In wholesale, the share is about 8% (see figure 2).

In retail, micro enterprises play a particularly important role. They are defined as employing less than ten people. In retail, such enterprises account for the majority of companies. They provide employment to nearly as many persons as large enterprises. The figure below shows that in retail, most value added is generated by large enterprises (about 35%) and followed by micro enterprises (about 30%). This is a very high figure compared to the other sectors shown in the statistics (figure 3). Not so long ago, only in 1990, there were no retailers among the Fortune 500 largest global companies. Ten years later there were over 50, and in 2002 Wal-Mart became the largest of all companies (by size of sales). In only two years, between 1996 an 1998 retailer’s share of revenues among the top Fortune 500 grew by over 25% and their share of total assets doubled (Gestrin 2000, Reynolds 2004). These figures show that there is an enormous concentration process going – at the expense of the small and micro retailers.

Value added in wholesale is more evenly distributed among the four size categories of enterprises which is also very unusual for the other sectors where large enterprises usually dominate (Eurostat 2009).
Labor productivity in retail and wholesale is rather on the low side, especially in micro enterprises. This is shown in figure 4. These findings give already account of one of the major drivers of the sector. Especially in retail there is a lot of pressure on costs, leading to larger and more efficient sizes of enterprises whereas micro business can only survive if they are maintained by a family and/or where working hours do not cause high costs (Eurostat 2009).
Figures from 2004 show that the distribution and trade sector accounted for approximately 6 million enterprises in the EU15. The commerce sector generated a total turnover of €7,140 billion in the same year. Labour statistics from 2006 show that the commerce sector provided 33.3 million jobs, of which 80% were located in the EU15. Employment in the commerce sector grew with 2.4% annually in the period 2000-2004 in EU15. The value added for the distribution and trade sector amounted to EUR 1,352 billion in 2006 (van der Giessen et al. 2009).

Retail is the biggest sub-sector in terms of firms (60%) and employment (55%), but the wholesale sub-sector is the biggest in terms of turnover (55%) and value added (46%). Almost half of all firms in the retail sector were small or micro firms, with less than 50 employees. Distribution and trade is a low-pay sector, with substantially lower wages than in the manufacturing sectors. Moreover, women earn 20 to 30% less than men. In the commerce sector 33% of the employees work as a service worker, followed by clerks (13%) and managers of SMEs (11%). The share of service workers reached even 47% in the new Member States (van der Giessen et al. 2009).

Current Situation in Wholesale

The wholesale sub-sector accounted for 1.7 million enterprises in 2004, which is a share of 27.2% of the total number of firms in the commerce sector. Statistics from 2006 show that there were 10.4 million jobs in this sub-sector (31.1% of the total number of jobs in the commerce sector). Employment in the wholesale grew with 2.1% annually in the period 2000-2006. The wholesale sector employed 9.72 million people in 2006, of which 86% were employees and 14% were entrepreneurs. The share of part-time jobs amounted to 10%. Men represented two-thirds of the workforce in wholesale and more than half of the persons employed were aged between 30 and 49. The wage adjusted labour productivity for wholesale sector amounted to 157.6%, which is higher than the non-financial business economy average (van der Giessen et al. 2009).

Current Situation in Retail

The retail sub-sector accounted for 3.7 million enterprises in 2004, which equals 60.2% of the total number of firms. In 2006, there were 18.5 million jobs in the retail sectors, so 85% more than in wholesale (55.4% of the total number of jobs in the sector). Employment in the retail grew with 2.3% annually in the period 2000-2006. The retail sector employed 17.14 million people in 2005.
Europe Innova Sector Innovation Watch

(almost twice as much a in wholesale), of which 79% were employees and 21% were entrepreneurs. The share of part-time jobs amounted to 30%. The sector has a high share of women employed (62%) (van der Giessen et al. 2009).

One of the key drivers is the cutting of personnel costs, mainly by increasing labour flexibility. The sector has a relatively young workforce with 30% aged between 15 and 29 and half of the employees aged between 30 and 49. Nevertheless, the workforce is ageing. Retail has a relatively low trade union density. There is a strong social dialogue between social partners, although there are several large-scale retailers that resist to social dialogue. Important issues are deregulation, opening hours, labour flexibility, and gender inequality (van der Giessen et al. 2009).

Even though retail experienced some growth rate mainly due to the expansion in the new accession states, in other countries as in Germany the business has been declining during the recent years. The number of actors in some of the bigger and "old" EU countries has been diminished and the number of bankruptcies has increased (Pietersen 2004, 54).

In the Eastern European states the development of the retail sector was quite different. These countries have seen 50 years retail development in just 15 years. The retail business has experienced an unprecedented growth in this region as consumers had a strong longing to catch up with consumption of the West (KPMG 2006: 3).
3 Drivers of innovation and change

In the retail sector there are a few but dominant drivers from the past that still affect the present and will affect the future even though with lesser impact. First of all there is the liberalization of the European market and second the globalization, accelerated by ICT. The effects of globalization on retail are, for example, concentration/consolidation, differentiation of goods and services, acceleration (Pietersen 2004). These serve also as innovation themes, that will be taken up in chapter 3.

Some form of stagnation was visible long before the financial crisis (of 2008/2009) and the retail business responded to that with new strategies. So, stagnation might not classify as a “driver”, but definitely as a crucial variable. Stagnation affects first of all luxury goods in non-food sales (clothes, jewelry/watches, furniture, cars, consumer electronics). Internationalisation took place mostly on the purchase side; on the sales side the business is still very regionally structured, despite hypermarkets, an increase in internet sales (B2B) and mail order selling (Lademann 2004, 77). Exceptions are books, software and sound carriers. Especially in rural areas consumers make more use of those two features (in German rural areas account for 15% as compared to 2-3% in urban areas).

One special driver the retail sector has is its close relation to the customer. Especially since retailers have started to collect and analyse customer data systematically they have been in a strategic position to develop and place their products and services in order to match customer demand. On rather saturated retail markets, the key to success lies in understanding the customer’s desires and motivation. Thus, data-based retailing, for the most part relying on efficient customer relation management, will provide retailers with the necessary information and provide for adequate customer orientation. While product assortment, store designs or store location can easily be copied by competitors, knowledge about the customer is going to be the key asset of successful retailers (Körber 2004).

Concerning wholesale, the competitive environment is increasingly becoming complex and internationalised. Wholesale is threatened both from the side of the producers by opening their own stores and selling through the Internet and from the side of the retailers by doing business directly with the producers and entering the market for professional users (van der Giessen et al. 2009).

3.1 S&T drivers

Science and technology innovations in the retail and wholesale sector are for the most part driven by the latest developments in ICT. This is why the role of internet and Web 2.0 is very important: it leads to disintermediation by eliminating wholesalers, but also retailers. At the same time there is a reverse trend of re-intermediation adding new players to the value chain (e.g. infomediaries) (van der Giessen et al. 2009).

As van der Giessen et al. state, ICT has influenced the commerce sector drastically at many different levels and the commerce sector belongs to the largest investors in ICT equipment. On the one hand. The introduction of ICT features in the wholesale and retail sector has changed daily operations, marketing, customer relations and retail channels. Principally, the introduction of these features has made retail and wholesale more efficient, responding in part to the strong pressure to cut costs, but at the same time accelerating this trend.
One channel of distribution is, of course, e-commerce, with a very significant influence on customer relations. Experts think that ICT is the key for further development (van der Giessen et al. 2009). E-commerce includes B2C (business to customer), B2B (business to business) and C2C (customer to customer, e.g. ebay).

A further IT-based innovation is radio frequency identification technology (RFID).

**Box 1: RFID**

RFID is a sensor technology historically applied in aviation and container logistics. RFID consists of a tiny computer chip with an antenna. In retail these chips are attached to logistic units, retail units or individual products, e.g. by using adhesive labels. The chip stores a special number, the EPC: Electronic Product Code. The EPC is linked to information in a database such as manufacturers, chipping date, price, weight, expiration date. Authorized users can read this information using a certain software application and a computer-like reading device.

RFID makes it possible to pinpoint the exact location of goods. RFID readers can register EPC automatically, without the need for optical contact. The reader generates an electromagnetic field which is received by the antenna and activates the chip. “Companies that use internationally accepted standards are able to speed up their business processes, thereby saving time and costs.” (Metro Group 2009: 14) Thus, it comes as no surprise that retailers and manufacturers are cooperating to develop uniform standards, regulations and to establish these on the market.

Retail insiders believe that in the future, RFID will enable the retail sector to precisely document the route taken by deliveries: in the “intranet of goods”. This is a company’s intranet to which participating industry partners are connected to call up product and process related data on goods tagged with responders. “Every time a shipment is registered by an RFID reader at any point along the supply chain, the relevant entry is automatically updated in the database. This enables authorized users to determine at any time where goods are located, what stocks are still available and which articles have already been sold. This knowledge can be used to further optimize their processes.” (Metro Group 2009: 14)

Proponents of RFID use in retail state that greater process efficiency can be attained with this technology. Customers can rely that the product they are looking for will always be in stock. The retailer’s IT system generates a warning in case a product should run low so that the manager can order new goods in time. In addition, RFID makes many other innovations in services possible, e.g. retrieving information on a product such as its expiration date, place of origin, ingredients, information on food allergies or incompatibilities. Concerning the supply chain, RFID allows the retail companies to trace the route of goods deliveries, tracing the current location of a good at any time. RFID makes it possible to know when a shipment leaves the manufacturer’s warehouse and when it is going to arrive in the store. Labor intensive manual stocking is not necessary any more as stock can be counted by just pushing a button. Warehouse capacity can be used more efficiently and shortfalls can be avoided. The increased availability of goods might also generate higher sales and market shares in the long run. RFID also prevents theft and helps control the expiration date especially of foods. RFID applied in the supply chain can help avoid supply bottlenecks at manufacturers and retailers, manage their capacities more efficiently and reduce delivery errors. Warehouse costs can be saved as manufacturers are able to respond to demand in a just-in-time fashion. Since every item can principally have an RFID the recall of defect products is much easier. And it is possible to detect where defect parts of a product come from when they are tagged individually before leaving the warehouse.
Box 2: RFID used at Metro store in Germany

The German Metro Group started deploying RFID for its supply chain as one of the first retailers in 2004 and has some ongoing research projects and actual sites that serve as a test bed to optimize this technology. By the end of 2008, Metro Group had introduced RFID in some 400 locations throughout Europe, most of them the Real hypermarkets that belong to the company. RFID is not only tagged to the products but RFID readers are also integrated in forklifts so that the dispatcher always knows that he is getting the goods he is looking for. RFID have been tested successfully in Metro deep-freeze warehouses so that special foods can be labeled as well.

In its research projects Metro Group cooperates with more than 90 companies from the consumer goods industry, IT and service sectors, as well as with academic partners. Jewel in the crown is the Metro Group Future Store in Toenisvorst, Germany, labeled as the “hypermarket of tomorrow”. The partners cooperating in this initiative and test bed are researching for retail innovations, including RFID-based “Smart Quality Assurance” under real-life conditions.

