

# Investigative study into E-commerce - from the Perspective of Logistics and Transport

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# **Investigative study into E-commerce - from the Perspective of Logistics and Transport**

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## Foreword

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At the time that DGG gave AVV the task of carrying out this investigation into the effects of e-commerce on goods transportation, mid 2000, the IT sector could be characterised by an unbounded enthusiasm. A half year later on, the first cracks appeared in it. There was the World Online disaster, falling shares in IT funds and new economy businesses started having difficulties. This report is intended to put things into a perspective which makes sense.

Common sense has emerged quickly, specifically within the world of transport, about the assumed high impact of e-commerce and especially the Internet on relationships in between businesses, and with consumers. Recent publications contain many statements about the effects of e-commerce on logistics and transport. What is going to happen? Will relationships along the logistics supply chain become less tight, as is often suggested in the literature? Will e-commerce give the decisive push towards building new, advanced logistics systems, as many consultants would have us believe? And will e-commerce end in an explosion of local and regional transport?

In the world of e-commerce there is a lot of movement and insecurity. This report tries to bring some focus to the above questions instead of answering them once and for all. Rather, it is about the determining factors in the world of e-commerce and the way in which these could influence goods transport and ultimately the policy for goods transport.

To answer these questions an extensive study into written material about e-commerce and its importance for logistics and transport was started during the second half of 2000. Dick van Duijn was the commissioner from the DGG, with Pim Breek, Jan-Bron Dik, Geert Draijer, Elly de Gooijer, Gaeco Jacobs and Nicolette Koenekoop as participants in the advisory committee. Stef Weijers was AVV's project leader, with Paul Huijbregts, Dik Rouwenhorst and Sjors Rozemeijer as team members.

E-commerce justifiably receives a lot of attention. This report shows that it is an important development, but in a different way to how we had originally thought. This investigation demands a follow-up. We hope that this report will contribute to a better understanding of e-commerce and what lies behind it.

Ir. H. Luikens  
Chief Engineer and Director Transport Research Centre (AVV)

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# 1 Introduction

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In this chapter you can read about the background to this project, as well as the questions that flowed from it and the way in which this report answers those questions.

## 1.1 Rationale

Is e-commerce going to boom? The idea that this is to happen has quickly become common property. Is that an acceptable thought? And if e-commerce does indeed conquer the market, is it going to turn the relationships between companies and their relationships with consumers upside down? And what does that mean for the transport of goods?

In mid 2000, the Directoraat-Generaal voor het Goederenvervoer (DGG - V&W, the General Directorate for Goods Transportation) asked the Adviesdienst Verkeer en Vervoer (Advisory Service for Traffic and Transport) to conduct an initial investigative study into e-commerce. From DGG/V&W's perspective it is important that an image forms about how developments within e-commerce may directly or indirectly influence goods transportation policy. In other words, *the size, importance and the possible effects of e-commerce on the development of companies in general, and the logistics supply chain and transport in particular, are not at all clear*. If the effects of e-commerce are large, then what are the implications for V&W's goods transportation policy?

## 1.2 This study

This problem cannot be solved all at once based on a short study. In order to help remove uncertainties like those mentioned above, this study has been set up with the following question as its underlying premise:

*What can be said about the implications of e-commerce for logistics and transport based on reading relevant publications?*

A great deal has been written and extensive recent coverage has been given, but it is not always unambiguous. As a result, it was decided to answer the study's underlying question with a study of the available literature. A choice was made not to add any new information to the large quantity that is already available here and there, but to separate the proven from the unproven within the literature, and to place them in perspective.

To support this literature study, a number of interviews were held with experts. Finally, a number of experts were asked to provide their vision of e-commerce in an essay or paper, from the perspective of logistics and transport.

## 1.3 Basic principles

In order to separate the proven from the unproven in the literature, the distinction between what is factual and what is assumed plays a large role in this study.



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A choice was made for a broader perspective, rather than restricting it to the electronic medium, as this provides a better pretext for future forecasts. To this end the following basic principles for this study are used.

**1. Searching for why:** Principle one of this study is to try and answer the question about the reasons the different parties have that induce them to enter into (different kinds) of e-commerce. This is in order to understand the dynamics behind e-commerce.<sup>1</sup>

**2. Searching for the level of harmony:** Principle two is the question as to which opposing forces will take place *within the same* businesses; the purchasing function often conflicts with the logistical function. A first glance at studies into e-commerce shows us that these kinds of questions are rarely posed.

**3. Looking for the anticipated reactions and counter reactions:** We often assume that new activities or newcomers set new trends, and to some extent that is the case. However, experience shows us that counter actions by parties whose position is being affected, can turn the tide, or at least influence it, permanently or temporarily.

#### **1.4 Study framework**

The study framework that is being used in order to be able to answer the study's questions is derived from the above-mentioned principles. The study framework was previously developed by the NEA, a traffic, transport and logistics knowledge provider, in collaboration with Cranfield and V&W.

The main thrust is as follows.

A business - a producer, chain-store retailer, transporter and so on, moves within its own particular field of influence. Some forces lead it to change (*drivers*), whilst other forces prevent specific solutions (*barriers*), and yet others make them possible (*enablers*). Against this background the business develops its logistics strategy (articulated or otherwise). In accordance with that strategy, or at least that is the *intention* of the business, it develops its logistics system and structure, which express its position in relation to the other partners in the supply chain as well as the functional relationship between the manufacturing locations and the marketplace. This system and structure also show the distribution points of the products and the receiving points of the raw materials and unfinished goods. This logistics system takes shape in a spatially coherent transport system (with its counterpart in a spatially structured storage system of distribution centres). In fact, by this transport system we mean transport flows between the places where production takes place, the places where supplies originate, and sales locations. These flows are usually expressed in numbers of transport movements, kilometre tons, load factors, and so on.

This thinking process is briefly summarised in the figure on the next page.

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<sup>1</sup> OECD, 2000



Figure 1  
Theoretical outline



Source: PblVVS / NEA / Cranfield, 1994

An example. PC manufacturers were forced to seek their own place within the market, partly due to the independence of the retailers whom they encounter, as well as their distance from the market (*driving force*). That led a few PC manufacturers to serve clients directly by means of e-commerce. This was possible due to the emergence of information technology and the Internet (*enabler*). Other PC manufacturers do not trust the opportunities for fraud and payment problems and that makes it more difficult for them to go down the e-commerce route straightaway (*barrier*). Many other examples can be imagined. The mix of these forces for change is unique for every company.

The thought process presented above forms the thread running through this report. Before examining the elements from this framework step by step, the question as to what e-commerce is and what it is not will need clarifying: it needs a definition.



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## 2 What is e-commerce?

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E-commerce is trade by means of an electronic medium. Up to this point opinions are in agreement. But what falls within its scope and what lies beyond? If BMW buys its bumpers electronically through the electronic marketplace *Automotive eXchange Network* it is called e-commerce. However, if someone puts his second-hand car up for sale over the Internet, negotiates with potential buyers, but is not able to sell it, can this still be called e-commerce? Some think it can, others disagree. In this chapter we shall juxtapose the different definitions that are used in the literature, and we shall indicate which definition serves as the best starting point to determine possible changes in logistics and transport.

### 2.1 How should e-commerce be defined?

There is a range of definitions to be found in the literature when looking at e-commerce. It becomes apparent that these definitions can be classed according to four different approaches.

#### Approach 1: the medium

According to the OECD, the Internet is the driver behind the interest in and discussions about e-commerce.<sup>2</sup> It is the medium for e-commerce that appeals most to one's imagination, but Electronic Data Interchange (EDI) or interactive TV can also be used for e-commerce.

More recent media all appear to have just one advantage when viewed against older communication means such as face-to-face encounters and the post. The Internet combines a few of these individual advantages of the more recent media.

Interaction can take place more easily via the Internet with a great many potential participants and large-scale access.

Given the scale of the Internet, new opportunities for interaction and transaction are created, of buyer and seller in constant interaction.

The Internet does have its disadvantages as well. Verhoest, Leijten and Whalley state that the layered nature of the Internet is a short-term advantage that enables various applications and services to be designed. It is possible to switch quickly from one application to another. However, they consider this flexibility to be a disadvantage in the long-term, because it creates uncertainty for the future about what the standard is to be.

They list the following as further disadvantages of the Internet:

- unsatisfactory possibilities for making secure and easy payments, including people's perception that this is the case;
- limited identification of buyers and sellers: can we be sure that the person with whom we are negotiating and with whom we reach an agreement is truly the person or party we imagine him to be?

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<sup>2</sup> OECD, 2000



- intellectual property rights that are crucial for further innovation in e-commerce are insufficiently guaranteed - advantages are often extracted from innovations by preventing others from imitating the innovation (by taking out patents and copyrights), whereas the Internet encourages openness;
- the risk of congestion on the net.

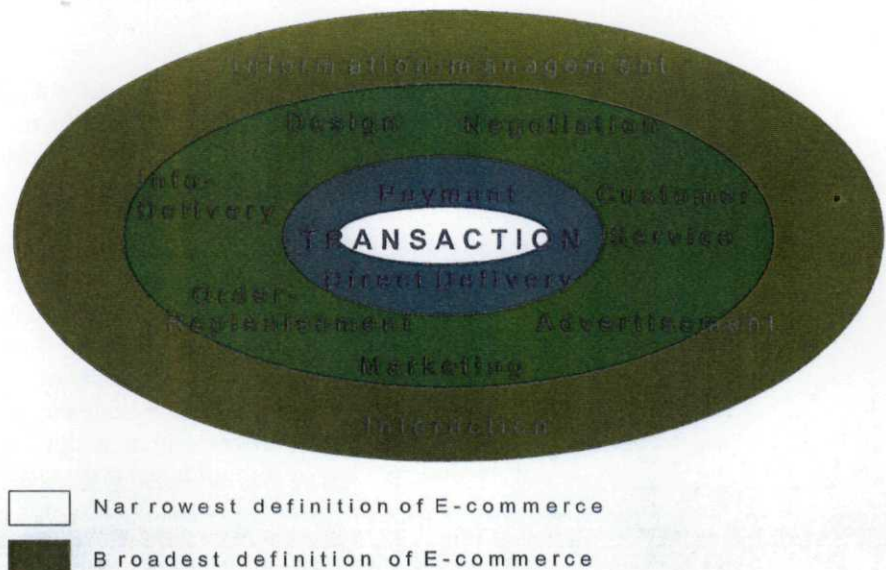
On balance, they expect that as the degree of digitisation grows, technical problems will also increase.<sup>3</sup>

#### Approach 2: the activities

Defined in its strictest sense, e-commerce is a *legal* act. Neither the activities that precede the legal transaction, nor those that follow it, are considered. A broader definition is the one in which the transaction is viewed as an *economic* act. Then the activities that precede and follow it, such as payment and delivery, but also the provision of product information, marketing, client service and so on, are considered to be inextricably bound to it. Many of these activities can also take place electronically.<sup>4</sup>

Because this study does not only pertain to the transaction, but also to its relationship with transport, the broad as well as the narrow definitions are relevant. In figure 2 the different definitions are summarised.

Figure 2.1  
The circles of e-commerce



#### Approach 3: parties

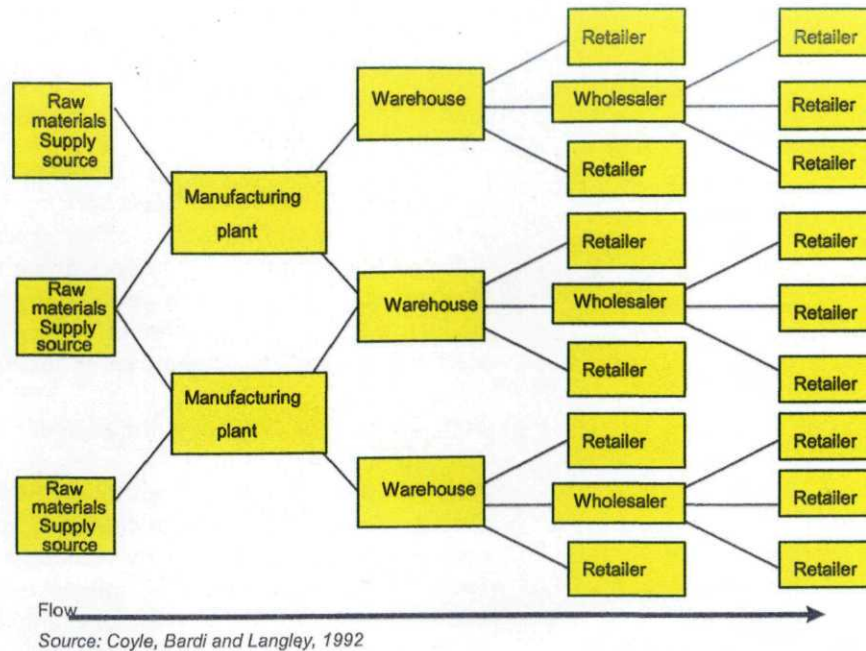
E-commerce's character can be identified in part by answering the question of who is trading with whom. The following figure illustrates the nature of the partners who may be involved and how relationships can progress.

<sup>3</sup> 1999, p.359/361

<sup>4</sup> For this IG&H use the term e-business. For them, e-commerce is a transaction. In addition, the term *e-logistics* is used. For them, this means all logistical activities that, broadly speaking, are necessary to make e-commerce possible: transport, storage, information provision. Their definition makes it irrelevant whether activities are electronically led or not (IG&H, 2000).



Figure 2.2  
Example of partners in a logistical chain



Businesses and consumers are the main categories with which the literature is concerned. In principle there are four options:

*Business to Business (B2B)* means that business is conducted electronically between businesses. It forms the largest segment of the four and, in part, it expands on Electronic Data Interchange (EDI).

*Business to Consumer (B2C)* relates to the electronic business of companies that is aimed at consumers. Amazon.com is the most well known example.

*Consumer to Business (C2B)* is the reverse of what we are used to. Consumers indicate individually or collectively which products and services they require, under which conditions and for what prices, and ask companies for quotations and/or delivery. Businesses such as letsbuyit.com fall within this category.

*Consumer to Consumer (C2C)* relates to electronic trade between individual consumers. In fact, these are advertisements on the Internet: the e-bays. The four options are charted in figure 2.3.

Figure 2.3  
E-commerce defined using the different partners as starting points

	Business	Consumer
Business	B2B	B2C
Consumer	C2B	C2C

As the strongest drive towards e-commerce appears initially be concentrated in the business world, this report will focus on B2B and B2C. Of course, the other segments are worthy of a future study.

Aside from the distinction between business and consumers, a distinction is often made between parties who have an IT background or not, ie whether they are dotcom companies or not. Various dotcom companies provide a

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website in order to function as an electronic marketplace, as so-called *e-marketplaces*. They offer businesses and consumers an opportunity to conduct e-commerce.

Within these dotcom companies a distinction is made which is analogous to the *new economy* and the *old*. *Clicks&bricks* (or *clicks&mortar*) are dotcoms that were started by creating a *front office*, symbolised by the mouse click. They subsequently added a logistical *back office*, symbolised by the brick symbol. By contrast, there are the businesses that went from the old economy, or traditional trade, onto the Internet, ie from their existing back office to an electronic front office. They are called the *Bricks&clicks* (or *bricks&mortar*).

Both kinds will be included in the analysis.