Detailed inventory control is guaranteed at the portal where incoming deliveries are checked automatically using RFID, not just at pallet level but also at case level.

At another store, Galleria Kaufhof in Essen, Germany, all of the items in the men’s fashion department have been tagged with RFIDs. In so called smart dressing rooms, shelves and mirrors provide customers with additional information about the item they have chosen, such as the materials used and care instructions. Suggestions of additional accessories and combinations with other cloths are displayed as well.

Concerns on privacy are taken care of, says Metro Group. The smart chips at Metro do not store any personal customer information. The EPC is linked solely to product and process information stored in the databases and accessible only to authorized users. The company states that all products and packaging featuring transponders are clearly labeled. Besides, they are working on a customer-friendly solution. A gadget called “De-Activator”, for example, is the first one of its kind permanently deactivating RFIDs in its data storage and transmission function.

3.2 Demand-side drivers and emerging markets

The retail and wholesale value chains have changed considerably over the past 20 years. And so has the customer. The commerce sector has transformed into a buyer-driven sector. Mass consumption is substituted by mass customisation and tailor-made sales and services. Consumers have individual wishes and needs. The further segmentation of the markets also addresses the specific needs of the ageing population. Supported by the application of ICT tools, retailers will know more about their customers and may build up close relations with them. Based on this information and the close relations, retailers are able to make offerings tailored to the individual needs of the customer (van der Giessen et al. 2009).

Changes in the income per capita and household are an important driver on the demand side. The more people earn, the more they can spend on consumer goods. It will also work the other way around which we can already see as a result of the financial crisis – especially in the Eastern EU member states. Lifestyle differentiation, desires for personal self-fulfillment and acknowledgment are important determinants for the retail sector as well. Desires for prosperity and consumption go hand in hand with an increased focus on quality of life and well-being. Customers will look more and more for experiences. But this attention for quality of life could also lead to more demand for sustainable and environmentally friendly products.
Consumer wages in the CEE varied to a large extent as figures from 2005 show. Whereas the Bulgarian average was below 200US$ compared to 800US$ in the Czech Republic and Hungary and 1,000 US$ in Slovenia (KPMG 2006: 9). While income slightly increased, so did the access to credit. Consumers turned more towards durable goods purchase, including cars and homes. With the credit crunch, however, consumption might experience a radical turnaround and it is hard to predict what this will mean for retail in the long run.

Box 3: The Consumer

It is difficult to describe the modern or post-modern consumer of retail business because there are hardly any patterns that would fit even for a few major categories. Consumers seem very contradictory in their shopping behavior and demands but in fact they are just more conscious of the variety of goods and retail models that are offered to them. No longer can they be classified according to income groups, social status or occupation (Pietersen 2004, 62). Today’s customers have high demands and this not going to change in the future, not even in the face of a financial crisis. They want high quality product and good service, exclusivity – and all at low price. They are very conscious of what they get for the value of money. One could call this consumer “hybrid” as s/he might shop for the latest high-fi gadgets of the most elaborated cell phone at the same time buy her/his food at a discounter. These categories are “situational”. Situations are changing and so is the consumer’s behavior. It is not even possible to state that advertising is a success factor. A lot of retail businesses do not invest in advertising or branding and are very successful through mouth propaganda or their presence at exposed locations (e.g. Lush, Wholefoods).

Modern marketing identifies four categories of consumption (Riekhof 2004, 13):
- smart shopping
- discount shopping
- lifestyle shopping
- convenience shopping

To give an example, food discounters (in Germany) are especially popular among young families (63% prefer Aldi over a traditional supermarket, Pietersen 2004, 61).

From the perspective of the supply side in retail there has been considerable structural change that is still going on influenced by some technological but mainly organisational innovation. Case in point are traditional specialty stores (e.g. special food stores) which increasingly are on the down side. The exception is retail stores at gas stations. Another predominant trend is the upscaling of size: stores move out of town to cheap industrial or out-skirt areas where rent is low and parking space abundant and open larger shops with more stock and greater variety. Preferable locations are those where clients pass by on their way from home to work or where it is “fun” to shop on the weekend. This retail type response to the consumer demand for a greater variety of goods.
Also predominant is the rise of **discounters**. They can even expand their position in downtown areas and residential neighborhoods. A lot of retail business that used to be specialized is being displaced by discount chains that often start locally by an entrepreneur, expand nationwide and then expand into some other European countries. Discount stores for pet food (Fressnapf), clothes (Kik), shoes (Deichmann), consumer electronics (Mediamarkt, Saturn), books (Donauland), and food (Lidl, Aldi) are on the rise. Discounters give themselves a predominantly family friendly image as their goods are low price and can be afforded by young families. The limited variety of goods makes a quick overview and fast decision making possible. The scarce display features support the impression that the prices are fair and nothing is invested in fancy set-ups that in the end will be paid by the consumer. Besides, specialty goods that are offered only for a limited period of time and at low price serve as teasers to attract the customer regularly and put him/her under pressure to buy or miss a great opportunity for consumption and to return to the store regularly.

**Lifestyle: Green retailing**

Green retailing will be important for the future of retail. Since a certain group of shoppers has decided that they can no longer control the big issues, they are focusing on the little things, including watching what they spend (WSL’s most recent How America Shops Survey). New values have emerged, reflected in such trends as eating healthier, charitable disposal of old clothes and furniture through donations, recycling or resale, and using eco-friendly products. New values are coming to the fore and consumers are no longer defining themselves by the brands they buy and wear. The designer craze, according to WSL, is largely over. “It’s not just about having the right car or the right clothes anymore,” finds the WSL Survey. “It’s about good citizenship, products that are healthier and good for the environment, and shopping stores that support their causes.” Companies realizing this trend are responding to the consumer demand by the so called LOHAS: lifestyle of health and sustainability (alternatively called LOVOS: Lifestyle of voluntary simplicity). It describes a well educated middle-class elite trying to apply consumer responsibility and their post-modern values for environmentally friendly and politically correct values to the retail market. They have realized that as consumer they do have some power to face producers.

Sociologist and some organized LOHAS groups already speak of the “LOHAS movement”. Some marketing companies suggest that this movement will also spill over to less wealthy and lower class consumer groups but facing the financial crisis this seems unlikely. LOHAS probably do not belong to the group of people getting laid off in the course of the crisis nor does the stock market shake out limit their daily spending (LOHAS are more likely to invest in eco stocks that have not faltered as much as “traditional” stocks or hedge funds). Even though this consumer group or movement is small, this elite has an enormous purchasing power. The values transported here are not new. In fact, in the US they can be traced back to the counter culture movement of the 1960’s. This movement has an increasing influence on everything: day-to-day living, social issues, economics. In contrast to most other consumer groups, LOHAS have created their “scene”, a lifestyle identity. And it’s already having a direct impact on specialty retail, for example food, clothes, furniture, health & beauty products, even cars.\(^1\) The marketplace includes goods and services such as: organic and locally grown food, organic and natural personal care products, hybrid and electric cars, green and sustainable building, energy efficientproducts, \(^1\) They cut across age groups, income and education levels, religion, geography and gender. In the US where this phenomenon is most researched and studied by marketing firms, women make up 60 percent of the group, but men spend as much, if not more—they just shop less frequently. Some are married, some have children. Whether they live in the city, the suburbs or the country, “home” is high on their list of what’s important. So are the arts and the news. They’re information junkies: they read, research and question everything they see in print, online and on the air.

Secotral Innovation Foresight Interim Report – Future Innovation
electronics/applicances, socially responsible investing, natural household products (paper goods and cleaning products), complementary, alternative and preventive medicine (Naturopathic, Chinese medicine, etc.), fair trade products, and products from companies that show some Social Corporate Responsibility (SRC).

Aging society & single shoppers

Some retailers have noticed that demographic change in many parts of Europe will increase the demand for services, although consumers in general are very likely to spend less of their income in retailing compared to travel or entertainment. At the same time we are witnessing the rise of the “smart shopper” as many consumers will be more educated and possible more critical and conscious of what they buy. Instead of price-consciousness a stronger orientation toward lifestyles will dominate consumer behaviour – constantly challenging retailers to monitor consumer needs and analyze customer behaviour (Körber 2004). The future will also be more dominated by more single shoppers, they are overburdened with the big family package sizes at Wal-mart and other hypermarkets.

3.3 Intersection of S&T and demand-side drivers

At the intersection of technology drivers and demand side drivers we find ICT supported tools to respond to customer demand and at the same time the opportunities provided by ICT solutions offer new products and services to customers. Experts expect that ICT will help to better understand the customers, to further optimise the supply chain, to build closer relations with the customers, to design and offer customised products and services, to optimise shop floor operations, to increase efficiency, and to save costs. ICT and technological developments will also enable the provision of value-added services by wholesale traders (van der Giessen et al. 2009).

E-commerce

Many industry observer see e-commerce as key to the retailing business going beyond offering another retail channel to the consumers. Internet and new technological applications as the RFID will support one-on-one relationships between retailer and consumer and enhance mass-customisation. At the same time the power of the consumer – at least in some segments - will further increase. This all will require full flexibility on the side of the retailer and the value chain (van der Giessen et al. 2009).

- New ICT developments are triggering new retail products, processes, relying on new technological trajectories. Those trends are nurtured by:
  - mobile commerce
  - voice technologies
  - DAM (Digital Asset Management) an DRM (Digital Rights Management)

E-commerce and online shopping are based on components focusing on user-friendliness, improved service for the customer, such as creating and managing a web storefront presenting it in a catalogue mode, managing the search for and selection of merchandise by the customer, handling order and payment processes. There is a complex value chain involved in online-shopping that gets more and more advanced to support such activities as product selection, purchase, billing shipping and possible return of merchandise. Two of those features that are going to be more developed in the future are briefly introduced here:
Configurator: firms use configurator applications to speed the selling process, reduce errors in orders, and replace person-to-person selling with customer self-service.

Personalization: is the ability to track customers and respond to them by drawing on knowledge of their current and past contacts, interests, and behavior. (Friedewald/DaCostas 2003: 41)

**Personalization and Configurators**

Personalization is the selective delivery of content and services (such as specific product and service offerings, advertising, coupons, and other promotions) to customers and prospective customers. In short, personalization is the ability to track customers and respond to them in an individualised, personalised fashion on the basis of their current and past interests, contacts, and behaviour. The use of personalization software represents an attempt by e-businesses to extend the concept of personalization to the Web and, more recently, to other channels. Online use of personalization is unique in that it applies personalization techniques (such as specific product and service recommendations) in an automated fashion in real time at the point of sale. It also is unique because it allows for instantaneous capture of customer data (clickstream, purchasing, demographics, and so on) in electronic format that can be used to generate and update customer profiles and to change the website content presented to the customer accordingly (Friedewald/DaCostas 2003: 45). Examples would be greeting a customer by name, displaying her/his last purchases, offering her/him new versions of his last purchase or updates (e.g. in the case of software). Thus, the configurator has learned from past interactions.

Automated personalization uses so called personalization engines base on new techniques. These comprise collaborative filtering, rule-based systems, case-based reasoning, and neural network technology. These techniques are combined with modern content management systems and application databases to dynamically profile customers and match tailored content to their interests (Friedewald/DaCostas 2003: 45).

As for the sub-area “marketing & advertising” algorithms are used that allow the personalization of content, matching customer attributes, also including demographic information and buying behavior. This application allows customized product recommendations as they are used for example by Amazon.com. Amazon introduced a special technique called collaborative filtering: Repeat customers are offered recommendations for products that have been purchased by others, whose profile or order history are similar. (Friedewald/DaCostas 2003: 43).

Specific products require advanced customization. To design for example automobiles, bicycles, life insurances, mutual funds, desktop computer, telecom equipment etc. to the individual requirements of customers, configurators are used on the websites. These configurators clarify the buyer’s needs, optimize their product makeup and price the results. They may also include function like payment calculations, comparing advantages of leasing over buying etc. (Friedewald/DaCostas: 2003: 44).
Box 4: Enabling Technologies for E-commerce

Collaborative filtering (CF) is the process of filtering for information or patterns using techniques involving collaboration among multiple agents, viewpoints, data sources, etc. Applications of collaborative filtering typically involve very large data sets.

A rule-based system is a way of encoding a human expert's knowledge in a fairly narrow area into an automated system.

Case-based reasoning (CBR) is the process of solving new problems based on the solutions of similar past problems. Case-based reasoning is a prominent kind of analogy making.

A neural network is a powerful data modelling tool that is able to capture and represent complex input/output relationships. The motivation for the development of neural network technology stemmed from the desire to develop an artificial system that could perform "intelligent" tasks similar to those performed by the human brain.

A content management system (CMS) is a computer application used to create, edit, manage, search and publish various kinds of digital media and electronic text. CMSs are frequently used for storing, controlling, versioning, and publishing industry-specific documentation such as news articles, operators' manuals, technical manuals, sales guides, and marketing brochures.

Personalization engines operate as complex and intelligent data storage, analysis and combination machines. They are able to analyze a customer's implicit information, e.g. where and when and how often s/he uses mouse clicks when visiting a web site, the banners clicked on etc. They may also combine this with the explicit information given openly by the customer (transaction, purchases, demographics). Thus a profiling of each individual customer and an optimization of massages or ads displayed on the website are possible. The value of a website to the retailer (and possibly also to the customer) increases through enhanced stickiness, that is to say by viewing more content s/he is interested, the visitor/customer will stay on the site longer and revisit.

- The IPTS/ESTO report on S&T Roadmapping summarizes that a personalization engine generates the following recommendations:
  - specific products and services
  - cross-sells (suggestions for additional items)
  - up-sells (offering the customer an upgraded or higher priced product)
  - advertisement and other promotions
  - navigational links to other contents (Friedewald/DaCostas 2003: 47)

Web 2.0

After the predominant strategy of many retailers to cut costs to the bottom line and introduce new processes such as ECR (see chapter 3) one focus was on "customer centricity". This was to put the customer and her demands first and to undertake studies and analyse customer data to identify what the customer really wants. At the end of this process, some retailers were actually able to better store-level assortment, advance planning and offer some convincing customer loyalty programs. Interaction with the customer is supported by the introduction of the Web 2.0 technologies (Citino 2007).
Applications of the so called Web 2.0 represent an additional intersection of S&T drivers and consumer demand. To some these applications might still be in their infancies or nothing but technical gimmicks. To others these are signs of future technological trajectories. Basically Web 2.0 applications in retail are associated with

- a higher degree of participation on the customer’s side
- a greater variety of goods (even goods that are seldom requested)
- making shopping an online experience by use of smart-client technologies
- the convergence of anywhere, anytime, anyhow supported by the technical convergence of mobile phones, TV and the internet (triple play).

Web 2.0 allows the direct contact between producers and consumer. Especially for information-based products and intangibles this means that the physical retailer is no longer needed (Constantinides et al. 2008). Web 2.0 is also discussed fulfilling the criteria of Customer-Generated Content (CGC): users do not use the web in a passive way but add value to the content of the Web. Experts have pointed out that direct customer involvement and CGC might result in powerful network effects and user communities (O’Reilly 2005). An acknowledged definition of Web 2.0 or Social Media is still being discussed. O’Reilly describes it as a new form of collaborative Web, a “platform harnessing collective intelligence” (O’Reilly 2005).\(^2\) Constantinides/Fountain (2008) define Web 2.0 as “a collection of open-source, interactive and user-controlled online applications expanding the experience, knowledge and market power of the users as participants in business and social processes. Web 2.0 applications support the creation of informal users’ networks, facilitating the flow of ideas and knowledge by allowing the efficient generation, dissemination, sharing and editing/referring of informal content”.

It has to be pointed out however, that significance of Web 2.0 on retail is quite contested among experts. Though more opportunities for user/customer involvement are opening up only a few specialized retailers make extensive use of these options (Reynolds 2004)

One advantage for customers and retailers presented by Web 2.0 applications is the capturing of the "Long Tail". This term describes all the goods that are hardly ever asked for and thus, sometimes hard to find. Retailers using modern internet applications offer next to their core products also those they usually do not have in their assortment. These rare products, however, can be offered by cooperative partners of the retailer. The websites of those partners or rather their assortment is thus offered via the website of the first retailer. Both have a benefit since one of them gets to sell a product and the other can still tighten the relation to the customer.

Participation from the customer is increased by special features offering the possibility to ask for certain products and to get a reply or even for the customer to be integrated in the design process of a certain product. New possibilities unfolding here are also discussed under the term "Social Commerce" or “Social Media”, e.g. T-shirt makers running an online-business and letting their customers vote via internet which pictures to print on a T-shirt. Customers can even introduce their own creations and the one how gets the majority of votes wins a prize (see for example www.threadless.com). The focus is actually more on the event of creating rather than purchasing a product. E-commerce companies are increasingly trying to integrate their users into every step along the value-chain of the process. This includes suggestions for new products by online users, product developing by consulting online users, rating on products, asking for comments or additional information on products, getting support for setting up a shop (Schnieders 2004).

\(^2\) For discussion of definitions see Constantinides 2005
The new dimension supported by some Web 2.0 applications is the visual experience, the customer’s ability to interact with the retailer’s website. Special web designs are made possible by enabling technologies based on Rich Internet Applications (RIA), e.g. XML, AJAX, Flex. RIA makes user experience in an online store more attractive and engaging. Customers can go from website to website or from one store-shelf to another without having to wait for a page to refresh (Jain/Ganesh 2007). Early adopters of RIA are GAP and LL Bean, followers are Nike stores, Panic and Etsy.

Retailers have realized that they have to make the internet user an online customer and this is only possible if retailers accept the way users communicate on the web. With all the new web-enabled devices used at home and on the road such as WiFi laptops, mobile devices consumers have made the web part of their social fabric. Retailers have started to make this social fabric a part of their instrumentation (Swoboda et al. 2009). Constantinides et al. (2008) differentiate three dimensions of Web 2.0 (see figure 5). Application types include product reviews, blogs, partnerships with social networking entities such as MySpace, Facebook, Second Life, etc. (see also Citino 2007). The diagram is not exhaustive. Additional features could fit in the categories as well.

Enabling technologies for these new services with content from multiple sources comprise, for example mashups. These data sources can be the retailer’s proprietary data combined with web feeds or public sources, e.g. information on products, test results, location maps, etc. (offered by Flickr, Google, Ebay, Amazon) The combination of such services with the retailer’s website are called user collaboration. According to the diagram below, these would fit into the category of applications. By inspiring the users and customers to engage in a dialog with other clients, the retailers can create a community for their products and connect to the social web (offered by Amazon, Ebay). An additional functionality is offered by a live agent chat, especially if the customer is making an involved purchase online (Otto offers such services, see box 5). The live agent can answer in realtime special questions on the products, product applications and services attached to it. Voice over internet protocol (VoIP) supports this feature, e.g. powered by Skype (Jain/Ganesh 2007). VoIP is offered by ebay but aside from this company only rarely found so far.

Wikis are web pages that can be edited by multiple authors, allowing collaborative publishing. Widgets are mini computer programs to be used as a graphical user interface. They integrate information from other web sites, e.g. the integration of youtube films into a retailer’s website.

Another enabling technology, RSS feeds, can be used by online retailers to effectively expand their reach. RSS are subscription-based data feeds. Once a customer subscribes to the feeds, the feed reader automatically retrieves content from the source. This happens even when the customer is not visiting the online store. RSS can add value by communicating the launch of new products, promotions, store openings, additional product information and multi-media links (supported by Tesco, Amazon, Sainsbury’s, HMV). Additional features can be transmitted by podcasts and video casts which are an effective means of communicating product features, usage, product comparisons etc. to the customer (promoted by HMV, Sainsbury’s). Even more advanced is the Semantic Web which can enable the retailer to show search results of related, associated or complementary products or services. This enables up-selling and cross-selling opportunities (Jain/Ganesh 2007).

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3 RSS: Rich Site Summary or Really Simple Syndication
It is contestable to what degree Web 2.0 usage from the customers’ side contributes to “empowerment”, “democratization” etc. As there are no categories to measure these effects empirically and scientifically sound they should be used with care. After all, the goal of retailers is to maximize profits – no matter if the goods they want to sell are created with or without customer participation.

One effect of Web 2.0 though is that it enables the creation of user communities and the exchange of information that at some point becomes uncontrollable by retailers (see Constantinides et al. 2008). Customer-to-customer trusted information exchange also enables buyers to recommend products or to discuss their quality. Some companies even make use of this customer-to-customer conversations in another way: **Crowdsourcing** is the term for an effect of outsourcing: It describes the phenomenon of customers taking over formerly generic company activities (e.g. select motives for T-shirts), bringing the products closer to the demand of the customers. Two examples of crowdsourcing are demonstrated by LEGO and by Procter & Gamble. Lego released its firmware for LEGO Mindstorm as open source so that users can program their own Lego microprocessor. The director of LEGO Mindstorm expects new advances in robotic development to be shared with the community. Members of the Proctor & Gamble Tremor community, consisting primarily of teens, provide their ideas for developing product ideas such as new video games and marketing programs targeted at teens (GCI et al. 2006).

Since the customer-to-customer conversations are published in the web, they present a valuable source of information on customer behavior and preferences to retailers. In fact, consultants are recommending marketers to monitor such information sources to launch new market successes.

A study conducted by Infosys in 2007 among e-commerce retailers and their Web 2.0 applications concludes that very few retailers like Amazon have taken the lead. Amazon uses a combination of tools that leverage consumer experience without frustration and the tools match each other. Most e-commerce retailers surveyed need to catch-up. The implementation of tools that increase reach to consumers, maximize conversion, or support consumer loyalty lurk risks as some business benefits are easily quantifiable while others are intangible. Besides, there is always a security risk, especially on behalf of Ajax-based web pages (Jain/Ganesh 2007).
Interestingly, the majority of retailers making extensive use of Web 2.0 features are large companies (Constantinides 2008). Körber suggests that the traditional bricks and mortar businesses with their long standing expertise in logistics and with solid financial backing are in the best position to become the key players in e-commerce in the future (Körber 2004).