#### **Approach 4: the nature of products and services**

Dialogic distinguishes between *direct* and *indirect e-commerce*. Direct e-commerce applies to the delivery of intangible goods such as music in MP3-form, information and software. Indirect e-commerce pertains to electronic trade in tangible goods, such as, for example, music in CD form (Dialogic, "Controversies and (non) policy issues in E-commerce, a telematics assessment" 1999). This relates to the nature of the product.

Aside from the distinction between material/tangible and intangible, including digital, electronic products, a second distinction is relevant, ie the nature of the information.

From the perspective of business management, the automation of information flows has brought about a division between the treatment of *standard* information flows and the treatment of the *deviations* from them. EDI made it possible to deal with the standard information flows automatically. As a result, rather than spending all the time dealing with standard cases, it was spent dealing with the special ones such as defects, special orders, mistakes, calamities and so on.

Finally, the nature of the transaction is relevant. Catalogue e-commerce relates to trading in goods and services that are relatively standard in quality, with more or less fixed prices. The client can, as it were, leaf through the catalogue and place an order. At the beginning of the 1990s large manufacturers in particular, with a network of suppliers, were active in setting up EDI bilaterally with the other companies in their logistics supply chain.

Verhoest states that standard transactions form a relatively large part of the total costs. At the same time they are relatively easy to digitise and automate, which can lead to attractive cost reductions.<sup>5</sup>

With auction e-commerce the person offering the goods is not concerned with a standard sale, but rather, for example, to get rid of overstocks, to get hold of returned goods, or to place a new product on the market. This kind of e-commerce generates transport flows that are obviously less predictable than catalogue e-commerce.

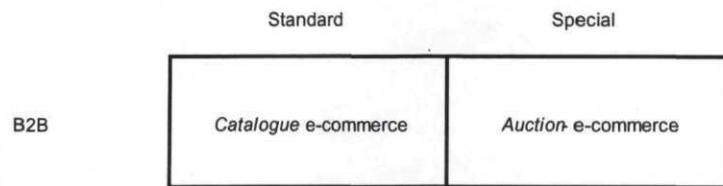
Usually, selling more specialised products demands rather large information costs, which is largely because of the preparatory phase of the transaction: the negotiations, proposal processes, provision of legal cover, and so on. Digitising a transaction will have a relatively small effect on the total costs (Verhoest,

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<sup>5</sup> Verhoest, 1999.

ditto). At this point e-commerce is more a strategy aimed at the inventory than at transaction costs.

.....  
**Figure 2.4**  
Two kinds of Business to Business



This report will deal with both kinds of e-commerce.

## 2.2 In conclusion

In this chapter an attempt has been made to clarify the confusion of definitions and terms that are used. The study of the literature in question is exploratory. That is the first argument supporting the use of a broad definition. In addition, a search for the effects on transport was made; these can be direct, but also indirect. This is also a reason to opt for a broad definition here.

In this report

1. not only are applications of the Internet looked at, but also other applications of e-commerce, such as EDI;
2. e-commerce is not only viewed as a legal transaction, but the activities and interaction that precedes and follows it are also examined;
3. B2B and B2C are the main focus;
4. a wide range of products is looked at - digital and physical, standard and unusual.





Investigative study into e-commerce

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### 3 Statistics and expectations

A first glance at the literature gives the impression that e-commerce, and specifically Business to Business, now forms a significant part of the trade. Last year Forrester calculated it to be 70 billion dollars. Boston Consulting arrived at a sum of 1000 billion dollars.

Figures seem to vary widely, which is also true for savings produced by e-commerce. Were savings of e-commerce forty percent, as some companies report, or less than one percent, as reported by others? The varied nature of the figures renders the question of which numbers are real and what they are based on an urgent one. It is remarkable that practically all available figures come from just a few consultants. Many figures seem to come in particular from Forrester and Gartner. They produce statistics on behalf of clients who are looking for a market for their products or services. There are few figures produced by independent organisations.

In this chapter the various statistics and expectations will be juxtaposed, and explanations for the variations will be sought.

#### 3.1 Absolute size and growth

The table below contains an overview of the estimates made by various consultants about the size and growth of e-commerce.

**Table 3.1**  
Estimates by consultants of e-commerce  
worldwide in billion dollars

Billion \$	1999	2003	Average annual growth %
E-Marketer	98.4	1 244	89
IDC	111.4	1 317	85
ActivMedia	95	1 324	93
Forrester Low	70	1 800	125
Forrester High *	170	3 200	108
Boston Consulting Group	1 000	4 600	46

Source: cited in E-Marketer (2000) and Boston Consulting Group (1999b)

\* including Internet-based EDI

The table makes it clear that statistics concerning the size of e-commerce vary greatly. The growth figures are without exception astronomical, although these too vary greatly: from 46 to 125 percent per year. The OECD also states that the value of transactions via e-commerce doubles every twelve to eighteen months.

The literature indicates that the variance in the figures is to do with differences in definitions, approaches to research and scope. However, most sources do not have any *explicit* information about these things. As concluded by the OECD earlier this year, the detailed rationalisation behind research into e-commerce is

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not often made public.<sup>6</sup> Most calculations or estimates were made by the consultants on behalf of clients who wanted the market to be studied.

In general, the figures in the literature about actual e-commerce *growth* are almost always estimates. It is not often indicated whether figures regarding its *size* are based on observation or estimates. The range of the graphs that are shown rarely goes back further than a year or so. There are hardly any recognised statistics. In some countries they are working on drawing up a statistics base. In The Netherlands the Ministry of Economic Affairs is seeing to it.<sup>7</sup>

The size and growth of e-commerce is almost always expressed in financial terms. Details about the number of products, let alone kilometre tons, are missing.

The greatest portion of e-commerce transactions takes place between businesses (B2B). At present this accounts for around 70 to 85 percent of all e-commerce. The OECD expects this share to increase in the years to come, because B2B grows faster than B2C. It argues that this faster growth is made possible:

1. by the shift from trade via existing EDI networks to those via the Internet,
2. by the opportunities for cost reduction in the purchase and distribution, and
3. through the opportunities for more efficient and effective service provision.

### 3.2 Share of the economy

The literature gives the picture of e-commerce being fairly extensive, or at least that it will be soon. Now we know that we must be careful with figures about e-commerce, because it is not clear how the studies were conducted and what is understood by e-commerce in the different quantitative studies. But what does 'fairly extensive' mean: what is e-commerce's share of the total economy?

It is difficult for B2B to find out about figures regarding its share of the economy. Andersen Consulting argues that, at present, 97 percent of all companies in Europe are involved in e-commerce in one way or another, particularly with marketing and sales. But it is not clear whether this relates to advertisements, data gathering or transactions, etc.<sup>8</sup>

Forrester expects that in 2005 six percent of all European B2B trade will take place via e-marketplaces.

The size of B2C transactions in The Netherlands prior to 1999 is estimated to be 182 million dollars. This amounts to 0.34 percent of the total transaction volume in the retail sector. By way of comparison, the estimated B2C transactions were worth 1199 million dollars in Germany and in France they were worth 345 million dollars.

According to The Economist, B2C e-commerce amounted to 0.2 percent of the value of all retail sector sales throughout Europe in the same period, and in the US they amounted to 1 percent.<sup>9</sup>

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<sup>6</sup> OECD, 2000

<sup>7</sup> Dialogic 1999

<sup>8</sup> Andersen Consulting, 2000

<sup>9</sup> February 1999

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According to Gartner the worldwide size of e-commerce in 1999 amounted to 150 billion dollars. Eighty percent of that was B2B.<sup>10</sup>

### **3.3 Conclusion**

We can conclude that statistics only provide limited clarity about e-commerce's share of total transactions. To a large extent, the literature does not provide a clear description of what is understood by e-commerce and what the underlying basic principles of any research are. B2C's share of the retail trade seems to be extremely limited.

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<sup>10</sup> Gartner, August 2000

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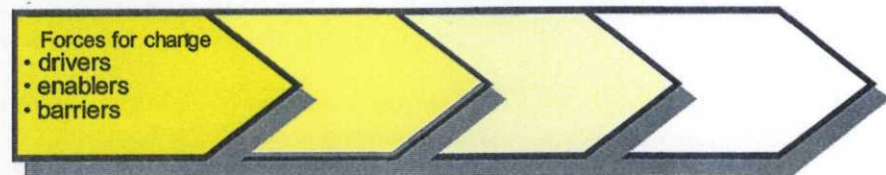
## 4 Business to Business (B2B)

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This chapter deals with texts written about Business to Business according to the research procedure that was described in Chapter 1.

### 4.1 Forces for change

#### 4.1.1 Drivers



The literature lists various forces that are decisive for whether individual businesses move towards e-commerce or not.

One of the most important forces is the idea that not a single company can do without the Internet. Andersen Consulting researched more than 600 large companies in Europe, North America and South Africa. This constitutes one of the relatively few representative empirical studies. The study shows that the main reason for two thirds of these companies to be involved in e-commerce themselves is the fact that *other* companies are involved in B2B. More than half of them do not know if their initiative is proving to be successful or not. *Not wanting to miss the boat* seems in practice to be a widespread driver.

By contrast, many articles emphasise the fact that once companies embrace e-commerce, they are obliged to come up with innovations and are forced to think about the way in which business is conducted and opportunities exist to build up different kinds of relationships with suppliers and buyers. Within the literature the following groups of *internal driving forces* are named:

#### a) Aiming for cost reductions

Reducing purchase costs of raw materials, after-sales costs, transaction costs, more efficient supply chains, and so on.

#### b) The need for increased opportunities to influence the logistics supply chain

The need to reduce inventories even further and to tune internal business operations to each more finely.

#### c) The need for information to influence the supply chain

Manufacturers need on-line real-time information about buying habits of individual clients (mass individualisation). That offers the opportunity for customer loyalty: direct on-line connections, open systems with individual

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clients using the Internet as their ecosystem, offering the possibility of one-stop shopping: offering everything through one Internet site.

#### **d) Shortcomings of current systems**

EDI is considered to be inflexible: a closed system of suppliers and buyers where the end user is shut out of the value chain, with high implementation costs. The shortcomings of ERP applications are also considered to be manifold.

Aside from the internal business reasons mentioned above, there are *external drivers* bringing companies to e-commerce such as:

1. the **increasing pace of change** in general, but specifically the increasing demand for reaction speed as well;
2. the increasing **geographical** scope of business ventures and deepened internationalisation of markets;
3. the increasing demand for **reliability** and quality of products and services;

Finally, there is an extremely large quantity of written material about drivers. There are various case descriptions, most of them about American success stories. There is only a limited amount of empirically representative material.

#### **4.1.2 Enablers**

Of course, the Internet is the most important *enabler* allowing companies to do e-commerce. The Internet acts as a catalyst. The literature indicates that companies can integrate better with other partners thanks to the Internet, and can increase their geographical scale more easily. The liberalisation of the national telecom sector also plays its part. Compared to EDI, the Internet is more flexible, cheaper, demands less specific applications and is suitable for a long logistics supply chain. E-commerce has an internal company component in the sense that internally, optimal communication and exchange of data components can take place on-line and in real time. That strengthens the tendency towards integrating various departments such as logistics, production, finance, purchasing and so on.

#### **4.1.3 Barriers**

The largest e-commerce players at present are North American companies. Their B2B activities are centred in their own continent<sup>11</sup>. The most significant barriers are:

##### **a) Resistance from traditional business culture**

In many countries great store is set by traditional trade practices and long-term relationships. The Japanese, French and Germans way of building up relationships and sustaining them is named by way of reference. It is thought that e-commerce will lead to many changes in relationships and that this will then meet with some resistance. However, Andersen Consulting considers the business culture in Europe to be potentially advantageous. Captains of industry who have been interviewed indicate that companies in Europe have been forced in the past to learn to deal with different (national) business cultures.

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<sup>11</sup> The Economist, 26 June 2000



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Some authors argue that within companies cultural resistance to communicating in a more interactive and open environment can emerge. The question is whether this weighs heavier in all cases than the idea that the Internet brings innovation. Some authors name the high level of autonomy of local management that is common property in a number of business groups as a barrier to e-commerce. This management could allow itself to be led by going against the possibility of centralising purchasing or other activities.<sup>12</sup>

#### **b) Lost ground in automation and long implementation times**

One of the most significant problems that occur when implementing e-commerce is the long time that is necessary to change procedures within **business management**. Partially for this reason e-commerce leads to long software and communications systems implementation times. This can sometimes be a barrier prior to the decision to embark upon e-commerce. In some companies there is even a backlog in automating internal company processes<sup>13</sup>. Automating these internal business processes must be taken care of before processes between companies using the Internet and e-commerce can be automated: *walk first then run*. Sometimes the long implementation time is a problem that only surfaces after the decision has been taken to embark upon e-commerce.

#### **c) High investment risks**

One of the uncertainties with which the business community is confronted is the increase of investment risks by the high necessary investments in IT (ERP systems) on the one hand, and on the other the longer implementation times of software and systems (it proves that procedures in organisations in the business world do not change quickly enough) in relation to the increasing pace of change. So the implementation of ERP systems is still ongoing in many companies, whilst the new generation of Internet-driven applications has already been on the market for some time. The purchase and implementation of an entire ERP system takes several years and millions in investments, whilst it is now threatened with being superseded.

#### **d) Fragmentation in the software market**

Other impediments are the fragmentation in the **software** market. There are many individual systems for purchasing (procurement), various e-commerce platforms and database systems. There is no software standard. If you wish to exchange standardised shipping documents, you must make bilateral agreements about the composition of the shipping document and the codes for goods and means of transport. The Internet circumvents that problem because you can switch from one screen to the other. Verhoest (1999) states that because of that, questions remain about what the standard will be in the future. Various authors call that a barrier to choosing the standard for an electronic marketplace.

#### **e) Lack of a uniform international legislative framework**

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<sup>12</sup> The Economist, 26 February 2000

<sup>13</sup> Transport en Logistiek (Transport and Logistics), 23 March 2000.



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A number of national laws contain legal uncertainties<sup>14</sup>. There are various national differences in what is legally permitted in marketing, product conditions, levying of excise duty, customs regulations and so on. In addition there are uncertainties concerning legal authorities and liabilities, which makes the adaptation of sites to the various national legislations difficult<sup>15</sup>.

A total overview of the drivers, enablers and barriers is included in table 2.

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<sup>14</sup> OECD, 30 June 2000

<sup>15</sup> Actionplan Electronic Commerce The Hague: Opportunities and impediments of Electronic Commerce, Ministry of Economic Affairs.