Box 5: Otto and Web 2.0

The Otto group is one of the biggest European retail and services companies, originating in Europe. Traditionally a remote retailer reaching customers by catalogue mailings, Otto today uses a multi-channel strategy. Over the years, Otto has purchased several international retailers with diverse distribution channels. In E-commerce Otto group is today the 2nd largest company worldwide after Amazon.

Some innovative marketing features are run by Otto that are designed to achieve higher customer participation, higher identification with the products and thus higher turnover. In 2006 Otto online started their “Cinderella story”: Female customers were asked to apply for the title of the Otto Cinderella of the year, voted by other female customers online.

The applicant with the most votes was not only selected Cinderella but also won a designer dress and offered a model contract for the Otto catalogue. According to Otto.de more than 2,600 customers applied for the Cinderella title and more than 100,000 people participated in the voting. The activity generated more than two million page views.

Another feature introduced by Otto.de was the Christmas blog. This also started in 2006. Moderated by a well-known Otto model, customers as well as employees participated in a dialogue around the subject of Christmas, e.g. what gift to give to whom, what recipes to explore for Christmas meals, what gift wrappings and decorations to use. Latest online actions introduced by Otto.de include a blog by female reporters and designers on the latest fashion trends in Berlin, Hamburg and New York and discussion of the latest model, Nina Hagen’s daughter Cosma Shiva.

Otto’s marketing and distribution experts are working on high tech solutions to bring together all necessary features from mobile, online and TV communication to merge ubiquitous entertainment with ubiquitous consumption. This is increasingly made possible but not yet ultimately achieved by the necessary bandwidth of the internet, more intelligent computers and high-definition TV. In Japan, Otto Sumisho is much more advanced than anywhere else. Every electronic order is conducted via cell phone. In Germany, M-commerce has not reached much attraction yet.

T-commerce (television commerce) is also still underdeveloped. However, Otto is a frontrunner here, having started a strategic partnership with Microsoft to promote triple-play where the TV and its interactive features play a prominent role. Marketing experts trust that retail via interactive TV will stimulate the emotional side of the customers and thus promote impulse shopping. TV pictures and the interaction between the picture and the customers will be seductive than professional commercial photography. A TV set that is suitable for high definition TV can provide four times as much information as a conventional one and is thus comparable to a PC. Microsoft’s shopping application “Microsoft Media Center” was developed to optimize the shopping experience via HDTV and can easily be used by remote control (Schnieders 2004).
Customer Relations Management

Other interactions of demand-side drivers with science and technology drivers occur at the front of customer relations management (CRM). CRM comprises the objective to establish and maintain a long-term relationship with the customer in order to have satisfied customers and ensure the long-term success of profit maximization of the company. Though certain forms of CRM have always existed as long as retail exists, the term was created in the 1990s, giving rise to several approaches that were often too abstract to be implemented into the value chain. In the subsequent phase software tools like Siebel were introduced, social relationships, however, were neglected. Finally in the third phase we witness a differentiation of “schools” taking a holistic approach and combining the human factor, process organization and IT. Today and in the future CRM is relevant wherever customers are involved. CRM is an approach to be in a continuous dialogue with the customer, to get feedback on product applications and quality, to improve products and services and to customize products according to individual needs. Modern CRM approaches make use of software tools to efficiently combine the following levels: interaction, cooperation, information, integration and transaction. This might sound simple, but as a matter of fact turns out to be very complex. Software solutions like data warehouse in the 1990s took too broad an approach, generating tons of data that no one could handle. Data mining tools are developed to solve such problems: reduce the amount of information to what is really necessary (Buser/Welte 2006).
4 Emerging innovation themes and their requirements

Emerging innovation themes are strongly related to internationalization, to changes in consumer demand and to ICT support to find solution for these new demands. This is not to say, however, that innovation themes lay mostly on the technology side. Quite on the contrary, most innovation themes, new products and processes are related to organisational and service innovation. Innovation themes touch not only the organization of retail but also the structure of the companies and of the sector. Since “hard technologies” are predominant innovation themes, it is sometimes difficult to distinguish whether a new type of retail is a new strategy or a new product. From the perspective of the Europe Innova Project, there are also some linkages to the developments of the food and beverage sector, the textiles and clothing sector, the construction sector, and the opto-electronics sector.

Presently, the market is saturated not only in the old member states but also in the new CEE. Some big Western retailers enjoy their established position. A study by KPMG on 180 companies in the East, including 64 companies in the consumer business, showed that “the sector was growing its top line by about eight percent annually, with productivity increasing by about nine percent and employee head count holding steady.” (KPMG 2006: 3) In the East, much of the development has been driven by the multinational retailers that have moved swiftly to satisfy the demand of consumers in the post socialist era. After saturation has reached the market, more variation for consumer demand and hence more diversified strategies for retailing are emerging.

The global competition that is indicated here is a variable that affects not only the market structure in the Eastern states but also in the West or on the traditional member states. This global competition will further increase. Retailers and wholesale traders will to a greater extend have to compete at a global scale, also because of the further adoption and exploitation of e-commerce. At the same time, retailers and wholesale traders will focus on their regional, national and interregional markets.

Figure 6
One uncertainty that makes it hard to look into the future is the performance of emerging economies (China, India, Brazil, Russia). It remains to be seen if they will continue to drive global growth. Or if North American and European retailers and wholesale traders will continue to enter these emerging markets, by establishing enterprises in these emerging economies as well as by implementing e-commerce applications. An alternative would be that emerging markets are well served by local retailers or by international players already established there.

The availability of natural resources and how scarcity might affect the retail sector is also unclear. Scarcity would lead to high costs, of course and hamper retail and wholesale.

Figure 6 by the Global Commerce Initiative, Cap Gemini and Intel summarizes framework conditions a economic, ecologic, regulatory, demographic and technology level and their impact on the future value chain composed by consumer behavior, information flow and product flow.

Table 2 on the next page summarizes the major changes to the value chain according to opportunity area, their underlying external determinants and industry trends, and their impacts and consequences on product development, production and sourcing, logistics and provisioning, and on marketing.
Table 2: Changes to the value chain

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Shopper Dialogue</td>
<td>* &quot;Smart&quot; consumer</td>
<td>* Improved demand signal</td>
<td>* Home delivery impact</td>
<td>* Two-way dialogue</td>
</tr>
<tr>
<td></td>
<td>* Joint innovation</td>
<td>* Sustainable sourcing</td>
<td>* Product introduction</td>
<td>* New marketing toolkit</td>
</tr>
<tr>
<td></td>
<td>* New marketing approaches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Sharing</td>
<td>* Real-time visibility</td>
<td>* Accelerated by collaborative information platform</td>
<td>* Real-time inventory visibility</td>
<td>* Multi-channel marketing consistency</td>
</tr>
<tr>
<td></td>
<td>* Information platform</td>
<td></td>
<td>* Greater accuracy with EPC tags</td>
<td>* Better consumer feedback</td>
</tr>
<tr>
<td></td>
<td>* Standardisation</td>
<td></td>
<td></td>
<td>* Target marketing</td>
</tr>
<tr>
<td></td>
<td>* Demand of customer for product information</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synchronised Production</td>
<td>* Consumer is King</td>
<td>* Late customisation</td>
<td>* Frequent customer replenishment</td>
<td>* Personalised offerings</td>
</tr>
<tr>
<td></td>
<td>* Minimum inventory flow</td>
<td>* Standardised packaging/ labelling</td>
<td>* Near real-time production [smaller batches]</td>
<td>* Speed to market</td>
</tr>
<tr>
<td></td>
<td>* Localised production</td>
<td></td>
<td>* Shared deliveries</td>
<td>* Improved product quality</td>
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<tr>
<td></td>
<td>* Reduced production cycle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Logistics/Home Fulfilment</td>
<td>* Energy/fuel costs</td>
<td>* Shelf-ready packaging</td>
<td>* Deliveries nearer to the customers</td>
<td>* Better service, consolidated home delivery</td>
</tr>
<tr>
<td></td>
<td>* Environmental impact</td>
<td>* Size/package standards (unit loads – also for logistics)</td>
<td>* Optimal delivery</td>
<td>* More channels to market</td>
</tr>
<tr>
<td></td>
<td>* Regulatory Impact</td>
<td></td>
<td>* Near real-time production</td>
<td>* Better price and quality</td>
</tr>
<tr>
<td>Sustainability</td>
<td>* Energy costs</td>
<td>* Package design</td>
<td>* Environmentally friendly product</td>
<td>* Competing on &quot;greenness&quot;</td>
</tr>
<tr>
<td></td>
<td>* Environmental impact</td>
<td>* Product Lifecycle Management</td>
<td>* Optimised transport (full trucks, ship, trains)</td>
<td>* Threshold on minimum sustainability level</td>
</tr>
<tr>
<td></td>
<td>* Regulatory impact</td>
<td>* Sustainable sourcing</td>
<td>* Returnable transport items</td>
<td></td>
</tr>
<tr>
<td>Company Cultural and Behavioural Changes</td>
<td>* Collaboration</td>
<td>* e.g., Wiki-style collaborative design</td>
<td>* Shared data</td>
<td>* e.g., Building a trusted relationship with the consumer</td>
</tr>
<tr>
<td></td>
<td>* Cross-border business will drive cultural change</td>
<td>* Shared product innovation/ development</td>
<td>* Collaborative Planning and Forecasting</td>
<td>* Collaboration</td>
</tr>
<tr>
<td></td>
<td>* Reward structures</td>
<td></td>
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</tbody>
</table>

Source: GCI et al. 2006
4.1 New products, processes, technological trajectories

As stated already in section 2 of this report, ICT and web 2.0 lay the ground for many innovations, processes and technological trajectories. We will focus on a small selection of examples here and will also give account of non-technological innovations in products and processes.

Efficient Consumer Response

One major organizational driver for the wholesale and retail sector supported by innovations in ICT is “Efficient Consumer Response” (ECR). ECR is a customer-oriented and integrated tool for supply chain optimization in which all parties involved work together. The primary aim of ECR is to create the tools and technologies for a cooperation between commerce and industry for a better fulfillment of customer needs. ECR implies a complete integration of information and supply chain with the implementation of new processes for commerce and industry. This means for example that orders will be generated with modern information technologies from sales data of individual products. These orders are adapted to the consumption of the products ("selling to the scanner"). Insiders demand a fundamental change of view for the successful realization of ECR. They think that the confidence between the cooperation partners is the main prerequisite for an implementation of ECR. ECR requires department-spreading responsibilities for the control of the flow of goods and implies organizational changes on the supplier side and the commerce side.

Box 6: Strategies as prerequisites for successful ECR

<table>
<thead>
<tr>
<th>Efficient Replenishment -</th>
<th>Optimization of the logistics chain by replacing the push strategies by pull strategies. It is also called Continuous Replenishment (CR).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient Assortment -</td>
<td>Revision of categories for an increase of customer satisfaction and optimization of product profitability. Essential art of Efficient Assortment is the Category Management (CM).</td>
</tr>
<tr>
<td>Efficient Promotion -</td>
<td>Replacement of the stock-up system with large quantities and campaign prices by an efficient common purchase policy.</td>
</tr>
<tr>
<td>Efficient Product Introduction -</td>
<td>Cooperation of commerce and industry for a common development and introduction of new products.</td>
</tr>
</tbody>
</table>

So far, mostly deployed by large and multinational companies, SME are increasingly catching up. Major investments for the company’s ICT are required to integrate this feature into the supply chain. One challenge for the future is to find solutions for ECR even for low-scale products to optimize continuous replenishment and customer relationship management. The introduction of mobile end-products in combination with the internet promises a fair-cost integration into the existing information systems and work organizations of SMEs. Logistics providers serve as the nexus between manufacturers and SME retailers, providing not only for the distribution of goods but also for billing, ordering and commissioning.

ECR works similar to a standard platform. Dating back to the 1990, this movement responded to rapid advances in ICT, shifts in consumer demand and the globalization of goods distribution across nations. It was supported by governments initiatives such as the European market. The is in principle a European standard. At global scale the Global Commerce Initiative (GCI) was founded to adapt common methods of operations for business to other continents. According to Bell and Cuthbertson (2004), GCI is a “voluntary platform to improve the performance of the international supply chain for consumer goods through the endorsement of recommended standards and key business processes. It builds on the Foundations of the regional ECR initiatives…” (p. 65).
Besides these technology-based processes there are also a couple of new services or service combinations that could be labeled as a new product. Some supermarket chains are trying to compete not only in terms of price and quality of food (freshness) but also with additional services: delivery, gastronomy (freshly made ready-to-go dinners), catering. They are changing from plain retailers of goods to service providers and offer in their stores dry cleaning services, photo development, shoe repair, some also include postal services since this sector is getting more liberalized. Some specialty stores offer child care and the booking of trips.

At the intersection of new products and new firm strategies we find some innovative discounter. As mentioned above this retail type usually profits from the limited variety of goods that comprises their basic stock, but they tend more and more to offer goods for a limited period of time that traditionally does not belong to their assortment, e.g. food stores offering clothes or books, consumer electronics, even travel vouchers, photo development, mail order flowers. So there is a penetration into other retail areas. One case in point is Tchibo, traditionally a coffee shop chain, which offers household goods, consumer electronics, etc. and vacation trips at discount prices for limited time periods. Aldi, the traditional German food discounter which has expanded into many European countries and overseas is already ranking no. 6 among the German clothes retailers (p. 54). Experts estimate that discounters will continue their success.

Besides new products and services there are also some logistic process beyond ECR that need to be considered by retailers. Logistic and distribution scenarios tend to favor more centralized options for distribution to yield greater supply chain efficiency. In terms of speed companies have demonstrated that they are much better at achieving acceptable lead times to their customers, but compressing supplier lead times is much more difficult.

Future challenges with regard to IT:

Today there exists an abundance of software in retail as actors along the supply chain use various kinds. This makes collaboration sometimes very difficult, especially after mergers and acquisitions and supply chains with different software are to be integrated (IBM 2004). New challenges for data collection can also be summarized under the headline of data fusion. This includes the compatibility of data generated in one system and being read and transferred to another system. This can be important for the introduction of new features into older systems or when a new supplier using different systems enters the supply chain. Standardisation is needed. One solution can also be the use of an interface to make data compatible to the introduction of standardized software products instead of using proprietary solutions. Data mining needs to be further developed to analyze the data collected and to advance customer profiling. This requires tools that are capable to interpret the data gathered and to setting them in relation to data gathered on other customers or customer groups. Connected to this are intelligent reward and loyalty schemes, thus automated functions that offer special prices or products to loyal costumers. Software tools for customer profiling have to be able to analyse customer behavior, give scores according to the benefit of the retailers, and interpret this for future sales and product demands, distribution etc. Close related to such rating and reward systems is personalization. Here, self-learning systems are challenged to recognize a customer by her behaviour, relate this to similar patterns and in the end make up-selling and cross-selling possible. Trajectory analysis can give account of a customer’s search and selection behaviour.
Not only the online customer is in the focus of new software technologies but also the customer who visits the store. Some basic research is needed to improve the awareness of the customer's social behaviour. **Neuroeconomics**, for example, combines neuroscience, economics, and psychology to study how people make decisions. It looks at the role of the brain when we evaluate decisions, categorize risks and rewards, and interact with each other. One step further towards application is the **neuromarketing** - a new field of that studies consumers' sensori-motor, cognitive, and affective response to marketing stimuli. Researchers use technologies such as functional magnetic resonance imaging (fMRI) to measure changes in activity in parts of the brain, electroencephalography (EEG) to measure activity in specific regional spectra of the brain response, and/or sensors to measure changes in one's physiological state (heart rate, respiratory rate, galvanic skin response) to learn why consumers make the decisions they do, and what part of the brain is telling them to do it.

In order to present the store as real-time walk through and display the goods in an appealing manner, online stores have to implement **3D design applications**. For a visit in a brick and mortar store **immersive visualization** tools can support the customer to match new furniture into her apartment style at home which she sees virtually in special glasses or 3D-monitors. **Security and theft prevention** are additional topics to be tackled with modern technologies. **CCTV** and **RFID** can be used to prevent theft from customers and employees because these technologies allow the monitoring and tracking of people and goods. **Store environment simulation** can improve **energy efficiency** in a store. Some of these technologies may pose severe infringement of customers’ and employees’ **privacy**. Some scandals came to the fore recently in Germany where the discounters Lidl and Schlecker have illegally surveyed their employees. The line between legal surveillance and infringement of personal privacy is often not clearly defined as modern technologies and their implementation are a step ahead of legislation. This is definitely an issue for institutional requirements.

**Box 7: Collaboration and information flow**

To improve collaboration and information flows, consultants like Cap Gemini and retailer organizations like GCI suggest a network approach such as a collaborative data sharing platform (see figure). This platform collects and provides data from diverse source to various actors along the value chain: point-of-sales, forecasts, product initiatives (item introductions, R&D, promotions, product movement, consumer insights, etc. The ability to use data from this platform offers opportunities of assessing the impact of new product launches and evaluating their success on a constant basis. The evolution of this type of network depends on the implementation and use of certain standardized (IT) tools: RFID tags, Global Data Synchronization Network (GDSN) for aligning product and location information among all actors along the value chain, GS1 e-communication standards covering transactional information, event information and market-driven information; and the use of EPCglobal Network (GCI et al 2006).
4.2 Organisational change and firm strategies

Growth

As Reynolds puts it, the retail sector has been rather slow to adopt business strategies. Today, retail strategies react to the most important structural trends such as large organizations running most of the retailing in western economies and expanding in transitional economies. Strategies have to be designed to support retailers with growing larger and faster than their competitors, being different from their competitors, attracting and keeping customers, gaining efficiencies in systems and procedures (Reynolds 2004).

Organisational change and firm strategies in the retail sector respond first of all to changes in consumer demand. New retail formats and business models are in a way organisational innovations trying to fill the gap others do not serve. There are, of course, a lot of second mover who change their retail format once they realize that their competitors are more successful.

Retail formats and marketing strategies

Convenience stores (e.g. as they are integrated in gas stations, train stations and airport shopping centers) belong to such innovative retail formats that are prospering. So are discounters, neighborhood stores and big specialty stores. They are crowding out supermarkets and department stores. This shift is a reaction to consumer’s preference for clear and focused assortments at reasonable prices and at the same time toward availability and customization. In the past, supermarkets and department stores overwhelmed and irritated their customers with the unstructured variety of goods. Convenience stores are up front in the UK and in France. They are catching up in Germany as well. Neighborhood stores in bigger European cities offer fresh food, over the counter meals almost around the clock next to fresh produce, snack and TV dinners. These concepts are being practiced at chains like Tesco, Sainsbury’s, Marks & Spencer and Delhaize. They have several retail concepts combined in a comparatively small retail space.

Box 8: Selected marketing strategies

<table>
<thead>
<tr>
<th>Type of Marketing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct marketing</td>
<td>personalized marketing, addressing the customer at individual level (snail mail marketing)</td>
</tr>
<tr>
<td>Network marketing/Multi-level marketing</td>
<td>Building on a system of trust and personal references (Amway Quixtar, Herbalife)</td>
</tr>
<tr>
<td>Snowball marketing</td>
<td>building on the continuous entry of new participants and their investments to stabilize the retail system</td>
</tr>
<tr>
<td>Target marketing</td>
<td>Segmentation of the market into specialized assortments and consumer groups</td>
</tr>
<tr>
<td>Attraction marketing</td>
<td>turning shopping into a unique experience (IKEA)</td>
</tr>
</tbody>
</table>

Mergers & Acquisitions

Firm strategy does not only have to respond to changing consumer needs and expectations but also to changes in market structure. These are mainly driven by globalization. On the one hand, new players are entering the global market, some that have only operated so far nationally, now want to be international; on the other hand, a consolidation process is crowding out players that are not able to keep up with the pace of globalization and innovation. Examples for these strategies are given in the box below for the Central Eastern European member states. Consolidation has become a dominant trend that we can see in large supermarket chains (hypermarts) and department stores but also in other retail organization forms (e.g.
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Metro/Allkauf, WalMart/Wertkauf, WalMart/Spar-Plaza, Metro/WalMart). There is intense competition among retailers. This leads to further concentration in number of retailers and in retail turnover (high volume retailing). Small retailers focus more on customer relations and customisation for higher profit margins.

One trend along the value chain is the increasing collaboration and building of key relationships vertically and horizontally - among similar partners and between partners with a different position in the value chain (e.g. retail buying networks, co-branding, franchising).

Box 9: Catch-up in the CEE

Challenges for the retailers in the CEE countries are the low profit margins that are set by the multinational discounters such as Lidl (KPMG 2006: 7). Lidl is even growing to be a serious competitor to hypermarkets such as Carrefour and Tesco which have been market leaders in the CEE so far in terms of keeping prices low and offering a broad variety of goods. Both hypermarkets and retailers of branded goods will experience increasing pressure by discounters. Many retailers respond by reducing (some) prices on the one hand and offering promotional incentives on the other hand. Some markets as the one in Poland are already overheated. There are already 14 multinational retailers in Poland competing for a reasonable share of the market. In the Czech Republic there are 11. In the CEE we find 18 multinational retailers of Western origin, about half of them with presence in at least three markets.

Prospects predicted by experts are that the market will consolidate and will be divided among a few players according to mutual agreements (KPMG 2006: 8). A consolidation among the big players will also give smaller, regional more specialized retailers a chance to introduce new formats, e.g. convenience stores including petrol station forecourts. This approach offers also the advantage of moving into smaller towns where the economies of scale for discounters and hypermarkets are not always possible to generate. One of the strategies here is to establish partnerships with suppliers and manufacturers to generate some benefits.