Table 4.1: Overview of drivers, enablers and barriers on the basis of studied literature

Drivers	Enablers	Barriers
<p>? <b>Threat of increased competition</b> because of lowered entrance threshold: dynamic traditional rivals and new economy companies</p> <ul style="list-style-type: none"> <li>• <b>Growth due to economic expansion</b> through worldwide electronic market for relatively small investments</li> <li>• <b>Generating extra sales</b> in existing markets</li> <li>• <b>Obtaining durable competitive advantages</b> over "slow" rivals, and also in combination with brand/client relationships making it difficult for aggressive newcomers</li> <li>• <b>Potential for reducing transaction costs</b> by automating a large number of changing ad hoc relationships (source &amp; sell)</li> <li>• <b>Accelerated reduction of number of (stable) relationships and pressure to increase efficiency</b> with remaining strategic suppliers</li> <li>• <b>Potential for reduction of purchase costs</b> of raw materials, materials and products</li> <li>• <b>Potential reduction/elimination of inventory</b> by increasing transparency in supply chains</li> <li>• <b>Potential reduction after sales service costs</b> by automating customer service</li> <li>• <b>Potential for cost reductions and flexibility:</b> in more efficient supply chains and production methods</li> <li>• <b>EDI's inadequacies:</b> inflexible, high implementation costs, closed system of suppliers/buyers whereby end user is closed out of the value chain</li> <li>• <b>Increasing of profit margins</b> by negative operating capital</li> <li>• on-line real-time <b>access of manufacturers to information about individual consumers = mass individualisation:</b> improving customer relations management, faster response time to changes</li> <li>• <b>decline in consumers' A brand consciousness:</b> manufacturers promote A brand products</li> <li>• <b>opportunity for customer relationship:</b> direct on-line connections, open systems with individual clients with Internet as ecosystem</li> <li>• <b>opportunity for one-stop shopping:</b> offering everything through one Internet site</li> <li>• <b>shortcomings of ERP applications</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Liberalisation of national telecommunication markets:</b> falling costs Internet use and electronic transactions</li> <li>• <b>Open structure of Internet and low costs of Internet use</b></li> <li>• <b>Increased simplicity of (ad hoc) outsourcing</b></li> <li>• <b>Sharply reduced PC prices</b></li> <li>• Alliances of traditional companies to new economy companies: <b>access to investment capital and know-how</b></li> <li>• <b>Growth opportunities</b> because of mobile commerce (WAP / UMTS)</li> <li>• <b>Internet opportunities for rationalising production and distribution:</b> connecting and optimising production and distribution locations worldwide using open computer networks with suppliers and buyers</li> <li>• <b>Intelligent powerful search software for saving costs/time:</b> searching for adequate suppliers/partners for ad hoc relationships (commodity markets)</li> <li>• <b>E-commerce as e-enablement for internationalising businesses</b></li> <li>• <b>High quality products</b> that are capable of supporting extra transport costs</li> <li>• <b>"One-to-one marketing" and "mass customisation"</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Internal operations often not in order and not automated:</b> a pre-requisite for e-commerce</li> <li>• <b>Strong resistance in some highly industrial countries</b> to abandon traditional trading practices and long-term industrial relationships</li> <li>• <b>Cultural resistance within companies</b> to communicating in interactive and open environment: "the new business ecosystem"</li> <li>• <b>Lack of uniform legislative framework:</b> legal insecurities in several national legislatures, eg jurisdiction and liability, copyrights, advertising, duties, taxes, customs</li> <li>• <b>Risk for channel conflict:</b> power in the supply chain hinders many initiatives</li> <li>• <b>Tense labour market</b> particularly in the IT and logistics sectors</li> <li>• <b>Procedures in organisations in business cannot be changed quickly enough</b></li> <li>• <b>Increase of transport costs due to fragmentation of transport</b></li> <li>• <b>Support and harmony between front-office and back-office activities</b></li> <li>• Traditional companies: <b>technical know-how and development front-office activities</b> (obtaining/holding onto on-line customers)</li> <li>• <b>Lack of dominant standard in software development</b> to determine electronic marketplace</li> <li>• <b>Exaggerated transport volumes</b> of new economy companies for logistics service providers</li> <li>• <b>Increased investments risks</b> due to increasing IT costs, increased pace of change with relatively long implementation times for software and systems</li> <li>• <b>Fragmentation in the software market:</b> procurement, e-commerce platforms, front-office applications, analytical tools to find databases and supply chain systems databases (for finding critical market information)</li> <li>• <b>Possible delays in adoption of modern supply chain management methods and lean production</b> through on-line auctions</li> <li>• <b>Delays and costs which have occurred</b> in IT because of Y2K, the euro and technical systems integration</li> <li>• <b>Risk of damage to brands and company reputation: web security</b> because of open nature of the Internet to success or failures, to hacking into systems and commercially sensitive information, to finances, etc.</li> </ul>



#### 4.1.4 Drivers, enablers and barriers in three sectors

Drivers, enablers and barriers affect different sectors in different ways. By way of illustration, an overview of the forces that are mentioned in the literature for the automotive sector, the production of PCs and for logistics service provision is provided in the Appendix (the table in the Appendix is restricted to a few main players in the supply chain). These sectors are active in applying and exploiting B2B and the Internet (this is where most market initiatives take place) and include all three of the large transport flows. In addition, a lot has been written about e-commerce or the opportunities for it in these sectors.

Forrester sees great opportunities, in particular for companies with mass products that have a low profit margin, due to the savings possibilities for standard products. According to Forrester, e-commerce is currently growing for electronics and computer companies, air and defence companies and the car industry in particular. This is because of their:

- product suitability: standard products such as electronic components are easy to compare with each other as far as prices and conditions of the various suppliers are concerned; they can be traded frequently.
- the structure of the business sector: e-commerce is particularly suited to business sectors that are highly fragmented or where supply and demand vary greatly.

In the automotive sector, setting up e-marketplaces is a tool that is being used, amongst other things, to strengthen and pool the purchasing power of more than one car manufacturer. The underlying driver is to further reduce transaction costs as well as purchasing costs (source on-line) and to make car purchases directly visible throughout the entire logistics supply chain (potentials for inventory reduction). However, there is growing resistance among the suppliers (barrier) to the car manufacturers' plans. They are even threatening to set up their own e-marketplaces.

PC manufacturers do e-commerce in order to increase their profit margins, by, amongst other things, realising negative operating capital (first selling, then purchasing), direct delivery to clients outside traditional trade and to gain improved insight into current market demand. The preference for the after-sales service of traditional trade leads to resistance to the business market's direct delivery in particular.

#### 4.2 Strategies in Logistics



The term logistics is used in its broad sense. See Chapter 1.

Within the literature, a distinction is made between roughly three different kinds of strategies that are expanded upon as follows:

- 1) a cost reduction strategy, whereby e-commerce is predominantly used to reduce costs directly and/or to introduce savings. That is primarily an internal company strategy.



- 2) a supply chain strategy aimed at outsourcing, whereby e-commerce makes it possible to place parts of the operations outside the company. This strategy can stem from cost considerations, but also from a need for flexibility.
- 3) a supply chain strategy aimed at integration, whereby e-commerce is mainly aimed at the (power) position of a company in the chain of companies. By improving one's position in the chain to the final client, one hopes over time to gain power and commercial profit. This strategy has an external focus, and comes under various guises.

#### 4.2.1 Cost reduction strategy

The literature provides many examples of practical **advantages** that companies can gain from e-commerce. The most important are:

- a reduction of transaction costs, paperwork and time;
- a reduction of purchase costs initially and particularly for facility goods, and also of product sales costs.
- an improvement of the flexibility, efficiency and responsiveness of the logistics supply chain to changes within the market. Operations can be tuned to each other more quickly. Anderson Consulting argues that 55 to 60 percent of companies wished to make savings in this manner (2000, p.26).

#### Size of the cost reductions

The size of the potential cost reductions gives widely differing pictures for different sectors (see table below).

**Table 4.2**  
Potential cost savings per industry sector in the US due to e-commerce

Industrial sector	Potential cost savings *
Aerospace machinings	11 %
Chemicals	10 %
Coal	2 %
Communications/Bandwidth	5-15 %
Computing	11-20 %
Electronic components	29-39 %
Food ingredients	3-5 %
Forest products	15-25 %
Freight transport	15-20 %
Healthcare	5 %
Life science	12-19 %
Machining (metals)	22 %
Media and advertising	10-15 %
Maintenance, repair and operating services	10 %
Oil and gas	5-15 %
Paper	10 %
Steel	11 %

Source: Goldman Sachs (2000).

\* estimated as a percentage of the total costs

Table 4.2 indicates that the maximum savings are estimated differently per sector. It is **not clear** how these estimates are come by. In a number of cases the savings that have been made to date from limited experiments are transposed to a situation with 100 percent e-commerce.

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### **The place of cost reductions in business operations**

Aside from differences in the size of potential cost reductions, there is also a difference when looking at sales/marketing on the one hand and purchasing/inventory on the other.

According to Anderson Consulting, sales and marketing are the most important business tasks where is applied. E-commerce is used for these tasks by 72 percent of the companies in one way or another.

Purchase sites are used, amongst other things, to achieve improved stock control. Improvement of internal operations is an important argument to start doing e-commerce.

According to Cohn, e-commerce enables purchase costs to be reduced by 15 to 20 percent.<sup>16</sup> In the retail trade savings on transaction costs are estimated to lie between three and five percent. Ahold considers these estimates to be on the high side.

From the practical examples given in the literature it becomes clear that savings on purchase costs are not achieved with raw materials or unfinished products, but with facility products and services such as stationery, cleaning products and so on. For example, Unilever considers its most important B2B strategy to be joint procurement. The purchase of raw materials and unfinished products are not really what is important, as sufficient scale size has already been achieved here. What is particularly relevant is the purchase of supporting products:<sup>17</sup> based on B2B, economies of scale can be achieved by the joint purchase of packaging material, boxes, copying equipment and so on<sup>18</sup>.

This example indicates that it is not responsible to place equal value on cost savings achieved on secondary products as on main products.

When a group of companies makes joint purchases, as is the case in the chemical industry, car industry, retail sector and so on, their position towards suppliers improves. That implies that the position of that supplier becomes relatively weaker, and that he shall probably have to accept a lower sales price (possibly even lower than the supplier's savings on the transaction costs).

### **Risks connected to cost reductions**

In the literature a number of risks are mentioned for achieving the mentioned savings<sup>19</sup>:

- the extra investment costs in personnel and materials that are necessary for e-commerce;
- if clients and suppliers do not participate, parallel systems are necessary and that increases costs;
- implementation always involves mistakes and those can rise significantly;
- waiting and learning from the mistakes of others seems to be cheaper, but would you miss the boat then?
- often it is not known which parts of companies may or may not be suited to a virtual medium;

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<sup>16</sup> Cohn, 2000

<sup>17</sup> Here it concerns 1) so-called MRO items: maintenance, repair and operations and 2) indirect materials: products that are not directly necessary for one's own production such as office requirements: PCs, disposables and so on. European Logistics Management (29-02-2000): Reticence over sell-side E-commerce will go.

<sup>18</sup> Nieuwsblad Transport (Transport Newsletter), 6 October 2000

<sup>19</sup> Supply Chain Management, No. 1 2000



- 
- it is not known whether e-commerce will lead to a sustained competitive advantage.

Andersen Consulting indicates that a third of the companies report some form of success. Not more than half of these companies expect to gain an advantage in the competition struggle. A year previously two thirds expected to be able to achieve that <sup>20</sup>.

#### **Benefits of cost reductions**

Goldman Sachs considers that a growth of five percent of the US GNP is possible in the long term thanks to savings through e-commerce.

On a national level the OECD thinks that a price reduction of four percent is possible due to cost savings and/or greater choice. <sup>21</sup> It is argued that many assumptions were made in making these calculations and that their predictive value is limited. For Europe, larger cost reductions than in the US are deemed possible because the traditional European markets are less competitive than the American ones.

**On balance** the figures on cost savings provide a great deal of uncertainty. For example, there is a lack of information about who actually receives these savings, and what the cost effects are on other partners.

#### **4.2.2 Supply chain strategy aimed at outsourcing**

##### **Outsourcing operations**

Various authors argue that e-commerce makes it easier for businesses to outsource different activities in order to achieve a deliberate mix of fast, ad hoc relationships as well as intensive ones with suppliers, distributors and so on. The horizontal marketplaces ought to be able to facilitate this. They offer access to specialists in taking over specific links in the supply chain. For example, this could be access to logistics service providers, or to manufacturers of a unique, global product.

The tendency to outsource has been evident for some time. It is particularly evident in capital intensive production, for example in Philips, Sara Lee, car manufacturing, electronics, and so on. It is expected that electronics and car manufacturers will focus more on R&D and marketing their products and services.

A number of authors argue that when companies wish to increase their control over the logistics supply chain, e-commerce is a simple alternative for taking over or starting up durable partnerships and long-term contracts<sup>22</sup>.

Information could travel up and down the supply chain without delays, enabling a joint, fast response to changes in the market and room to be made for joint and complex inter-organisational innovations. It is argued that outsourcing back-office activities can be more widely and relatively more simply introduced due to the Internet.

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<sup>20</sup> 2000, p.26/27

<sup>21</sup> OECD, 2000

<sup>22</sup> International Journal of Physical Distribution & Logistics Management, No. 3/4 2000



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### Outsourcing logistics

Horizontal marketplaces, such as *on-line B2B freight exchanges*, are primarily aimed at one business operation. These offer *web-based business tools* for logistics and transport. Examples are *eLogistics*, *Freight Traders* or *Translogistica*. On sites like these, shippers can ask for transport. Logistics service providers can then place on-line bids. Shippers can be in on-line contact with more than one logistics service provider at once. Logistics service providers can adjust their bid until the shipper makes a firm choice.

The Economist argues that, when the transparency of these sites improves, the following advantages are realised:

- reduced inventory levels for shippers;
- higher average load rates for the transports;
- fewer empty return trips;
- better use of the vehicle;
- higher earnings on invested capital;
- better communication with clients;
- simpler administration through, for example, electronic proof of delivery;
- lower administration and transaction costs.

Logistics service providers often work for specific companies with long-term contracts. Many authors conclude that because the market is becoming more transparent and the e-commerce platforms offer more opportunities for concentration these relationships will in time become less permanent<sup>23</sup>. No empirical evidence has been found to prove this.

#### 4.2.2 Supply chain strategy aimed at integration

Roughly three different network strategies can be distinguished:

##### a. Co-ordination strategies across the supply-chain

In order to optimise the total supply chain, so-called vertical marketplaces are often used. They are used for both upstream and downstream transactions: *source on-line* and *sell on-line*. The aim of the main utilisers is that the supply chain is co-ordinated more rigorously. On balance, it will lead to a strengthening of client relationships<sup>24</sup>.

Through this kind of market place, buyers can, for example, be connected to the *intersite* with *easy-order-entry* applications from the manufacturer. As a result, the manufacturer gains on-line insight into changes in market demand and can adapt his activities accordingly.

In reverse, suppliers can gain on-line access to the manufacturer's stock systems in order to custom stock them (ASPA methodology)<sup>25</sup>.

The idea is that when manufacturers, direct suppliers (*1<sup>st</sup> tier suppliers*), indirect suppliers (*2<sup>nd</sup> tier suppliers*) and buyers participate in one and the same electronic marketplace, supply and demand can be tuned more precisely to each other. As a result, partners can reduce their inventory. Inventory, production and purchasing can be tailored more precisely to demand. For example, when the car hire company Hertz orders, say, ten red and ten blue

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<sup>23</sup> European logistics management, 29 February 2000

<sup>24</sup> International Journal of Physical Distribution & Logistics Management, No. 3/4 2000

<sup>25</sup> Transport en Logistiek, 06 March 2000

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convertibles from Ford, the relevant information not only goes to Ford, but also directly to the tyre manufacturer, the glass manufacturer, steel mills, paint manufacturers and so on, in order to ensure that they all deliver the correct number of components to fill the order. These marketplaces seem to be particularly successful for car manufacturers because, as deeply concentrated partners, they each take unfinished goods from a large number of fragmented suppliers. Upon reading the literature it becomes clear that car manufacturers can make significant savings by using these kinds of marketplaces. It is not clear the extent to which suppliers stand to win or lose in this situation.