Some manufacturers – multinational as well as regional – have experienced obstacles affecting the distribution chain. Though their products were sitting in the retailer’s warehouse, they were not put on the shelves. Sometimes local distributors operated in an inefficient way so that multinationals like British American Tobacco built an entirely new distribution system called Direct Store Delivery (DSD). This strategy supported BAT’s instant surge in the Hungarian market (KPMG 2006: 23).
Local brands and retailers are re-entering the market, trying to fill gaps that have not been covered by the Western multinationals. At the same time, notwithstanding the rising income consumers are still looking out for low price goods, thus putting pressure on margins for the foreseeable future (KPMG 2006: 4). Accordingly, multinational discounters are thriving to meet the low price purchase of the CEE consumers. Tesco hypermarket is an example for a retailer using their scale across the region to drive down prices through centralized purchasing and logistics operations. Tesco operates 200 outlets and 12 million square feet across Poland, Hungary, the Czech republic and Slovakia. On the other side consumers are also beginning to demand for high quality and regional products. As in the West, even though at lower scale convenience specialty and health care formats are evolving. Petrol station forecourts are lending themselves better to premium brands and categories such ready-made meals. One case in point for a local provider is Elemeg, a locally owned Bulgarian supermarket chain. Elemeg has successfully combined modern retail formats with the traditional “social” elements of shopping, presenting a central experience for local customer (KPMG 2006:5)

More lifestyle variations that arise with growing income are covered by Familia, a fast-growing food chain in Bulgaria. They focus on speed, service and creativity as well as family-oriented convenience stores located in walking distance to their consumers. This kind of regional providers do not try to compete with low price chains like Metro, Billa, or Kaufland. Instead, local or regional retailers have to develop their unique selling point.

Drivers for innovation and change in the CEE countries are:
- **Availability:** retailers have to find a balance between growing assortment and shrinking shelf space and still offer all the goods and quantities demanded by the consumers in a fast and flexible manner
- **Collaboration:** In order to cope with the price, space and time pressure retailers will have to collaborate more along the value chain to achieve profitable growth.
- **Distribution:** As retailers continue to leverage their scale, modern logistic infrastructure will become increasingly centralized. Suppliers will have to adjust, implying higher return from investment in logistics and value-added providers versus traditional distributors.
- **Regionalization:** While product life cycles are being cut, niche players are beginning to fill the gaps and local or regional brands are able to establish a unique selling point (freshness, local patriotism, lifestyle, attitude). Also multinationals are starting to think regionally, including regional providers into their value chain.
- **Value:** evolving market conditions are starting to favor local and regional brands as their quality is often higher and prices remain fairly low. Private labels grow in popularity, especially in the food and beverage sector.
- **Customization:** consumers are getting more sophisticated and demanding. Only retailers that are able to fulfill the narrow margins at reasonable price-quality ratio will be able to make a profit in the long run (KPMG 2006: 6-7).

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4 One regional company is the Czech Walmark, specialized on pharmaceuticals. Walmark is operating in six neighboring countries: Slovakia, Poland, Hungary, Romania, Ukraine and Lithuania. It used to be a local brand before the multinationals conquered the market and is now re-entering. Another brand is Kofola, a leading local cola brand from the Czech Republic, dominating in its home market and expanding to Slovakia and Poland (16).
4.3 Skills requirements and the knowledge base

**Current situation at the labor market**

In the EU27 the retail sector ranks among the lowest in terms of average personnel cost (rank 4 at the bottom after leather, hotels/restaurants, textiles). At the average, annual personnel cost was 18,000€ per employee (Eurostat 2008).

After the textile sector, retail ranks highest in employing women, over 70%. Looking at the share of part-time employment, the retail sector ranks even highest.

These figures indicate already that retail is socially not a very prestigious sector for employees. This impression is supported by high share of unpaid labor. Retail ranks second from the bottom, barely 80% of the employees are paid. This is to say that 20% of the labor force are unpaid family members for the most part.

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**Figure 7: Average personnel costs, EU-27, 2005 (€ 1000 per employee)**

- Coke, ref. petrol. prod. & nuclear fuel
- Air transport
- Chemicals & man-made fibres
- R&D
- Transport equipment
- Computer services
- Water transport
- Electricity, gas & water supply
- Machinery & equipment n.e.c.
- Electrical & optical equipment
- Pulp, paper, publishing & printing
- Post & telecoms
- Supp. transport act, travel agencies
- Basic & fabricated metals
- Rubber & plastics
- Wholesale trade
- Other non-metallic minerals
- Mining & quarrying
- Banking
- Non-financial business economy
- Real estate
- Other business activities
- Construction
- Land transport, pipelines
- Food, beverages & tobacco
- Motor trades
- Manufacturing n.e.c.
- Wood & wood products
- Retail trade
- Textiles & textile products
- Hotels & restaurants
- Leather & leather products

(1) Including rounded estimates based on non-confidential data.

Source: Eurostat (SB9)

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**Figure 8: Top five and bottom five activities: share of women employed, EU-27, 2006 (% share of total sectoral employment)**

- Textiles & textile products
- Retail trade
- Leather & leather products
- Hotels & restaurants
- Real estate

**Figure 9: Top five and bottom five activities: share of part-time employed, EU-27, 2006 (% share of total sectoral employment)**

- Retail trade
- Hotels & restaurants
- Other business activities
- Real estate
- Air transport

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Source: Eurostat (LFS)
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Based on these statistics, it is not very hard to guess that most jobs in retail are low-skill. However, some fundamental changes are discernable. As the retail and wholesale sector relies more and more on the ICT, the composition of the labor force is changing. While traditionally jobs such as managers, accounting & finance professionals, sales & marketing professionals, supply chain professionals, office clerks, service workers, crafts workers, motor vehicle drivers, machine operators, transport and freight handlers as well as health professionals were the most prominent ones, ICT specialists are increasingly required to develop, implement, run and maintain software and hardware solutions.

Accordingly, the share of Level 4\(^5\) educated personnel is increasing. Most studies on skill deficits and skill requirements in the retail sector do not include all these professions. They focus mainly on sales staff, management and ICT specialists.

**Skill deficits in the retail market**

The use of ICT and e-business skill is perceived as a major enabler to increase productivity and competitiveness, which are at the heart of the Lisbon strategy. This requires an adaptable labor force. Only a skilled labor force in the retail and wholesale sector will be able to generate innovations or adapt innovation in such a way that they can bring an advantage to the industry and/or the consumers.

Several studies commissioned by the EC and the ICT industry stress the fact that the European industry is suffering from a significant e-skill deficit. In its Action Plan for skills and mobility the European Commission acknowledges the evidence of a “shortage in ICT occupations and sectors” as “one of the biggest concerns of enterprises”. The e-skills gap may no longer be as threatening as perceived when the Action Plan was drawn, however, from the scanning of recent studies there still seems to be an ICT skill mismatch as well as the risk that the current situation may result in future problems. Forecasts predict that in user industries the need for ICT experts will rise. Thus, to support the economy, efforts have to be undertaken to improve the e-skill

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\(^5\) ISCED: The International Standard Classification of Education was designed by UNESCO to compare education levels internationally and to collect data on the status of national education systems. Level 0: Pre-Primary Education; Level 1: Primary Education or First Stage of Basic Education; Level 2: Lower Secondary or Second Stage of Basic Education; Level 3: (Upper) Secondary Education; Level 4: Post-Secondary Non-Tertiary Education; Level 5: First Stage of Tertiary Education (Not leading directly to an advanced research qualification); Level 6: Second Stage of Tertiary Education (Leading to an advanced research qualification)
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situation. Particularly in retail, there is a gap between highly skilled ICT professional for finding solutions for the future challenges (e.g. data mining, data fusion, virtual store design) on the one hand; and low-skill employees on the other hand. This gap seems to widen more and more. Even though ICT solution in retail seem to get simpler, this does not mean that at the low-skill level ICT skill are not required. On the contrary, shop floor employees have to be trained to use and understand such technologies. And since new technologies are introduced regularly continuous trainings and the openness for new technologies are preconditions.

A survey conducted in 2001 states that less than a third of the EU labor force has ever received any ICT training and only 4% of low-income earners (3% for female) have ever received training paid for by their employer. The e-Business W@tch survey of 2002 showed that in nearly all sectors, employees have access to e-mail and the internet. Interestingly, the most ICT intensive sectors are real estate, telecommunication and computer services, retail, business services and health and social services. However, only in retail and health & social services do less than 60% of the employees use e-mail for external communications.

Many retailers lag far behind the state of the art in ICT skills and applications that are common in other businesses today. Sector experts who undertook studies in the UK conclude that one of the reasons for this phenomenon is the risk averseness of retailers. Scale, cost and complexity of transformational technology projects are overburdening the average retailer. Investment for modern IT is not provided in an organized and sufficient way. Employees are not skilled in project management and lack adequate training. There is insufficient knowledge – and maybe insufficient interest – of customer benefits on behalf of the products and how this benefit could be measured (Reynolds 2005). Further, in many stores, ICT is outdated and the retail companies cannot provide the necessary investments for updates every two years as would be adequate.

The skill situation at EU level in retail and wholesale is still a blind spot and coherent data not available. For some countries a few studies exist that give account of the (mis)match of skill requirements and skill level.

Skillsmart retail study of the sector in the UK sketches an alarming picture of the training situation in the sector. Only 34% of those working in retail are qualified at Level 3 or above (compared to 52% of the whole economy). At management level, 13% are without any qualification at all (in persons that is 75,000), while only 22% are at Level 4 and above (compared to 39% in the whole economy). One fifth of retailers in the UK say they are having a skills gap, and unskilled staff could seriously impact the competitive performance. Staff in this sector also need to understand their responsibilities and the complex legislation that governs the sale of goods, trade descriptions and consumer protection. Without this understanding, retailer’s risk of non-compliance with the law which could potentially jeopardise the reputation of the firm.

Training efforts and requirements

According to e-Business W@tch, about 60% of the retail enterprises surveyed in 2002 regard “learning on the job” clearly as the most important way to develop IT skills in the company. Less than half as many companies regard formal training schemes as very important for their IT skills development and 38% think that self-learning activities are very important.

One target group for special training efforts are women. Particularly young women are far less interested in studying mathematics and technology, the very subjects that constitute the basis for all qualified IT jobs. According to a report by the Cisco Gender Initiative, the percentage of women in the technical and professional workforce throughout Western Europe is only 19%. Other studies show that at the end of the year 2000 only 5.6% of the internet networking professionals in Western Europe were women. Besides, students were not taught the right skills and too many of them break off their studies early. The Career space consortium showed in 2005
that curricula of many universities in Europe simply do not match the requirement profile for the ICT specialists the industry needs creating a difficult situation for the European industry in the future (Careerspace 2005).