On-line information exchange between all partners in the supply chain offers in principle opportunities to develop the interaction further and to re-configure the supply chain. For example, order-receiving systems can be linked to financial, manufacturing, inventory and logistics systems, across multiple companies. The result is a faster production process, certainly at the supply chain level. It also offers opportunities for, for example, virtual, multi-functional, cross company teams working on operational innovation in the supply chain. According to the nature of the relationships, the balance between independence and dependency of each of the partners can be more precisely regulated.

Some authors argue that e-commerce delays the adoption of modern supply chain management methods as well as lean production because it leads to cost savings for a few individual partners in the supply chain, but not to optimisation as far as the entire supply chain is concerned. They argue that it is difficult for top managers to avoid the temptation of fast results. They conclude that the jointly created marketplaces from giants such as Ford, GM, Daimler Chrysler or Toyota ultimately increase their monopoly position with regards to suppliers.<sup>26</sup>

Many of the top 100 largest companies worldwide make use of a B2B on-line auction, for example, AlliedSignal, Caterpillar, Emerson Electric, Frigidaire, General Motors, Owens-Corning, PepsiCo, Procter & Gamble, Quaker Oats, United Technologies Corporation, Westinghouse and Whirlpool<sup>27</sup>.

#### **b. Strategies for by passing partners in the supply chain**

Various authors argue that the market transparency increases as a result of Internet and e-commerce applications, and that in principle it is therefore technically possible for all manufacturers to bypass traditional intermediaries such as importers, wholesalers, carriers, dealers and retailers. That would not only increase profits, but also directly provide essential market information. A number of manufacturers work in this way, for example in the car and PC industries.

Some authors<sup>28</sup> regard this as the starting signal to completely cut out intermediaries. Instead, companies would deliver directly to consumers everywhere.<sup>29</sup> On the other hand, others see a new role for existing intermediaries or completely new intermediaries. See for example the *re-intermediation* in figure 4.1.

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<sup>26</sup> See for example The Economist, 17 June 2000

<sup>27</sup> Supply Chain Management, No. 4 2000

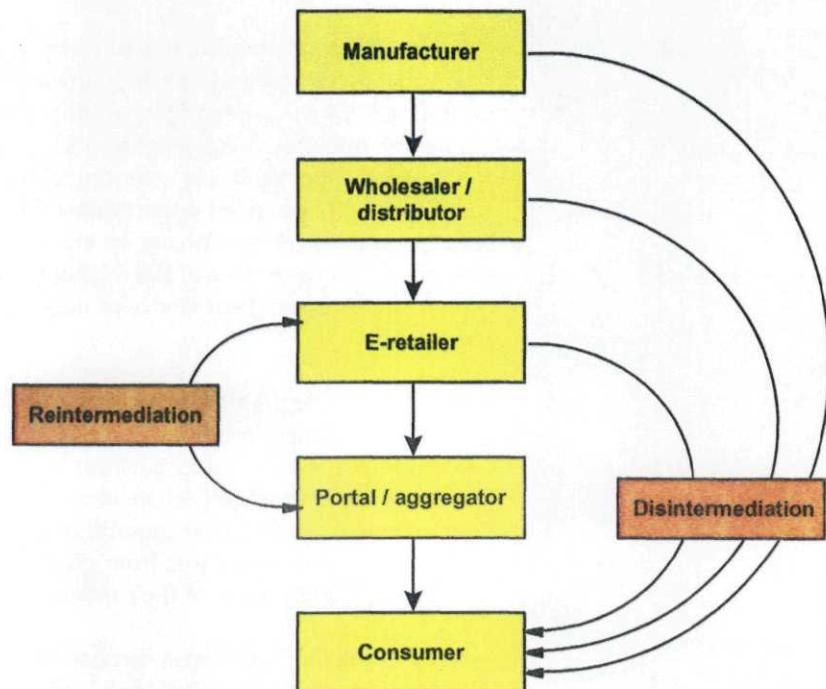
<sup>28</sup> Supply Chain Management, No. 5 1999

<sup>29</sup> Automatiseringsgids (Automation guide), 18 February 2000



Cap Gemini Ernst & Young argue that end users can choose suppliers directly thanks to e-commerce, and can place orders with manufacturers in the same breath. According to them the function of the wholesaler can be taken over by virtual companies that outsource all physical activities and focus solely on marketing and sales. According to them, 25% of all wholesalers in The Netherlands used e-commerce in the year 2000.<sup>30</sup>

Figure 4.1  
Rebuilding the value chain



Source: Benchmark Capital - The Economist.

Authors who predict that intermediaries will disappear presume that they make commerce less efficient. As argued by the OECD, the role and influence of intermediaries is, however, complicated. They often act as lubricants. In addition, they are not remaining idle. Their role is not only attached to information, but also to the consolidation of goods flows. E-commerce offers them opportunities for new forms of adding value, such as e-retail and portals where products can be offered (see figure 4.1).

#### c. Strategies attached to changing relationships in the supply chain

Forrester for instance argues that the costs of changing partners have tumbled drastically and that information and practical examples are becoming available to others. According to Forrester that will lead existing supply chain relationships to be broken open.<sup>31</sup> Achievements could be easily measured and monitored. That would bring outsourcing a step closer, of central functions

<sup>30</sup> Cap Gemini Ernst & Young, 26 October 2000

<sup>31</sup> Forrester Research, February 2000



such as human resources and bookkeeping as well. Technically, financial and technical integration between companies and service providers is possible. A number of companies are opting for this approach. For example, the Swedish telecom company Ericsson outsources its production to contract manufacturers. Fujitsu Siemens Computers recently sold one of its German factories to Flextronics that now functions as a contract manufacturer.<sup>32</sup> The Internet and e-commerce facilitate this kind of business strategy.

According to *The Economist* this means that relationships with suppliers that have been nurtured for a long time and have had long-term success in Japan and Germany, can fall apart: "e-commerce has thrown the delivery market open for suppliers of all sizes, locations and backgrounds"<sup>33</sup>. Cultures such as the *keiretsu* in Japan, whereby suppliers depend upon the manufacturer with whom they have an exclusive long-term relationship, "could give way to the sort of flat, open and competitive web-based parts market that America's car makers are setting up".<sup>34</sup>

The literature lacks an analysis of the conditions that must be complied with in order to be able to break off the "old" relationships and to replace them with the "new". Such an analysis is essential for making reliable predictions.

Examples are often given of car manufacturers such as Nissan and Toyota, who wanted to review their relationships with suppliers, and reference is also made to consumer electronics. For instance, the giant Matsushita has stated that it is going to let its contacts with suppliers take place over the Internet in the future. At present, Matsushita uses expensive, closed EDI networks for its purchasing to which only large suppliers are connected because of the high investment costs necessary. In theory, an Internet system enables all potential suppliers to bid for contracts, regardless of their size. Matsushita considers that the possibilities for a tighter planning of the supply chain offer big advantages, leading them to be able to respond better to changes in demand and the potential to reduce inventories.

Some authors deduce from these examples that the trend is moving towards this far-reaching outsourcing. In order to remain competitive, outsourcing production should be a requirement<sup>35</sup>.

However, it is questionable whether the technical possibility that is made easier by e-commerce is a reason for other companies to follow this path.

#### 4.3 Logistics Structures



What changes in logistics structures are brought about by e-commerce?

Real-time insight into market developments, greater transparency in the supply chain and possibilities of responding more quickly to changes in the market lead

<sup>32</sup> *The Economist*, 12 February 2000

<sup>33</sup> OECD

<sup>34</sup> *The Economist*, 15 April 2000)

<sup>35</sup> *The Economist*, 14 February 2000

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to different strategies and offer manufacturers the opportunity to look for economies of scale by further spatial concentration of production and distribution. In principle this could lead, on average, to larger transport distances to the sales markets. Is that happening? A general, empirical basis for this argument, other than a few individual cases, has not been found.

#### **From strategy to structure**

When, for instance, we are concerned with the strategy to eliminate traditional intermediaries, it is worthwhile knowing what the authors mentioned think might replace this intermediary or distributive trade. It is argued that it would offer opportunities for logistics service providers: for *third party logistics service providers*, *3PLs* or even *4PLs*. The wholesale trade fulfils a trade function as well as a physical consolidation function of goods flows. The trade function forms a potential cost saving for manufacturers and the consolidation function offers potential for logistics service providers.

The car industry is often mentioned as an example of the strategy to eliminate the intermediary trade. In the near future a car buyer will be able to go for three years or 100,000 without having the car serviced. At present this happens more frequently, ie every 50,000 km or 2 years. In doing this the car industry is going along with the consumer's wishes, but also hopes that by doing this he will be able to build up more direct contact with consumers away from dealers. To achieve this aim setting up large, regional, service centres is being considered.

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The question is whether all car manufacturers wish to bypass the dealers. For instance, Ford spends more than 300 million dollars on its Internet infrastructure to support a number of web-based applications that are intended to make buying a car over the Internet more personal. At the same time, Ford's car parts division Visteon offers speed and reliability to small dealers *as well* who order parts over the Internet. This provides dealers with a better service and enables Visteon to collect much more effective market information in order to expand into new markets.

For car manufacturers, the client-focussed e-commerce follows on from the e-commerce with suppliers and it offers advantages for optimising the production process, reducing inventory, etc. It is not yet clear how consumers and dealers will react.

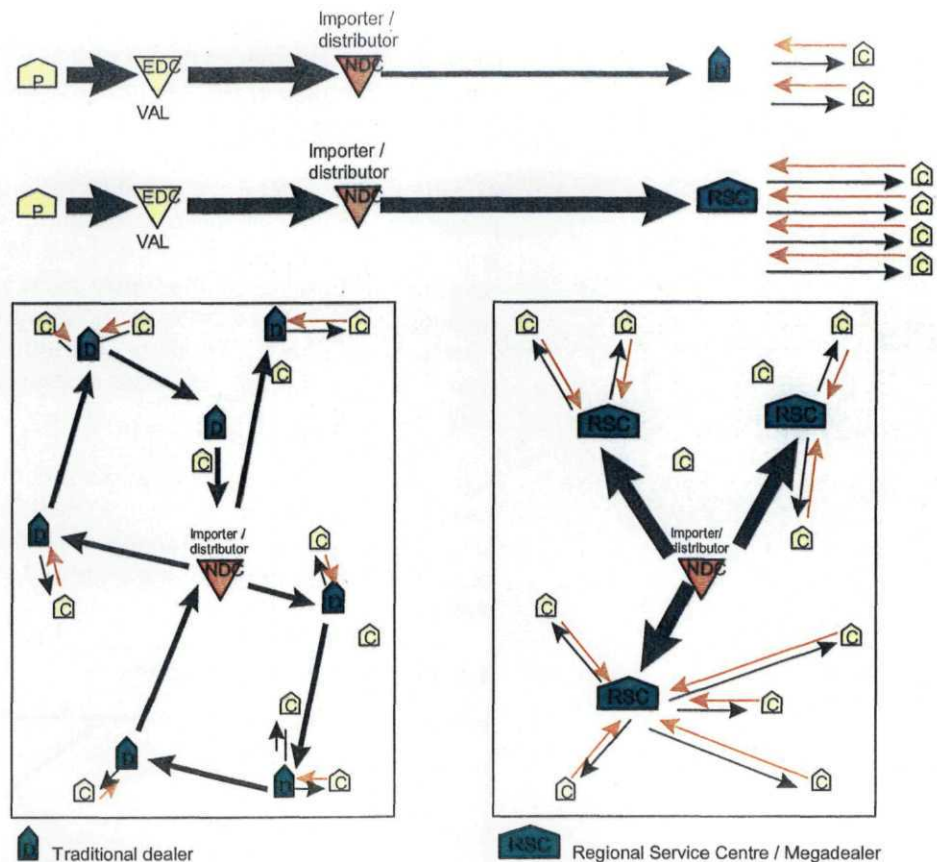
Production and distribution are highly centralised in the current car industry. In European distribution centres (EDC) value added activities are often carried out. Car distribution from the EDC often goes via the national importers. In figure 4.2 those are the National Distribution Centres. From the NDCs the final distribution to the dealers ("D") takes place, which is where the sale to the consumer ("C") happens.

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<sup>36</sup> Auto & Motor Techniek (Car and Motor Engineering), April 2000



Figure 4.2  
Old and new hypothetically possible car  
distribution structures



The newly devised model means that the car manufacturer can allow heavier goods flows to and from the megadealers with cars and parts. In addition he is capable of making faster deliveries, and can also take the margins of the intermediary trade, thereby increasing his own profit margins.

Whether this development will continue is partially dependent on the question whether many consumers can be persuaded to buy on-line, and also on the dealers' reactions. Buying and selling cars is more than merely providing information.

Another sector often mentioned as an example of a place where the intermediary trade is eliminated is the PC sector.

Dell is the standard example. It sells computers purely by telephone and over the Internet directly to customers instead of by means of traditional trade. It assembles them in factories throughout the world and from there it distributes directly to customers. Dell gives its suppliers direct, real-time insight into its customer sales through its e-commerce site. This enables suppliers to accurately tailor their production and delivery to Dell's final assembly. They also have immediate access to information about changes in market demand. Customers also have on-line access to the order status and can track the progress of the order. In Europe Dell delivers 7 days after orders are placed. On average, enough inventory for 10 days is maintained - on average PC manufacturers maintain stock for 70 days<sup>37</sup>.

Nonetheless, various larger buyers have forced Dell to deliver through the existing intermediary trade as well.

<sup>37</sup> International Journal of Physical Distribution & Logistics Management, No. 5 2000

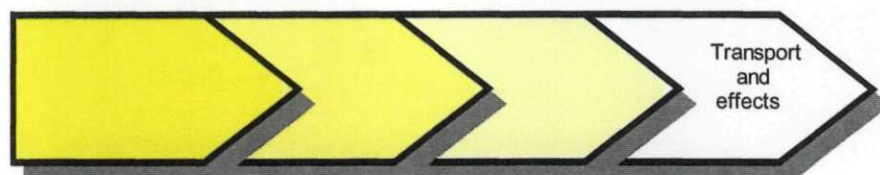


Unilever is another example. Unilever only considers direct delivery to the consumer for a few market niches such as perfumery. E-commerce does not alter the distribution of average products because conflicts with retailers in particular are not desired.

Aside from the strategy of eliminating the intermediary trade, the previous paragraph also mentioned a co-ordination strategy; due to increased transparency of the supply chain and real-time insight into changes in market demand for all partners in the supply chain, inventories can be reduced (network/co-ordination strategy). In the warehouses emphasis is placed on *cross-docking*: allowing incoming goods to leave immediately without being stored. As a result, much less space is occupied. E-commerce strengthens this trend.<sup>38</sup>

Signs of real changes in the logistics structures have only been found in a small number of individual cases. There is relatively little quantitative insight into real-life cases of actual structural changes in supply chain. In the literature a number of hypothetical expectations are expressed about possible changes in logistics structures.

#### 4.4 Possible effects on transport



The literature contains a number of hypotheses about possible effects on transport. These mesh with the identified strategies, but their foundations ought to be further researched based on practical research.

Some authors expect **cost strategies** to lead to various forms of consolidation via a progressive, managed complement of European, national and regional transfer centres. They assume that it will lead to the consolidation of goods flows across supply chains: *the extended value chain*, ie logistics and transport integrated across individual supply chains<sup>39</sup>.

Cost strategy also plays its part in optimising the use of the available freight capacity. This is possible because e-commerce offers many opportunities for *freight exchanges*. Logistics virtual networks could be put together flexibly in order to optimise the use of the available freight capacity, to reduce driving with empty vehicles and so on, thanks to the automated matching many people offering and supplying.

According to Dialogic, outsourcing (**outsourcing strategy**) could lead to a temporary network of independent companies where there is a lack of a hierarchy and that is based on transparent, flexible and dynamic relationships in a number of cases. It could offer opportunities for far-reaching efficiency improvements with large logistics service providers.

By way of contrast, the physical complexity of supply chains will increase. In addition, logistics chains can become longer due to the search for economies of scale and scope

<sup>38</sup> Inkoop en Logistiek (Buying and logistics), March 2000

<sup>39</sup> Dialogic, November 2000

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Under the terms of the afore-mentioned **supply chain co-ordination strategy**, e-commerce highly increases the possibility of assembling to order instead of for the inventory.

All partners in the chain are able to respond quickly due to on-line and real-time insight into changes in market demand. Inventories can thus be reduced. Some authors think that this could ultimately lead to an increase in transport despatches that are smaller in size, which in turn could lead to transport fragmentation. They do not examine whether any new initiatives could emerge in the market that may combine this kind of fragmented transport.

Some authors argue that the need for fast responses and transport considerably reduces the opportunities for rail transport and inland shipping. They do not examine how far that relates to the fact that transport can be planned better due to improved transparency.

A number of authors consider that the **strategy for bypassing parties/suppliers in the chain** is expressed by the phenomenon that more companies will deliver directly, outside the wholesale or retail trades. The contracted logistics service provider could eventually take over the wholesaler's consolidation function. Direct sales to the consumer will bring about a shift between the size of **goods transport** and the size of **people transport**. When delivery to consumers takes place via high-density sales points, ie megadealers and factory sales, efficiency improvements in goods transport are to be expected. In the literature it is usually assumed that when a choice is made for home deliveries, the goods flow will become fragmented, resulting in an increase of the number of vehicle journeys rather than the volume of the transport of goods. As a result, environmentally friendly transport by consumers to and from the sales points on foot and by bicycle is replaced with goods transportation.

No direct indications of actual changes of transport flows as a result of e-commerce have been found in the literature.

The only estimates in figures of the impact of both B2B and B2C on goods transportation is those we have from TLN (New wine in old bags, 2000). TLN has calculated that the extra transport that is generated by e-commerce will be 3.5 million tons in 2005. TLN assumes that all of these loads will be transported with smaller lorries and delivery vans. This could result in a nine percent increase in journeys in 2005 due to B2B, plus an extra eight percent increase in journeys due to B2C, resulting in a total increase of seventeen percent. It was not assumed that transporters will be able to do much in the way of improving efficiency for this kind of transport.

#### 4.5 Conclusions for B2B

1. E-commerce is an unmistakable trend among companies. There are many examples of large-scale manufacturing companies in particular who initiate B2B electronic marketplaces for on-line purchases (source on-line). We know that for a small number of companies on-line purchases do indeed take place.
2. The Internet is the most important enabler for B2B.
3. A number of companies view e-commerce as a *qualifier*.
4. *Not missing the boat* is the most prevalent reason.
5. In the future, the European experience of dealing with different business cultures will prove to be advantageous in relation to American companies. The latter currently dominate e-commerce.



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6. The most significant barriers are: resistance in traditional company cultures, lagging behind in automating internal business processes, long implementation time, high investment risks, the fragmentation in the software market (lack of software standards) and the lack of a uniform international legislation.
  7. For a number of companies being able to reduce costs is a decisive argument for taking steps towards e-commerce.
  8. For other companies reducing costs is an incidental advantage. For them, being able to improve client relationships and being able to acquire client information thanks to e-commerce is a *strategic* goal, in order to be able to speed up the processes in the logistics chain and to be able to co-ordinate them with each other.
  9. E-commerce seems to lead to more stable relationships between companies. Theoretically speaking, it is possible that e-commerce could relax relationships between companies, but that would bring too many uncertainties for many companies. In addition there is no empirical evidence for a general trend in that direction.
  10. There is a gap between the vision of new economy companies and consultants about the potential of e-commerce, and actual current practice of companies as they automate their business processes. Not many companies have brought order into their internal processes and/or automated them sufficiently, and therefore they are not capable of entering into external automated relationships and supporting business processes. In theory, the use of e-commerce offers many possibilities, but in practice many contrary forces exist.
  11. Few real-life cases of actual changes in the logistics structure of supply chains have been observed. Only a small number of individual cases show signs of actual changes. These changes appear to be experimental in nature.
  12. The literature does not provide any direct evidence of changes in transport flows as a result of E-commerce. Using the theoretical model as a starting point, theoretically possible changes in transport for a restricted number of cases has been given based on changes in the logistics structure.
  13. A lot has been written about the forces pushing businesses towards e-commerce; a lot of this is qualitative and based on limited observations. There are various case descriptions, largely American success stories. There is only a limited amount of representative, empirical material.

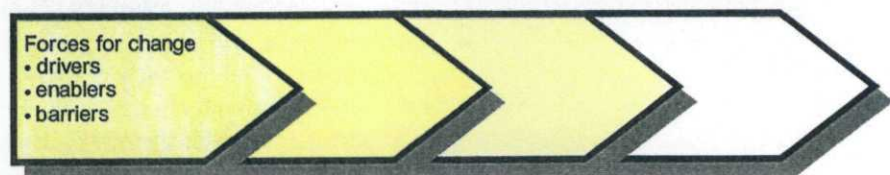


## 5 Business to Consumers (B2C)

### 5.1 Introduction

The application of e-commerce in the Business to Consumer (B2C) segment covers a limited number of sectors. Based on an analysis of the literature and an analysis of the market, there are four dominant sectors: food products, consumer electronics, books and music/CDs. Books and CDs are at the absolute top of the sales figures.

### 5.2 Forces for change



#### 5.2.1 Drivers

There are different arguments for and against e-commerce for market partners. This also is true for consumers. An understanding of the consumer's requirements and desires is essential to be able to sell over the Internet in the B2C segment. Consumers have different reasons for whether or not they buy products over the Internet: <sup>40</sup>

Table 5.1

Advantages and disadvantages for the consumer when purchasing products over the Internet

Advantages	Disadvantages
<b>Ease</b> - consumer does not have to leave home, can order at any given time and does not depend on store opening hours. <b>Advice</b> - good advice is possible based on purchasing history <b>Information</b> - extensive product information, also from fellow users <b>Choice</b> - large search possibilities for products in the market; easy to track down rare products <b>Price</b> - transparency with regard to market sales prices	<b>Payment</b> - often gives problems (privacy, faith in its security) <b>Price</b> - (standard) products are often more expensive <b>Distribution</b> - distribution and completion of orders is often problematic <b>Service</b> - complaints department is badly organised <b>Reliability</b> - reliability of sales person/store difficult to determine <b>Quality</b> - consumer cannot touch or smell the product

Socially, there are various arguments for consumers to examine the possibility of buying products over the Internet. Examples are a lack of time to do the grocery shopping, or a reluctance to having to go out to do standard grocery shopping.

It is impossible to indicate all internal drivers within an organisation. They are not uniform due to, amongst other things, differences in type of business,

<sup>40</sup> Intermediair en Dialogic (Intermediary and Dialogic), 2000

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management approach, kind of manufacturing process and the product - market combination that an organisation focuses on.

In addition, the drivers mentioned can be conflict within an organisation. The development of a front office (website) often happens under the initiative of the sales and marketing department. Subsequently, problems emerge in organising the back office: the logistics (distribution) processing. There are examples of companies from *the new economy* where a logistics and distribution department is entirely lacking.

Reasons for doing e-commerce or not, vary greatly per party:

- Direct market access is an argument for **newcomers** to commence with e-commerce. The *click&bricks* start with an Internet application and link distribution to it. Distribution often causes them problems. Cost advantages and being able to use their client base are reasons for **mail-order companies** to start doing e-commerce. It is a logical next step for them. They have a lot of expertise in individual delivery to consumers.
- **Retailers** hold a dominant position in the traditional market so for them direct access to the market is not a reason. E-commerce is for them more of a dis-investment with regards to their existing shop network. The threat that third parties may enter the market is their most important driver. Unfamiliarity with delivering to individual consumers is a handicap for them.
- For **large manufacturers** and **wholesalers**, potential access to the market is a persuasive argument for doing to e-commerce. Strong branding makes it attractive, but some companies realise that, by contrast, it is impossible to try to equal the efficiency that retailers have already achieved. In addition, they cannot offer the consumer a complete range and they lack knowledge about distribution to individual consumers.
- There are varying arguments for **consumers** to take up the offer of e-commerce. For some this could be the ability to find a rare product, for others it could be the possibility of choosing from a gigantic supply, for yet others it could be the opportunity to shop at unconventional times. In some cases price plays a part, in others this is in fact a barrier. Payment and distribution problems are often arguments against e-commerce. Anyway, the high degree of penetration of the PC and the Internet makes e-commerce possible.

### 5.2.2 Enablers

It is true for both for manufacturers and retailers that a strong brand and/or a good image are big advantages when directly approaching consumers over the Internet. This is often an advantage that organisations from the *old economy* have over organisations from the *new economy*.

In contrast to most manufacturers and wholesalers, retailers have experience of and are knowledgeable about direct sales and distribution to end consumers. Market partners who have client information (POS data) use it to optimise sales to end consumers and it is partially responsible for their largely dominant position in the chain. When using e-commerce, market partners who have insight into consumer's purchasing habits are initially at an advantage. Ultimately, all organisations that sell to consumers over the Internet will possess client information.



The liberalisation and capacity of the telecom infrastructure, low technology costs, large degree of (standard) access and the fast development of technology are the most important technological enablers of e-commerce for all sectors.

In addition, mobile communications in particular is mentioned as a great enabler of e-commerce. With a mobile telephone, buying products and services is within reach at any time and place, particularly through the combination of GSM, GPRS, UMTS with location-enabled applications or smartcards. This m-commerce could be an important development in a consumer's experience. Whether transport will increase or change as a result is not known given the transient nature of this activity.

**Table 5.2**  
Examples of Enablers to using e-commerce

Food products	Consumer electronics	Books	Music/CDs
<b>Manufacturer</b> Strong brand Image	<b>Manufacturer</b> Strong brand High quality product Built to order possibility Assemble to order possibility	<b>Manufacturer</b> Brand (publishers) Unique, own product (copyright)	<b>Producer/artist</b> Image Unique, own product (copyright)
<b>Retailer</b> A lot of knowledge and experience of selling to individual consumer Strong power position in chain	<b>Retailer</b> A lot of knowledge about selling to individual consumer Strong power position in chain	<b>Retailer</b> A lot of knowledge about selling to individual consumer Strong power position in chain	<b>Retailer</b> Knowledge of selling to individual consumer  Relatively strong power position in chain
<b>General</b> Liberalisation and capacity of telecommunication infrastructure Sufficient degree of automation (internal)  A lot of available capital Fast development of Internet technology (WAP, UMTS) High degree of penetration of PC with consumers Low costs of technology, large- scale access	<b>General</b> High quality product Many luxury and standard products Many modular products (postponed manufacturing) Homogenous (European) demand side of market Liberalisation and capacity of telecommunication infrastructure A lot of available capital Fast development of Internet technology (WAP, UMTS) High degree of penetration of PC with consumers	<b>General</b> Relatively high quality product Many luxury and standard products Strong brand name Homogenous (European) demand side of market Liberalisation and capacity of telecommunication infra A lot of available capital Fast development of Internet technology (WAP, UMTS) High degree of penetration of PC with consumers	<b>General</b> Many luxury and standard products Strong brand name Homogenous (European) demand side of market Liberalisation and capacity of telecommunication infra A lot of available capital Fast development of Internet technology (WAP, UMTS) High degree of penetration of PC with consumers



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### 5.2.3 Barriers

In the literature it is assumed that in sectors where retailers play a dominant part, **manufacturers** have few opportunities for e-commerce that is aimed at consumers. The largest cause is reported to be the fact that manufacturers cannot and do not wish to antagonise traditional retail<sup>41</sup>. Because Ahold, Laurus and Superunie for example make joint purchases for more than 90% of the total food products market in The Netherlands, most (A brand) manufacturers in the food products sector are largely dependent on these three retailers, who have very strong purchasing power, for their revenues.<sup>42</sup>

Aside from power relationships in the supply chain, another barrier preventing manufacturers from approaching consumers directly is the fact that they are supposed to conduct activities that differ greatly from the traditional core business. Aside from production and possibly marketing of end products, a manufacturer would also have to shape (the organisation of) the final distribution to the client, and that is a different principle from distributing to stores.

Aside from this most individual manufacturers are unable to offer a full range. The initiative of the Westelijke Land- en Tuinbouw Organisatie (WLTO), an agricultural organisation in the west of The Netherlands illustrates this point; they try to approach the consumer outside of the retail channel. The reasons for this are the relatively low margins of the products for the growers and the strong purchasing power of retailers. However, it has proven to be impossible to find a retailer who is prepared to deliver the range of complementary dry grocers goods to the WLTO's e-commerce initiative; the retailer would then of course be competing with his own range in the supermarket.

Based on the directive role they play logistically and commercially, **retailers** are able to strongly influence a manufacturer's revenues. This can happen for example by:

- the assembly of the ultimate range in the shop,
- the allocation of product placement on shelves,
- special offers and promotions with competing products and
- determining sales margins.

This kind of (re)action by a retailer to a manufacturer's e-commerce initiatives is plausible because the retailer has few financial drivers inducing him to sell to consumers over the Internet on a large scale. For example, retailers' current infrastructure is not suited to the sale and distribution of goods to individual consumers. Nonetheless, direct sales to consumers can offer advantages such as increasing the market area, increasing total revenues, reducing transaction costs and increasing the added value in the supply chain.

In a report by Lehman (2000) the expectation is expressed that, in the future, traditional retailers from the *old economy* will have the highest share of sales via the Internet, ie those retail organisations that have a mix of physical and virtual means and knowledge of and experience with sales and distribution to consumers. Traditional retailers, who to date have remained on the sidelines, largely owe their lead to the fact that in the near future it is highly likely that there will be logistics service providers who will be able to offer an adequate

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<sup>41</sup> Baron, 1998

<sup>42</sup> AC Nielsen, 1999

services package tuned to wishes from the B2C segment. For instance, it will probably be possible to outsource warehousing, order management and distribution more effectively than is currently the case.

Low value products (food products) have the greatest need for relatively low distribution costs. These products only have a right to existence in traditional stores based on their high turnover rate. The extra handling and transport costs that are expected with the logistics processing in the B2C segment will be able to be *carried* better by products with a greater value.

Barriers vary per sector. For example, with food products and electronics the consumer attaches in general great importance to being able see, feel and touch the product. This is less the case for books and CDs. In table 5.3 we give a few examples of barriers.