Changes in required competencies and in the distribution of job functions

The workforce related to retail and wholesale in the traditional occupations is quite stable. In the period 2000-2006, there were only small changes in occupation. In general, in the old Member States, the number of managers, professional technicians, and elementary occupations were increasing a bit, while the number of clerks and service workers were decreasing a little. In the new Member States, the number of managers, professional technicians, craft trade workers, and elementary occupations were slightly decreasing, while the number of clerks, service workers, mechanics, business professionals, drivers, and mobile plant operations were increasing a bit (see Table 3).

Table 3   Occupation share changes distribution and trade 2000-2006

<table>
<thead>
<tr>
<th>Occupation</th>
<th>EU15</th>
<th>NMS</th>
<th>EU</th>
<th>Winning</th>
<th>Losing</th>
<th>momentum</th>
<th>Upcoming</th>
<th>Retreating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managers of SMEs</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>-1</td>
<td>-2</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other specialist managers</td>
<td>-1</td>
<td>-2</td>
<td>-1</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Health professionals</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Business professionals</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Other professionals and technicians</td>
<td>2</td>
<td>-1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Clerks</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-3</td>
<td>0</td>
<td>-1</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>Service workers</td>
<td>-3</td>
<td>1</td>
<td>-2</td>
<td>1</td>
<td>2</td>
<td>-3</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>Mechanics and fitters</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Craft and related trades workers</td>
<td>-1</td>
<td>-2</td>
<td>-1</td>
<td>-1</td>
<td>-1</td>
<td>-2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Motor vehicle drivers/mobile plant operators</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>Other operators</td>
<td>0</td>
<td>-1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>Elementary occupations</td>
<td>1</td>
<td>-1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

For occupations related to retail and wholesale the skill and education level seems to rise. Almost all occupations in the distribution and trade sector show a negative trend for low educated workers. The total share of low educated workers in the sector decreased with 5%. In the EU, especially low educated motor vehicle drivers / mobile plant operators and other operators lost share (11%). Both the craft and related trades workers and the other professional technicians remained stable, while the health professionals increased their share with 1%. Especially in the old member states the level of education increased. The catching-up in the new member states is taking place much slower.

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6 In EU22, 57% of the people employed had a medium education level (ISCED level 3+4) in 2006. In EU15 this share amounted to 52%, while in the new Member States 79% of the employees had this education level. Employees with a low education level (ISCED level 1+2) can mainly be found in the old Member States and especially in Portugal (72%) followed by Spain, Italy, and the Netherlands (39 to 45%). Employees with a high level of education (ISCED level 5+6) can mainly be found in Estonia, Lithuania and Finland (around 30%), while the average share of high educated employees in the commerce sector was 15% (EU22).
Box 10

The human resources structure in the CEE concerning retail is different from the EU15 situation. In the CEE countries senior managers are usually younger and, naturally, less experienced. Compared to their colleagues in the West they have a relatively low level of training. Sometimes they had only a few days for training-on-job for managers and even less for their hourly-paid employees (KPMG 2006: 15).
5 Institutional and structural requirements and implications

The retail business is very much structured and closed to new entrants. Introducing new players and new retail models requires some critical mass and massive investments of capital.

In general regulation is an important driver – or inhibitor – for the sector as it defines to a large extent the ‘freedom to operate’. Antagonistically to the driver internationalization, regulation is takes place at national or EU level. Specifically five types of regulation are distinguished:

- Regulation on labour defines to what extent retailers can use young and cheap labour and to what extent labour flexibility can be used.
- Regulation on shop opening hours defines the operating time for retailers.
- Regulation on location and zoning defines what type of stores can be located in what place.
- Regulation on health and safety influences the management of the value chain, as all products in the commerce value chain need to be followed throughout the chain (tracking and tracing, data protection, privacy).
- Anti-trust laws

Additional issues concerning the future of retail will affect consumers’ changing attitude toward the cost of retail forms. E.g. the consequences of discounters. Aside from buying in large quantities and avoiding extravagant retail displays, retail purchase goods that are produced in sweatshops in cheap labor countries where people are exploited, do not have insurance or social benefits, without any organization of labor, where unions are often forbidden and child labor is very common. But one does not even have to go to developing countries to encounter precarious working conditions. Several revelations in the media have lately scandalized the working conditions of retail personnel in discount stores. Extensive working hours, no unions, video surveillance of the staff in the store and in the back office, very low wages and pressures to generate a certain turnover coupled with the threat of being fired if the target are not reached have been reported lately. Customers are becoming more conscious, asking themselves if they would like to support such conditions or if there are reasonable alternatives without being necessarily more expensive.

Precarious production conditions exist also in the food industry. Extensive and intensive agriculture to satisfy the demands of European consumer for large variety, freshness and low prices produce transaction costs at other levels. Intensive agriculture combined with extensive cultivation of new soil (e.g. formerly rain forest etc.) contributes to erosion and climate change, worsening the conditions of living especially for people who cannot profit from economic growth (see Cotula et al. 2009). Transportation over long distance has the same effects. The use of chemistry of ensure increased agricultural yields and to make food more durable as well as the use of genetically modified organisms for such purposes is already evoking consumer concerns. The “smarter” consumers get, the more will they reflect the global consequences and possibly look for healthy, socially sound and environmentally friendly alternatives. When western society is starting to live up to their values, retail will have to react. Among the key objectives will be to support the eradication of poverty, protection of natural resources and creating sustainable production and consumption (see also GCI 2006).
5.1 Institutional change

Labor laws and opening hours

The labour laws and regulations concerning opening hours of shops vary considerably among EU countries. Labour regulations are organised at the national level, but also at the EU level minimum requirements regarding working and employment conditions and the information and consultation of workers have been defined. Nevertheless, some countries, e.g. the UK, have opted out on such policies. The commerce sectors strives for more flexibility in the labour market to be able to address the needs for labour in a 24/7 economy. The European Commission acknowledges this need for more flexibility in labour, while at the same time providing employees with appropriate levels of security. This is the concept of flexicurity (EuroCommerce, Annual report 2007/Action plan 2008) (van der Giessen et al. 2009).

Neo-liberal experts consider high labor cost and costs of fringe benefits too high in some countries such as Germany (up to 44% of the labor costs). Considering opening hours 80 hours are allowed in Germany and Austria; in Spain, France and the UK 144 (Pietersen 2004, 55).

Competition laws

Regulatory authorities are concerned that retail chains do not control too high a share of the market. To some degree, market share reflects retailers’ influence over consumers, competitors and suppliers. Since retail chains, especially in the food sector are more and more consolidation, some conflicts have occurred in the past and will be an issue for growth and innovation in the future as well. The competitive directorate of the European Commission has ruled on several cases during the 1990s of pan-European business making strategic acquisitions in different countries that have consequences in terms of buyer positions and influence over consumer choice. One example is the French merger of Promodès and Carrefour. The Commission was concerned that in three administrative Spanish regions post-merger market shares were particularly high. In addition, six out of seven hypermarkets would have been run by the combined consortium.

Privacy issues

As indicated in chapter 3.1, security issues play a role when it comes to surveillance of customers and employees in the store. Though several laws exist at national level, they are often outdated and cannot keep up with modern technologies and the privacy infringements they might cause.

More precarious in terms of privacy infringement, however, are e-commerce providers as there is a serious legislative gap how the privacy of the customer can be ensured, especially when they make their personal data public voluntarily (Giesecke et al. 2007).

5.2 Structural change

Some of the trends and strategies that have been captured in chapters 3 and 4 will determine the future of innovative products, processes and services in the retail and wholesale sector:

Big continues to be beautiful: globalization of the big retailers includes horizontal diversification and upstream integration, thus crowing out not only many small and medium-sized players but also many retailers. The realization of pan-European retailers is (still) prevented by complex ownership structures of some firms and little transparency in corporate and banking relationships. This makes it difficult for others to acquire or merge with them (Howard 2004).

Small retailers will survive as specialty stores (or with a certain value or location identity) offering added services (e.g. specialized knowledge)
Retailers will outsource more activities but at the same time offer more services. E-commerce and at the same time the delivery services will grow in certain fields, but not in all. E-commerce, however, will increasingly merge with delivery services (for example Otto and Hermes). In those fields, where e-commerce is successful it will be supplemented with M-commerce and T-commerce as soon as mobile technologies, internet and TV converge to tripleplay.

Besides e-commerce, other technologies will continue to transform the retail sector. Retail has become an information lead sector. ECR has enabled managers to better control the supply chain and to increase profit margins (Howard 2004).

In terms of store location, big hypermarkets will dominate the out-of-town areas while discounters, specialty stores and convenience stores will expand in the downtown areas and residential neighborhoods.

Requirements for adequate skills related to innovation and growth

The “e-Europe – go digital report” of 2002 suggested that “deep organisational changes are required and new skills are needed to fully exploit the new technologies” (e-Europe 2002: 8). One of their major findings is that “Supply Chain Management and Customer Relationship Management are examples of activities where professionals with no ICT sector experience have to adapt to the use of ICT solutions to increase productivity and competitiveness.” (e-Europe 2002:10) Especially in the “bricks and mortar” companies the share of ICT related business process in the B2B areas will rise. There is an increasing need for effective online content and this is considered a key driver for skills demand in the retail sector. Evidence from several previous studies suggests that ICT workers need to have a broader range of skills than just ICT expertise and this is hampering employment opportunities. Especially in retail, soft skill and knowledge of the supply chain management will be more and more required as simple tasks can be fulfilled in an automated way.

There are also core retail competences that are demanded of employees to a consistently high standard. These include sales, visual merchandising and merchandising, property management, money management, dealing with security/crime and health and safety. The nature of the skills and employment issues and the types of interventions that are suitable to encourage change will be influenced by the size and location of the retailers.

Key user industries such as retail require funding for specialized training, awareness campaigns, demonstrations and the adoption of applications. At education and training level the retail sector requires targeted vocational education and training curricula, certification of training programs and on the job training schemes. In the future, more advanced ICT skills will be required – at any level.

Communication standards

The retail industry has tried to harmonize its RFID use by efforts of standardisation. In the last years, many companies have complied to EPC Gen 2 which is a global network standard. However, some of the very big players have developed their own standards, including Woolworth’s, Scottish Courage, Marks&Spencer, Wal-Mart, Tesco and Metro Group. With the exception of Metro, progress is perceived by experts as being slow and problematic. The RFID hype that was ignited mostly by Wal-Mart’s initial announcements might lead to a loss of interest in the technology when such projects fail to materialize in the expected timescales. Consequently, other companies will delay investment in RFID, finally failing to reap the benefits that they expected and that can only accrue if a critical invests in the technology (see also IBM 2004).
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Infrastructural requirements

Band width

In order to advance with T-commerce the proper infrastructure providing band width is needed. In Germany, for example where the provision of broadband is rather low, innovative retailers like Otto are frustrated that they cannot advertise with moving images. Only tripleplay offers an alternative, because the combination internet, TV and phone can use cable TV as well phone line infrastructures. Figure 11 shows the broadband penetration in OECD countries: some small countries clearly lying ahead of the countries representing the big retailers.