The conclusion is all market partners have reasons to offer products over the Internet or not. Aside from the market structure and accompanying power relationships there are other factors that prevent some players from using e-commerce. The obstacles that are often mentioned in the literature are:

- the traditional logistical organisation is not geared towards individual deliveries;
- lack of knowledge about selling and delivering to individual consumers;
- gigantic historical investments in logistics infrastructure (shops, parking and DCs);
- the lack of an appropriate logistics service provider;
- limited level of (internal) automation;
- restrictions due to the kind of product (seeing, feeling, smelling and value);
- uncertainties about the security of payments and the consumer's privacy;
- bottlenecks with consolidation across chains (timeframes).

**Table 5.3**  
Examples of **barriers** when embarking upon e-commerce

Food products	Consumer electronics	Books	Music / CDs
<b>Manufacturer</b> Sale and distribution are not core activities Inability to offer full range Dependency on retail (>80% revenues) Low margins and high distribution costs Lack of knowledge about (delivery and distribution) to individual clients Logistics organisation is	<b>Manufacturer</b> Large power of retail sector Lack of knowledge about (delivery and distribution) individual clients Logistics system not geared towards individual delivery Relatively high distribution costs Sales and distribution are not core activities <b>Retailer</b> Historical investments in	<b>Manufacturer</b> Large power of retailers Lack of knowledge about individual clients Limited organisation of back office (traditional logistics system) <b>Retailer</b> No added value to chain with digital distribution Reduction of economies of scale in traditional sales channel	<b>Manufacturer/artist</b> High power of intermediaries Lack of knowledge about individual clients Lack of knowledge and experience logistics and fulfilment Necessity of setting up specific back office <b>Record companies</b> Power position of retail sector Knowledge about selling to consumers



not geared towards individual delivery Traditional retail channel extremely efficient	logistics infrastructure (shops, parking and DCs) Difficulty in integrating B2C with traditional logistics Possible reduction of economies of scale in traditional sales channel (substitution to on-line) High distribution costs	(substitution to on-line) Additional knowledge needed for on-line distribution (copyright and so on) Relationships essential with other intermediaries	Organisation back office Moving away from core business
<b>Retailer</b> Historical investments in logistics infrastructure (shops, parking and DCs) Difficulty in integrating B2C with traditional logistics Possible reduction of economies of scale in traditional sales channel (substitution to on-line) High distribution costs	<b>General</b> Installation and information of products Lack of suitable logistics service provider Reorganisation of back office necessary Level of (internal) automation Uncertainties about international taxes, duties	<b>General</b> Absence of suitable logistics service provider Level of (internal) automation Uncertainties about taxes, international authors rights Uncertainties about security of payments Privacy of consumer Heterogeneous demand side of market	<b>Retailer</b> No added value to chain with digital distribution Reduction of economies of scale in traditional sales channel (substitution to on-line) Additional knowledge needed for on-line distribution (copyright and so on) Relationships essential with other intermediaries
<b>General</b> (HACCP) requirements with regards to transport			<b>General</b> Absence of suitable logistics service provider

### 5.3 Strategies in Logistics



In general, the possibilities of a strategy based on e-commerce depend on the kind of product. Schellekens <sup>43</sup> argues that not all products are suited to on-line selling. He distinguishes three categories:

1. **Standard** products with brand recognition are ideally suited to being sold over the Internet. When the consumer buys these products, he knows what he is getting. They are often repeat purchases, whereby *branding* is important, ie profiling the brand.

<sup>43</sup> Emerce, September 2000



2. **Complicated products**, such as computers and electronics. From the point of view of prices it is worthwhile being able to order a laptop directly from an Internet site in Taiwan. Problems are likely to emerge if the products prove to be faulty. One possible solution is to set up a *kind of receiving centre* where the client can go for service in his own vicinity.
3. **Price products**, ie products where the consumer looks only at the price when making a purchase. However, not all vendors have control over the costs that will be incurred. They involve buying and distribution, but also taxes, which are not yet harmonised internationally.

There is a problem group within the food products category, consisting of products that require a high turnover rate in the shop due to a low profit margin, such as cartons of milk, sugar and flour.

In practice, companies develop their strategy related to the nature of the product and against the background of the various barriers and enablers that apply to the company. When dealing with B2C the following strategies can be distinguished:

#### 1) **Strategies of large manufacturers**

Those who do not have any knowledge or experience with direct sales and distribution to consumers may explicitly choose not to develop any e-commerce (B2C) business. These players deliberately remain faithful to their traditional core business and/or they realise that the distributive trade (retailer) has a dominant position in the chain.

Unilever deliberately does not choose a direct (sales) approach towards the consumer with respect to a number of product (groups) in the food products segment, based on two arguments. The first *barrier* is that the retail sector's supply chain is very complex, which is why it is difficult to enter this segment. The second reason is that retail is organised extremely efficiently as far as logistics are concerned, and has achieved large economies of scale in handling, consolidation, distribution and transport. At best, Unilever will try to gain a share in Internet sales through the sale of a number of high quality products in a new niche markets (NT, October 2000).

##### 1a) **Niche market strategy**

Opportunities for using e-commerce are highest in niche markets where a communicative value can be added to high quality products.<sup>44</sup> An illustrative example is Hot Orange.com. This organisation pays a great deal of attention to communicative packaging and focuses on the convenience consumer who wishes to buy luxury products, instead of focussing on *price buyers*. For consumer products with a low value, looking for added value in packaging and image is not an option.

##### 1b) **Strategies for branded products**

Manufacturers with a branded product have bigger opportunities to sell directly to the consumer. From this point of view *branding* is essential. For example, Nike's core business is solely to position its brand. All other activities, including production, are outsourced. But even when this kind of manufacturer takes the initiative of selling directly to consumers outside the traditional sales channels, its initiative can be obstructed by the retail sector. Levi Strauss and Dell Computers are examples of this.

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<sup>44</sup> van der Laan, 2000

The afore-mentioned example of the American Dell Computers illustrates that is not easy to sell directly to consumers without other links in the chain becoming involved.

When selling a computer that was largely put together by the consumer himself, Dell Computers in the US quickly saw the need to open a number of information and training centres as well as service desks. Selling a computer proved to be more than delivering a box full of hardware. Dell was forced to use traditional sales channels (as well) by the larger buyers in particular.<sup>45</sup>

Given that, at present, there are not very many logistics service providers who can guarantee efficient distribution to the client, a number of manufacturers are carrying out this function themselves, as yet largely via existing channels such as for example PTT Post and Van Gend en Loos.<sup>46</sup>

## 2) Retail strategy

Until now, retailers have not had any immediate reasons to sell on a large-scale basis over the Internet. If manufacturers (jointly) start selling directly to consumers, retailers will swing into action. Retailers have already ensured for some time that they keep up to date with developments in order to be able to step in at the appropriate moment. It is illustrative that AH has been experimenting with James Telesuper since 1987 and still has not decisively chosen the direction of its e-commerce strategy.

TESCO, one of the largest retailers in Great Britain, serves the consumer directly by picking the order which was given over the Internet in the supermarket closest(!) to the consumer and delivering it to his home. Within this procedure it can occur that the products for the consumer come from a competitor's store, from a different retailer. The American Peapod that was taken over last year by Ahold also works according to this principle. Aside from commercial considerations, the most important reason for this take-over was to increase the knowledge about B2C sales and distribution within Ahold.

In the Dutch situation this kind of procedure would lead to a relatively (too) high proportion of the distribution costs. Aside from Peapod, Ahold has also taken over Streamline.com. At present the way in which AH may want to introduce any large-scale e-commerce in the future is based on the Streamline principle: a structure with a large number of regional, specialised distribution centres where the orders are picked out at client level and delivered. AH is convinced of the fact that traditional logistics organisation is not appropriate for deliveries to individual consumers, and that with e-commerce initiatives, a specific logistics organisation and/or back office must be set up outside existing infrastructures.<sup>47</sup>

Manufacturers' ability to achieve sales initiatives over the Internet is often determined by the retailer's strategy. When choosing whether or not to switch to e-commerce himself (B2C), a retailer will draw the conclusion that traditional sales in stores can be substituted for sales over the Internet.

In the first instance retailers can choose from two main strategies:

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<sup>45</sup> EIM, 1998

<sup>46</sup> see Hotorange.com

<sup>47</sup> The Economist, 2000



- **Offensive:** e-commerce as a complementary sales channel for increasing revenues and profit in existing markets, or to serve new markets.
- **Defensive,** by expanding the social function of the store network and by creating more on-site added value for the consumer.

The largest retailers usually choose for a combination of the two: a **pro-active** strategy: via e-commerce pilot schemes and experiments they remain up to date with opportunities and developments, which prevents them from falling behind with the information they possess, when faced with large-scale initiatives of third parties (manufacturers, newcomers, mail-order companies) and enabling them to act immediately if necessarily.

### 3) Strategies of wholesalers and mail order companies

Due to the new possibilities of the Internet some market partners can play renewed roles in the chains, for example specialised wholesalers and mail order companies. This is particularly true for wholesalers with experience in distribution and order picking at individual client level. On the other hand, the wholesaler's added value will be reduced in the sales and distribution channels where digitised products are delivered to the client. Mail order companies such as Wehkamp have knowledge and experience in the intricate end distribution of products. For them, e-commerce is a **logical next step**, which also saves them the costs of expensive catalogues.

### 4) Clicks & bricks strategies

E-commerce is an essential part of the company strategy for the *newcomers*, who use an *offensive* strategy.

There are just a few companies that do not experience problems with the completion of the order. Not coincidentally these are companies that are experienced in distance selling: the old-fashioned mail order companies. They know how to deal with convenience buyers. Wehkamp is one of the few web stores that says it is making a profit. The mail order company estimates its Internet sales revenues to be 55 million guilders. That is around eight percent of total revenues. According to hearsay, a company like Wehkamp is the largest credit manager in The Netherlands and has a lot of experience with payment defaulters. They do not deliver in certain areas because there the chances of a high percentage of defaulters are too large. Wehkamp appeals to the same target group with both its website and its paper catalogue. Approximately eighty percent of the Internet clients were already *paper clients*. Wehkamp's head of communication expects the catalogue and website to continue side by side. The catalogue appeals to emotions. "It is nice to leaf through a book like this. The Internet is not friendly. That's why you have to provide a lot of *rumour around the site* to pull people towards your website".<sup>48</sup>

<sup>48</sup> Intermediar (Intermediary), November 2000

#### 5.4 Logistics structures



In the literature a large number of possible logistics structures are mentioned for delivering directly to consumers. These can be coupled to roughly two kinds of players.

##### *Mail order companies*

First of all, there are tailor-made logistic structures that have been around for a while and that are now being used for e-commerce. These are often efficient logistics structures such as those used by mail order companies. See also the previous paragraph.

##### *Newcomers*

These use experimental structures extensively. One example is the pizza delivery company Al Capone. See the box below. Collection points at petrol stations, car parks and employers are also being used. They are also thinking about using small safes that could have PIN card capabilities. This could happen in the Kenniswijk experiment, an experiment whereby with government aid more than 80,000 inhabitants of an area in and around Eindhoven have been provided with Internet services.

An example of an organisation that distributes directly within an existing framework is CD On. This organisation started *Speed 45*, which is an experiment with pizza deliverer Al Capone to deliver a CD to a client within 45 minutes. At present the experiment is limited to Amsterdam and its surroundings. CD On delivers the CDs from its central distribution centre in Almere, partly combined with delivering fresh goods to Al Capone's. The client pays a delivery charge of five guilders for the CD, unless he buys a pizza as well, in which case delivery is free. CD On wishes to try additional alternatives. The free daily newspaper Metro is part of the same group as CD On. Metro is capable of delivering to a large number of railway stations twice a day. The possibilities are being considered of combining B2C deliveries with newspaper deliveries.<sup>49</sup>

However, for the most part e-commerce is fitted into existing structures. See also the retail strategy and the manufacturing strategy in paragraph 5.3. Innovative logistics structures for the food products industry in The Netherlands exist only in theory. The innovating practical examples described previously and below predominantly refer to the United States. That is partly due to the differences in the structure of the foods products markets in the US and The Netherlands. In 1997 the NEA listed the following as the two most important differences:

- In The Netherlands the average cash register receipt in supermarkets is 35 guilders and in the US more than 200 guilders, which is why the extra fixed costs of e-commerce for picking orders and home delivery can be *spread out* over more products.

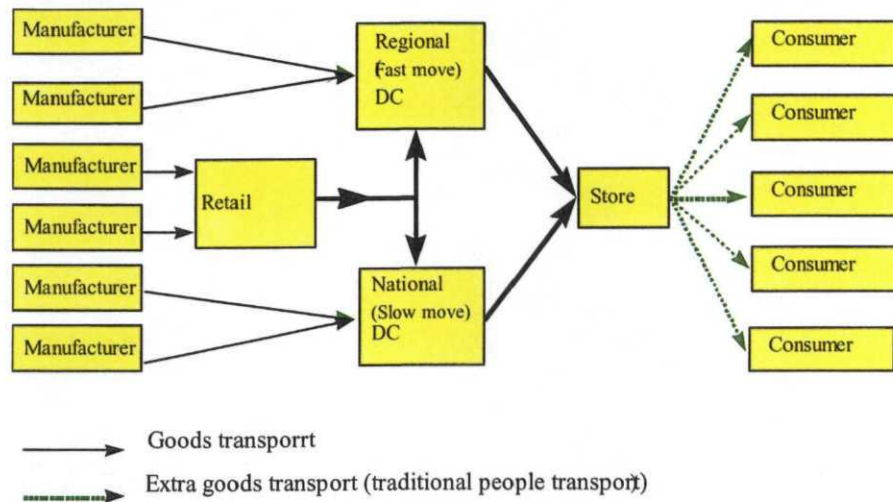
<sup>49</sup> Emerce, September 2000



- In The Netherlands distance to the shop poses practically no barrier at all, in contrast to the US. The geographic spread of supermarkets in The Netherlands is very wide. That is why home delivery, in general, is more attractive to consumers in the US.

A closer study of the logistics possibilities for the retail sector shows that there are roughly three alternatives for the direct delivery of food products to consumers by traditional retailers.<sup>50</sup>

**Figure 5.1**  
Alternative A - Home delivery from the store  
(like in the case of TESCO or Peapod)



In the first alternative, products are transported from the manufacturer, via the wholesaler if necessary, to the retailer's distribution centres. The fast moving products are taken to the regional DCs and the slow moving products are taken to the national DC. In this route the retailer leads the direction, which implies that the retailer agrees with the manufacturer that the latter delivers to the DC via a transporter selected by the retailer. The timeframes for delivery, delivery frequency, delivery size, packaging units and the carrier of the products are largely determined by the retailer. Handling to DCs and within them is optimised by the retailer over (external) transport.