Figure 11

![OCD broadband penetration and GDP per capita](chart.png)

Source: OECD

Logistics

Some industry observers are concerned that decreasing availability of energy resources, strict mobility regulations of urban communities and more home shopping will eventually have effects on logistics: retailers will move from brand centric logistics to central location logistics, that is various goods and brands in a near-by distribution center. Strategies for this may possibly include consolidated distribution, dynamic route planning, and more effective transport sharing and backhauling (CGI 2006). These constraints also raise the question of what will be the future location of shops.
6 First elements of scenarios

This report does intentionally not generate new scenarios in order not to pose a bias to the scenario workshops to be done in the next work packages of Europe Innova. Instead four scenarios are presented here that resulted from a projected conducted by TNO recently on skills and the future of the distribution and trade sector (see von der Giessen et al. 2009).

Box 11

Scenario 1: Shop Around the Clock
Consumers are in the lead. They know exactly what they want and need. They can consume anywhere, anyplace, anytime. They can do this both in virtual and physical stores. Technological developments will enable a one-on-one relationship with the consumer, personalized marketing and sales and mass customization driven by more knowledge of consumers. Strong market segmentation and mass customisation will be supported by technological solutions which enable a full multi-channel sales and marketing strategy. Fine tuned logistics and optimised supply chain management make it possible to deliver goods anywhere anytime in an efficient way. The full application of mass customisation requires full flexibility in everything: flexible labour force, flexible opening hours, flexible (retail) locations, etc. Governments acknowledge this need for flexibility and design flexible and harmonised regulations in such a way that this need for flexibility is supported. Global competition will be fierce, but open because there will be no hindering regulations.

Environmental protection is limited in this scenario, as is the protection of employees who increasingly hired on flexible contracts. Emerging economies offer many opportunities for growth and the emerging markets will be served through local and multinational companies as well as through virtual stores. As natural resources are available and affordable, products can be moved easily and at low costs around the world.

Scenario II: Shopping Malls Rule
Technological change is happening at a slower pace and consumers are hesitant to adopt all the technological possibilities. Consumers will use the Internet for specific products only (e.g. travelling, books and music), but they will mainly shop in physical stores. Consumers are looking for a full shopping experience: shopping is fun and part of entertainment and consumers will combine shopping with other entertainment experiences (e.g. going to the movies, sports, games and casino). Large shopping malls will address this need for a full shopping experience. Shopping malls deliver more than just floor space; it’s a world full of experience, including other types of entertainment. Consumers will see these shopping malls as a day out, not necessarily spending a lot in the stores (window shopping is also fun shopping). The establishment of large shopping areas is not hindered by regulation. Regulation on location, labour and opening hours is loose and flexible and shopping malls will serve their clients 24/7.

Regulation with regard to the position of employees is weak. There are no restrictions on the expansion of shopping malls with possibly negative implications for the environment. Although there will be global competition, retailers will increasingly serve their local or regional markets, because this makes it easier to address local customer needs. Companies that do not already have business in emerging markets will not try to start this as competition in these markets will increasing, mainly from the local companies. Natural resources are scarce and expensive, which will stimulate companies to focus more on the regional markets.
Scenario III: **V-stores**
Restrictive regulation on location and labour in the EU and technological change promote the rapid growth of e-business and the emergence of virtual stores. There is a 24/7 possibility of virtual shopping, but delivery is restricted to certain hours. Nevertheless, almost everything is purchased via internet, not just books, music and travelling. E-businesses are serving worldwide, and also increasingly provide emerging markets as the Internet is increasingly adopted there as well. Transport costs are low because of affordable fuel prices. Nevertheless, international business can be restricted by national and European regulation on taxes, safety requirements and security. The position of employees may be strengthened in this scenario as the competitive pressures are severe than in the previous scenarios. Physical expansion of retail outlets will be limited.

This may be beneficial for the environment due to reduced “greenfield” investments, but it may also lead to a deterioration of the quality of city centre shopping areas. The virtual stores offer tailor-made products and services and the fast technological developments and adoption enable one-on-one relationships with the consumer and support full mass customisation. The extensive adoption of e-business could result in the establishment of virtual stores by established and new retailers, but it could also result in disintermediation of retail and wholesale as manufacturers establish direct relationships with consumers.

Scenario IV: **My Specialty Store**
Technological developments are relatively slow and people are not really interested in adopting all kinds of high-tech solutions for their shopping. E-business will remain a niche-business, mainly used for specific products, e.g. music, books and travelling. Consumers like to shop, but not necessarily in large shopping malls. Large shopping areas which are open 24/7 are also restricted by rather strict regulations on location, labour and shopping hours. Consumers will look for smaller, specialised shops, located close to the consumers, in town centres and neighbourhoods, but also close to the local producers, for example farm shops. Quality of life and sustainable production and consumption will be important values for consumers. Retailers will have a one-on-one relationship with consumers and will know quite well what their customers want, but this is based on customer relationship management by physical contact and small networks rather than by automated customer information systems.

Focus in the sector is on quality of life, ethics and sustainability. Companies will focus on the local and regional markets and not necessarily on global and emerging markets. This focus on local and regional markets is also driven by high transport costs. The position of personnel working in the retail sector will improve due to less intensive competitive pressures and an emphasis on smaller scale, high quality shops providing high levels of service. Finally, developments in this scenario will lead to a differentiated, high-quality shopping centres in the cities.

These scenarios are not meant to be exhaustive or representative. They are simply examples resulting from a previous complex scenario development project. In some respect they present conventional views. What has become clear by the scenarios and also by the previous chapters is that – from the consumer’s perspective – shopping is highly attached to individual or community values. Retailers today are getting more conscious of such values and reacting to them.

It would however be legitimate to think in other – or even contrary – directions as well. For example, high tech could be combined with green retailing. A clientele that is well educated and represents values of sustainability could also promote the deployment of modern technologies. At the same account, neighborhood shopping can be on the rise as small and micro shops are founded by a new generation of entrepreneurs, appreciated by consumers who have a high degree of identity with their neighborhood and prefer to have everything in walking distance. This
might be a “bicycle district” or a community that prefers to live without cars. Opening hours can be friendly to the entrepreneur and their employers and after hour shopping is made available by online shopping – offered even my small neighborhood stores. Weekly deliveries for working people, elderly as well as young families are common…

Scenarios could also take up more playful features, e.g. make shopping for the consumer a health-related experience. Going into a supermarket could be accompanied by a mobile shopping assistant that finds the right ingredients for a diet for the shopper’s ideal weight, calculates calories, informs about ingredients and allergies. It informs the customer on fresh produce and on the origins of vegetables and fruit, suggesting combinations with other ingredients as well as recipes. It recommends goods that contain the necessary vitamins and minerals to complement the diet. The shopping assistant also leads the customer to the proper isle to find dietary supplements, low calorie beverages etc.
7 Key questions

The following key questions reflect major uncertainties encountered in the analysis of the emerging innovation patterns in the wholesale and retail sector and could be addressed at the foresight workshop:

- Relation between wholesale and retail: under what conditions will wholesale be substituted, under what conditions will retail be substituted (company-customer relations)?
- (How) Will micro-enterprises be able to survive?
- Will EU-wide regulations harmonize opening hours, labor relations, skills and training requirements, locations, mergers & acquisitions, etc.?
- How can skilled service be assured if jobs in retail are the least paid and less skilled?
- Where is the future location going to be considering increasing fuel prices, demand for size, assortment and freshness, and time pressure on consumer and retailer side?
- Will customers live up to their (changing) values and be more conscious of the entire production and supply chain or will price have the last say?
- (How) Will the aging society change demand and retail?
- What kind of clientele is going to adopt Web 2.0 features?
- (How) Will retailers/wholesalers find a common best standard to create an optimized information flow?
- How can consumers’ privacy be better protected and how can they be made aware of the precarious consequences of making private data public?
- Given the recent and future developments in retail: what are future challenges to consumer organizations/groups?
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The Networking Skill Shortage – How women can narrow the gap


Secotral Innovation Foresight Interim Report – Future Innovation
## Annex 1: Definition of the Sector

### Table 1.1 Statistical classification distribution and trade sector

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<thead>
<tr>
<th>NACE Rev 1.1</th>
<th>NACE Rev 2</th>
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<tr>
<td>Wholesale and retail trade of motor vehicles and motorcycles</td>
<td>45. Wholesale and retail trade and repair of motor vehicles and motorcycles</td>
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<tr>
<td>50. Sale, maintenance and repair of motor vehicles and motorcycles; retail of automotive fuel</td>
<td>45.1 Sale of motor vehicles</td>
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<td>50.1 Sale of motor vehicles</td>
<td>45.2 Maintenance and repair of motor vehicles</td>
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<td>50.2 Maintenance and repair of motor vehicles</td>
<td>45.3 Sale of motor vehicle parts and accessories</td>
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<td>50.3 Sale of motor vehicle parts and accessories</td>
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<td>50.4 Sale, maintenance and repair of motorcycles and related parts and accessories</td>
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<td>50.5 Retail sale of automotive fuel</td>
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<td>Wholesale trade</td>
<td>46. Wholesale trade, except of motor vehicles and motorcycles</td>
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<td>51. Wholesale trade and commission trade, except of motor vehicles and motorcycles</td>
<td>46.1 Wholesale on a fee or contract basis</td>
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<td>51.1 Wholesale on a fee or contract basis</td>
<td>46.2 Wholesale of agricultural raw materials and live animals</td>
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<td>51.2 Wholesale of agricultural raw materials and live animals</td>
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<td>51.4 Wholesale of household goods</td>
<td>46.5 Wholesale of ICT equipment</td>
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<td>51.5 Wholesale of non-agricultural intermediate products, waste and scrap</td>
<td>46.6 Wholesale of other machinery, equipment and supplies</td>
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<td>51.8 Wholesale of machinery, equipment and supplies</td>
<td>46.7 Other specialised wholesale</td>
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<td>51.9 Other wholesale</td>
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<td>Retail trade</td>
<td>47. Retail trade, except of motor vehicles and motorcycles</td>
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<td>52. Retail trade, except of motor vehicles and motor cycles; repair of personal and household goods</td>
<td>47.1 Retail sale in non-specialised stores</td>
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<td>52.1 Retail sale in non-specialised stores</td>
<td>47.2 Retail sale of food, beverages and tobacco in specialised stores</td>
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<td>52.2 Retail sale of food, beverages and tobacco in specialised stores</td>
<td>47.3 Retail sale of automotive fuel in specialised stores</td>
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<td>52.3 Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles</td>
<td>47.4 Retail sale of ICT equipment in specialised stores</td>
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<td>52.4 Other retail sale of new goods in specialised stores</td>
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<td>52.6 Retail sale not in stores</td>
<td>47.7 Retail sale of other goods in specialised stores</td>
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<td>52.7 Repair of personal and household goods</td>
<td>47.8 Retail sale via stalls and markets</td>
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Source: Eurostat (2007)