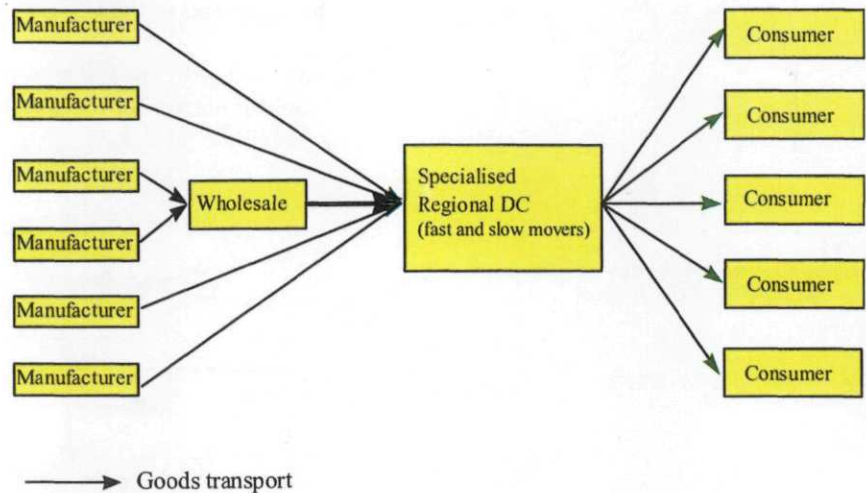
After *cross-docking* in the retailer's distribution centres, the products are delivered at store level. Only the highly specialised and/or regional products are distributed directly from the manufacturer to the store. Based on this procedure, the retailer keeps control, not only of the logistics function, but also the commercial function, and it is for him to decide in which way the products can be offered and sold to consumers. After the products have been placed on the shop shelves, they are taken off the shelves and gathered together using the customer order provided over the Internet, and subsequently taken to the customer. This distribution method can be set up within the traditional logistics infrastructure. Thus the two additional activities with regards to the traditional logistics structure are picking out the order in the shop and distributing to individual customers.

TESCO (UK) and Peapod (US) are two retailers who operate according to the described procedure. Picking out the order and distributing take place from the supermarket closest to the customer. It is possible that the customer in England

<sup>50</sup> van der Laan, 2000

would place an order with TESCO and would receive his products from a shop owned by the competitor Sainsbury.

**Figure 5.2**  
Alternative B - On-line direct delivery from specialised DC (Like in the case of Ahold's Streamline)



With *direct* distribution to consumers from a specialised distribution centre a new logistics distribution structure is essential. Manufacturers deliver, whether via a wholesaler or not, to a retailer's specialised regional distribution centre. In this regional distribution centre the retailer is required to have his entire range available. The retailers' regional distribution centres are specialised in picking out orders and distributing individual client orders. In order to guarantee a reasonable processing and/or delivery time, retailers will need to have this kind of specialised distribution centre available for each relatively small geographical area. With an actual large-scale implementation of this distribution method, manufacturers and wholesalers get a larger number of delivery addresses than is currently the case, thus resulting in a relatively fragmented distribution flow between manufacturers and the retailers. To date we have only seen practical applications of this concept in the United States.

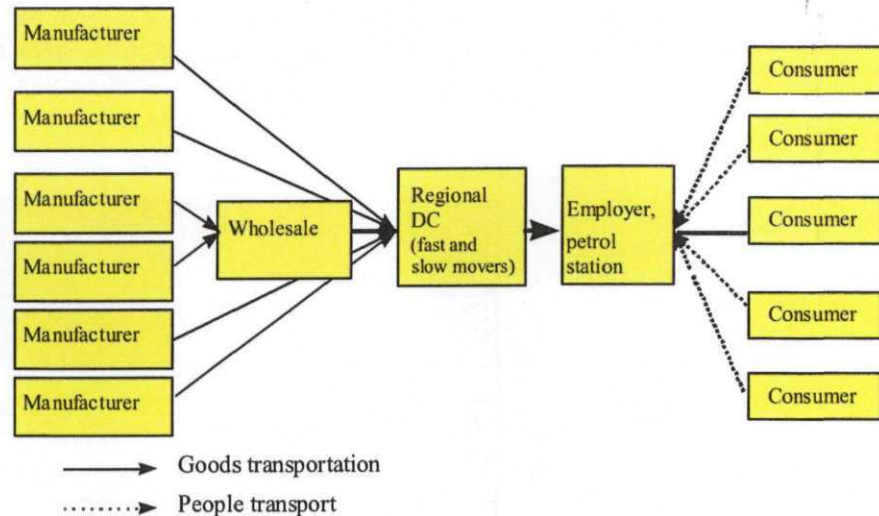
In the literature it is assumed that this distribution method is the only one that is commercially viable and with a chance of success. Next, the actual practical possibility of this distribution alternative depends on an adequate size of:

- the number of order lines per order,
- the volume of consignments,
- the number of orders,
- the number of returns,
- the storage life,
- the number of fixed addresses,
- the level of monostream culture,
- the degree to which delivery addresses are spread out,
- opportunities for gaining insight into individual customer's wishes.



Figure 5.3

Alternative C: on-line via local distribution points (for example petrol stations, the employers' premises)



In a different way to the alternatives described earlier, consumers can play an active part in the distribution process. From the traditional distribution centres, such as alternative A, or from specialised distribution centres such as in alternative B, the products can be distributed to the consumer's work place, or to places he passes on the way to work, such as a petrol station. In this distribution alternative the *bringing system* is partially replaced by a *collecting system*, whereby the consumer takes care of the last element of distribution. In this alternative the possibilities for the retailer to consolidate are relatively big.

According to Machielse, a possible paradigm shift that will take place because of e-commerce<sup>51</sup> is to do with the reversal of the *collection system* to the *bringing system*. Due to the emergence of the bringing system logistics organisation undergo a shift. Product logistics will prevail over transport logistics. *Product logistics* stand for a transport organisation and approach that is tied into the specific nature of the transported product. *Transport logistics* are in principle independent of the nature of the transported goods, but are tied to the means of transport, such as containers. In the transport sector transport logistics are at present the over-riding consideration. Low costs and a high degree of capacity utilisation are seen as the primary distinguishing factors between competitors. Due to the emergence and application of IT, the Internet and e-commerce, the fact that product logistics are becoming more pre-eminent is almost a logical, evolutionary development.

<sup>51</sup> 2000

#### 5.4.1 Costs of retail logistics structures

The table below contains an overview of the cost proportions of the various distribution activities within the three alternative distribution methods described, set next to those of traditional food product distribution. The costs are given in a percentage of the sales price.<sup>52</sup>

**Table 5.4**

Comparison of distribution alternatives; the distribution costs as percentage of the sales price

Activity	Traditional retail	Alternative A On-line from the store (Tesco, Peapod)	Alternative B On-line directly from specialised DC (Streamline)	Alternative C On-line via local distribution points (petrol stations, employers)
DC Overheads	1.2	1.2	4.5	6
DC receipt and storage	0.5	0.5	0.5	0.5
DC order picking	2.2	2.2	7.5	7.5
Transport from DC to store	0.9	0.9	-	0.8
Overheads store	2.4	2.4	-	-
Store receipt and storage	1.5	1.5	-	-
Store shelf filling	3	3	-	-
Customer order placement	-	3.2	3	3.4
Store order picking	-	5	-	-
Point of sale	1.2	1.2	1.2	1.5
Transport to home	-	5	8.5	5.5
Return flows	1.2	2	1.8	2.3
Customer service	0.9	1.9	2.5	3
Total	15 %	30 %	29.5 %	30.5 %

Source: Van der Laan, 2000

The distribution costs of the on-line food products sales prove to be twice as high as the distribution costs within traditional retail in The Netherlands, regardless of whether one is looking at alternative A, B or C. The traditional retail sector seems to be extremely efficient, in part because the customer carries out the most labour intensive part of the work: picking out the order in the store and transporting the goods to his home. The costs of these two activities are, on average, 10% of the sales costs. There is a further five percent increase of the costs because of IT investments, order management and sales service. These list (fixed/overhead) costs obviously will be higher if market penetration is small.

Nonetheless, the customer saves the time necessary for shopping when he has the goods delivered to his home. He does pay a higher price for the product, the service and the convenience. In order to compare the alternatives mentioned based on costs, it will be necessary to quantify the time saving and the increased customer service. This is not easy because the quantification will be different per customer (difference in value placed on travel time).

<sup>52</sup> (van der Laan, 2000).



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A noteworthy point when comparing these alternatives based on changes in transport flows is the substitution of people transport by goods transport. On balance, alternatives A, B and in part C bring about more goods transport, each of them to varying degrees, and a decrease in people transport - or at least in theory. Whether, in practice, people go to the stores just as frequently as before, but taking fewer products home with them, needs investigating.

It is plausible that the different alternatives will bring *different spatial patterns* with them for goods and people transport. We were unable to find any descriptions of empirical observations in the literature.

The comparison of distribution alternatives makes it clear that the traditional retail channel is highly efficient due to knowledge and experience built up over years. The learning curve of the traditional retail sector is not comparable as yet unable to the three alternatives described.

#### **5.4.2 Development of new logistics structures in actual practice**

It is not possible to predict which alternatives in the logistics structure will be developed.<sup>53</sup> More than 40% of goods purchased over the Internet are delivered too late to the customer, and 11% of products do not arrive at all. That illustrates how difficult logistics fulfilment is at present. A large-scale introduction of e-commerce within the current infrastructure will lead to high distribution costs and is commercially irresponsible.<sup>54</sup>

In the literature a relatively large number of innovative logistics structures are described. In practice they are not yet visible. Products that have been ordered over the Internet can in principle be delivered via existing channels, ie wholesale, distribution centre and retail sector. The existing distribution structure will not change much in many cases, although retailers will fulfil an intermediary function even more strongly. In The Netherlands most examples of direct product distribution to consumers take place within the existing, traditional sales and distribution channels. Integrators such as FedEx and UPS play an important part in this process. In addition, organisations such as PTT Post and Van Gend & Loos are widely used.

E-commerce can also influence transport flows in cases where products that were purchased via the Internet are distributed within the traditional existing logistics structures. For instance, an increase in the transparency (information) within a chain can influence customers' ordering habits and along with them the ordering and delivery frequencies.

The greatest (potential) differences between the traditional logistics set-up and e-logistics are expressed in the figure below.<sup>55</sup>

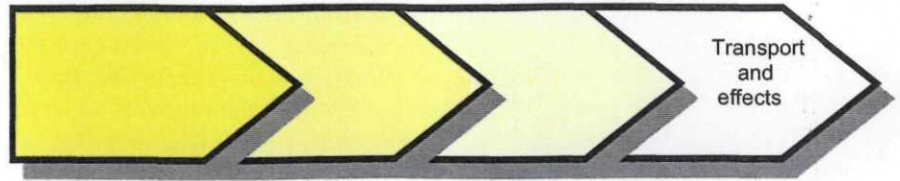
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<sup>53</sup> Inkoop en Logistiek (Buying and logistics), November 2000

<sup>54</sup> I&L, November 2000

<sup>55</sup> WMS = Warehouse Management System  
TMS = Transport Management System

## 5.5 Transport effects in the B2C segment



The strategies and structures described in the literature are based largely on theory rather than empirical data. The number of experiments in logistic structures illustrates the fact that many organizations are still looking. This makes it difficult to determine the effects of application of e-commerce for transport in the B2C segment. The literature available on the relationship transport and e-commerce relates to the *potential* transport flows generated by a given logistic structure or strategy. For example, IG&H regards the most important differences those between e-tailers and traditional retailers.

**Table 5.5**

Main differences between traditional distribution and e-logistics

Traditional logistics		E-logistics
Batch oriented	→	Real-time ordering
DC oriented towards towards shipment of boxes and pallets	→	DC oriented towards individual articles
Relatively few return flows	→	High percentage return flows (10 - 40 %)
Limited number of fixed addresses	→	Many changing delivery points
Product availability	→	Fulfilment
Build to stock/ forecast	→	Assemble to order/ Build to order
Warehousing	→	Consolidation
Delivery at retailer nearly always possible	→	Consumer is almost never at home all day
Heterogeneous processes	→	Standard processes
Cost reduction	→	Value creation
Forwarder	→	e-market place
Forecast	→	End-cast
Exclusive EDI-link	→	Internet XML/ HTML

### 5.5.1 Risks and uncertainties with e-fulfilment

The major problems with logistic deliveries (e-fulfilment) involve according to Andersen Consulting<sup>56</sup> the direct and final distribution to the consumer. The problem areas as percentages of the total number of (B2C) orders booked are stipulated hereunder:

- item not in stock (64%),
- late delivery (40%),
- high delivery charge (38%),
- communication problems and after sales service (36%),
- uncertainty and omission of a purchase acknowledgement (28%)
- restricted assortment available via Internet (27%).

On the basis of an analysis of the available literature a number of general points of attention and/or bottlenecks can be added to this list in relation to e-logistics in the B2C segment:

<sup>56</sup> 1999



- Guaranteeing a narrow time frame, determined by the consumer, is essential but may be for the time being difficult or impossible to ensure.
- Producers and retailers believe that logistic service providers are as of yet unable to realize effective and (cost) efficient *fulfilment*. Problems associated with this include the probability of large return flows resulting in an increase of the number of vehicle-kilometres. The relatively extremely high distribution costs are also a problem; they result specifically from the relatively small number of drops per street and what are for the time being the lack of opportunities for consolidation.
- When determining the influence of e-commerce on the number of vehicle-kilometres account should be taken of the potential *substitution of personal transportation by carriage of goods*. Consumers after all no longer have to leave home to purchase products and this may result in a reduction of personal transportation.
- Reliability appears to be more important than speed.
- Several documents anticipate that sales to consumers via Internet will fragment the goods flows (higher shipment frequencies for smaller shipments) and that the development of goods flows will become less predictable.

The possibility of adaptations to the logistic structure makes regionalization of production interesting. In the spatial arrangements where attention has been devoted for some time to the impact of the disappearance of time-space this potential development is recognized and stimulated by the emergence of Internet and e-commerce the subject of attention from another angle. The reason that Internet and e-commerce probably reinforce this is because transport is about to become a value-contributor to production and service chains rather than being seen as a cost item. Transport will in this way become a distinguishing part of the product or service that is being sold. The time at which the product can be delivered will becoming a competitive and price-determinant aspect in the sale. As for the pizza courier who has to have delivered the pizza within 30 minutes, otherwise you get it for nothing. This makes it interesting to organize the location where products are produced or services provided differently and to restructure them spatially.<sup>57</sup>

## 5.6 Conclusions

There is a major difference between what market parties intend with respect to direct distribution to the consumer (there are many innovative ideas and plans) and current practice in which the distribution to consumers is shaped and confined mainly to traditional systems and infrastructure.

The literature that is currently available is engaged mainly in the description of expectations, possibilities and visions of the future and information directly based on empirical data is sparse. The descriptions in this chapter are therefore based mainly on the visions of the future of various authors and organizations as formulated in the literature. The perspectives and potential applications of e-commerce within the B2C segment in the literature would appear to be more extensive than initiatives actually deployed in reality.

This would appear in first instance to be explained by the fact that the interests and benefits listed for embracing e-commerce are for the various market parties

<sup>57</sup> Machielse, 2000

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apparently less compelling than the effort thought to be needed to remove the various obstacles thereto. The opportunities or restraints for e-commerce application are determined after all by the total costs and benefits applying for a specific market party.<sup>58</sup>

Added to that within the traditional market structures and associated power balances it is for some market parties scarcely possible to develop e-commerce activities. A large section of the available literature ignores such "soft" factors, taking a point of departure only the development of the (Internet) technology.

There are for all market parties pros and cons to providing products on Internet, making it unclear as to which market parties will (be able to) introduce e-commerce on a large scale. The obstacles cited frequently in the literature are the:

- present market structure,
- traditional balances of power,
- (internal) level of automation,
- present logistic organization and structures that are not geared to individual deliveries,
- restricted consumer demand caused by high selling prices resulting from the distribution costs,
- lack of knowledge on selling to and supplying individual consumers,
- historical investments in logistic infrastructure (shops, parking and DCs),
- the absence of a suitable logistics service provider,
- level of automation (internal),
- type of product (seeing, feeling, smelling and value),
- consumer demand; uncertainties with regard to security and payments and consumer privacy and
- bottlenecks in the case of consolidation beyond the distribution chain (time frames).

The present shortage of IT specialists does not feature much in these reviews. **Retailers** are experimenting and ensuring that they keep abreast of developments in the area of e-commerce. This means that retailers will have in the case of large-scale initiatives on the part of third parties (products) no knowledge deficit and will be able to participate directly. On a modest scale direct sales to consumers via Internet, as complementary sales channel for increasing sales and profits in existing markets, or for the service of new markets, would appear to offer potential perspective. It also represents an expansion to the social function of the store organization.

The most important reason for **producers** to cultivate e-commerce is its potential for forging contacts with consumers outside the wholesale and retail trades. They have now little opportunity for this because retailers are in both the commercial and the logistics area dominant (see, among other items, purchasing power).

The attention of **new actors** in the various markets, the so-called *clicks*, is aimed mainly at the front office activities: the design of the web site and optimization of the sales activities via Internet. The back office (fulfilment) activities, the logistic organization and distribution of the goods sold via Internet, receive less attention. This despite the fact that this so-called *e-fulfilment*, the manner in

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<sup>58</sup> see also paragraph 5.2 Drivers, restraints and enablers



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which the products are distributed to the consumer is regarded as the critical success factor for sales to consumers via Internet.

For example, more than 90% of consumers who placed orders via Internet during the Christmas period of 1999 was dissatisfied with the delivery. The vast majority of the Christmas presents was delivered to their homes only in January and February 2000.<sup>59</sup>

A relatively large number of innovative logistic structures are described in the literature. These structures are in The Netherlands up to now scarcely seen. Products that are ordered via Internet can in principle be delivered via existing channels – wholesale – distribution centre – retail trade. The existing distribution structure will in many cases scarcely change, although the retailer will acquire to a greater extent the function of middleman. Most examples in The Netherlands of direct distribution of products to consumers are realized within the existing traditional sales and distribution channels. Integrators such as Fedex and UPS play an important part in this. Organizations such as PTT Post and Van Gend & Loos are also widely used.

Which innovative variants will prove capable of development in the logistical structure is impossible to predict. The fact that over 40% of the products purchased via Internet is delivered late and that 11% of the products is not delivered at all is illustrative of the fact that logistic fulfilment remains for the time being difficult. Large-scale introduction of e-commerce will within the present infrastructure result in (very) high distribution costs and is from a business economics standpoint unjustified.

There is little study material available on the potential savings in the B2C-segment. Sales to consumers via e-commerce certainly save costs for retail outlet rental, fittings and staff but on the other hand extra costs are incurred for computers, software, house-by-house distribution etc. Some sources maintain that it is specifically the distribution costs that are high. The distribution costs for on-line foodstuff sales turn out to be twice the distribution costs within the traditional retail, irrespective of whether variant A, B or C is opted for. Traditional retail methods appear to be very efficient partly because the consumer does the most labour intensive work: picking the orders in the shop and transporting the goods to his home. The cost of these two activities is traditionally on average 10% of the selling costs.<sup>60</sup>

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<sup>59</sup> Transport Echo, 2000

<sup>60</sup> Van der Laan, 2000

Investigative study into e-commerce

The study was conducted in a series of stages. First, a literature review was carried out to identify the key issues and challenges in e-commerce. This was followed by a series of interviews with experts in the field. The interviews were conducted in a semi-structured format, allowing the researcher to explore the key issues in depth. The data from the interviews was then analysed to identify the key findings. Finally, a series of focus groups were conducted to validate the findings and to explore the implications for practice.

The findings of the study indicate that there are a number of key issues and challenges in e-commerce. These include the need for a secure and reliable infrastructure, the need for a clear and concise legal framework, and the need for a high level of customer service. The study also identified a number of key opportunities for e-commerce, including the potential for increased sales and the potential for improved customer service.

The study has a number of implications for practice. First, it highlights the need for a secure and reliable infrastructure. This can be achieved by investing in a robust network and by implementing strong security measures. Second, it highlights the need for a clear and concise legal framework. This can be achieved by working with government and industry to develop a set of clear and concise rules. Finally, it highlights the need for a high level of customer service. This can be achieved by investing in a high level of customer service and by ensuring that the customer is always at the centre of the business.



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## 6 Abstract

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### Background

In a very short period e-commerce has become an indispensable feature of our society. Following on from that, a number of authors had expressed opinions on the potential effects of the emergence of e-commerce for transport. These varied from a substantial increase in the number of journeys, and even the complete disappearance of the retail trade, with a number of authors seeing no part any more for the traditional logistics service provider.

### Problem

The Ministry of Transportation had expressed its concern that: *there is a great lack of clarity as to the scale, the significance and the potential effects of e-commerce on the logistic chain and for transport.* Can we anticipate a new wave of goods transport as e-commerce takes over the world?

### Study protocol

To get a grasp of the study questions as formulated in chapter 1, a literature study has been opted for.

### Definition E-commerce

E-commerce is trade via an electronic medium. Four different approaches for defining e-commerce emerge from the literature:

1. E-commerce and Internet as electronic medium. E-commerce is for many equivalent to using Internet.
2. Nature of the activities, what happens. These approaches vary from e-commerce as a legal entity to a manner of doing business, including interactive electronic product design, e-marketing etc.
3. The question "who is trading with whom?". Are they both businesses - *Business to Business (B2B)* – or do we have businesses with consumers - *Business to Consumers (B2C)*
4. Type of product or service as approach: are they standard or special products: is it *Catalogue e-commerce* or *Auction e-commerce*?

This brought us to the following points of departure for this report:

- For us E-commerce is not just a legal activity; attention is also paid to the significance of activities and interaction preceding and following it.
- The emphasis is on application of e-commerce in the B2B and B2C segments.
- Attention is devoted to the opportunities (or lack of them) that e-commerce applications offer for a large number of products, digital and tangible, standard and special.

### Figures

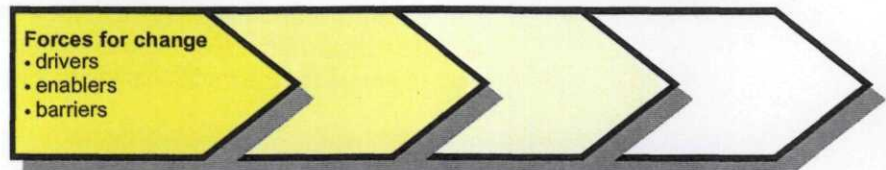
In literature figures on the extent and growth of e-commerce tumble over one another. The most important estimates of growth vary from 46 to 125 percent per year. The variation of figures on e-commerce is due specifically to:

- The various definitions that have been adopted.
- The lack of an unambiguous statistical system based on empirical data.

- The fact that conclusions are often based on a limited number of interviews or questionnaires, quite often held at a few successful American companies.
- The fact that growth from zero to any value is in percentage terms relatively rapid, irrespective of how small or large the figures actually are in absolute terms. The starting point for B2C is certainly low. For 1999 for example the market share of B2C was estimated to be 0.34 percent of the total retail trade in The Netherlands.

#### **Business to business**

More than 80 percent of e-commerce is B2B (calculated in sales turnover).



Businesses cite three *external* developments that are impelling them towards e-commerce (drivers):

- the increasing rate of change in general and the demand for rapidity of response in particular;
- the increasing geographical scale of operations and further internationalization of markets and
- the increasing demand for reliability and quality of products and services.

They also cite across the board the following *corporate motives*:

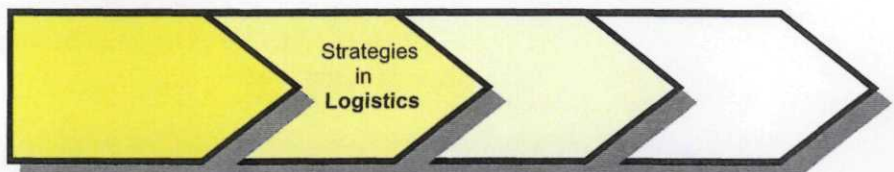
- the pursuit of cost reductions (transaction costs, purchasing costs and inventory costs).
- opportunities for increased sales/ market share and service optimization.
- the need for strategic customer information as management instrument for rationalizing and integrating corporate processes.

Internet facilitates as enabler, more than Electronic Data Interchange, the step towards e-commerce.

The barriers to application of e-commerce also appear to be extremely varied:

- the need to change procedures in the corporate organization,
- the lack of a standard for software, and/or
- the lack of a uniform international legal framework.

Some authors see European plurality of corporate cultures as an obstacle to e-commerce. Others anticipate that the experience now being gained will in a few years provide Europe with a lead over America.



Practically every business has adopted e-commerce as part of its corporate strategy. 97 percent of major European companies participated in 2000, each for individual reasons. Various types of electronic market places were used, often several simultaneously. Automotive and PC manufacturers, the chemical industry and retail have been extremely active, also in joint activities.

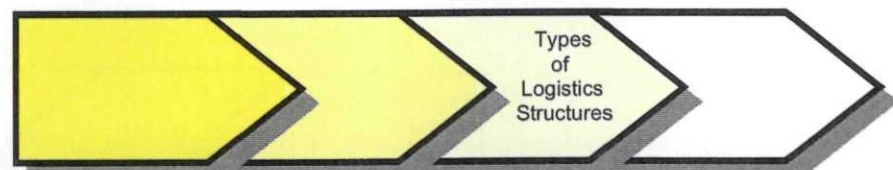


While for some businesses e-commerce is mainly a **cost strategy**, it is for others also a **distribution chain strategy**. The literature places great emphasis on the savings that businesses plan to realize with e-commerce. The percentage figures on potential savings vary widely, in specific cases by factors of ten. The general assumption is that all parties will win with e-commerce.

Major producers require their trading partners to participate, seeing e-commerce as a *qualifier*.

Many authors believe that the distribution chain strategy adopted by major producers and their customers will ultimately lead to:

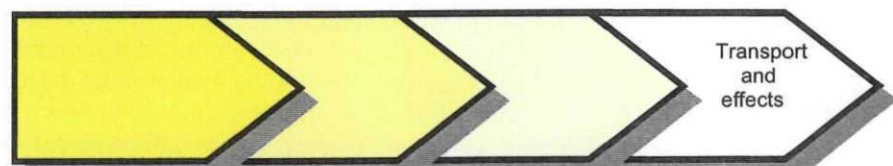
1. *elimination of middlemen*. Importers, wholesalers, forwarders, dealers and retailers will become superfluous thanks to the direct contact between producer and consumer. The OECD emphasizes in this connection the positive *facilitating* function of middlemen. While it does not anticipate the elimination of middlemen it sees a different role for them.
2. *changing relationships and more rapid recourse to contracting out*. Various authors believe that the ease with which Internet-sites can be created and ease with which products and services can be bought and sold electronically will encourage businesses to conclude temporary rather than permanent contracts. Other authors however note that electronic markets require that the buyer and seller trust one another. The question remains whether technical facility is in itself enough to sustain less permanent relationships.



There are a great many references in the literature to e-commerce's role in providing real-time insight into market developments for all parties in the logistic distribution chain and clear the way for entirely new advanced logistic structures allowing new virtual parties to combine the function of various traditional middlemen.

For the automotive industry in particular the literature indicates how these new logistic structures might look. Regional distribution centres with a combined service centre role play in this an important part.

Various authors anticipate a larger role for regional distribution centres. *Cross-docking*: (direct transfer from one mode of transport to another without storage at the DC).



The literature contains various hypotheses on potential transport effects:

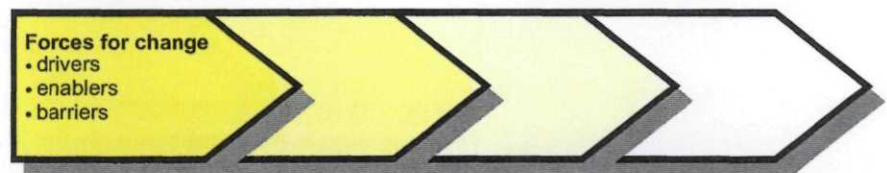
- It should be possible for all parties in the distribution chain to respond quickly to changes in market demand. That should result in a higher frequency of transport shipments with smaller shipment volume. With as

result fragmentation of transport. No attention is given to the possibility that new initiatives may be deployed in the market to group this fragmented transport once more. It is credible that such initiatives will emerge in response to the need to restrict transport costs.

- Rising demand for rapid response and rapid transport will restrict the opportunities for carriage by rail and water. This presupposes that international, domestic, regional and local transport will become less predictable. The question of to what extent this increased unpredictability can be reconciled with increased ease of transport scheduling due to greater transparency.
- Yet others suggest that e-commerce will provide many opportunities for swapping of freight, *freight exchanges*. It should be possible to construct logistical virtual networks flexibly in order to utilize available capacity and cargo space, to reduce empty journeys etc. by automated matching of many buyers and sellers. Some authors anticipate that in some instances a temporary network of independent businesses will emerge without hierarchic structure and based on transparent, flexible and dynamic relationships (see for example the contribution of Dialogic in the appendices report).

What requires to be examined is to what extent these hypotheses on potential transport effects merit support on the basis of empirical examination.

### **Business to Consumers**

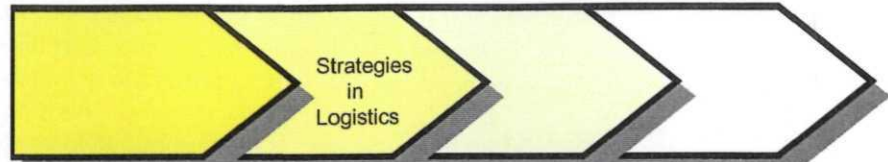


The motives and opportunities for selling products via Internet to consumers vary depending on the type of organization:

- Direct access to the market is specifically for *newcomers* an argument for adopting e-commerce. The *click&brick's* start from an Internet application and couple the distribution to it. The distribution system often presents them with problems.
- For *mail order businesses* costs benefits and the ability to use their customer records form the argument for adopting e-commerce. For them e-commerce is a logical development. They have substantial expertise in supplying consumers on an individual basis.
- *Retailers* have a dominant market position. Direct access to the market is for them therefore not an argument. E-commerce is for them rather a dis-investment relative to the existing retail outlet structure. The threat of third parties entering the market is the most important motivator. Unfamiliarity with supplying individual consumers is a handicap.
- For *major producers* and the *wholesale* segment potential access to the market may certainly be an argument that attracts them to e-commerce. Having a strong brand will simplify the move. But against that various businesses realize that it is not feasible to try to equal the efficiency that the retailers have already realized. And they will be unable to offer the consumer a total assortment, while also lacking knowledge of distribution to individual consumers.

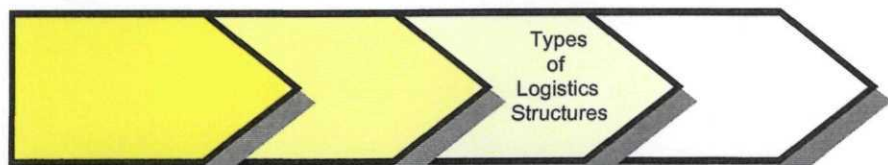


- There are for *consumers* a variety of reasons for responding to an e-commerce offer. For some it is the opportunity to find a rare item, for others the ability to choose from a gigantic assortment. Payment and distribution problems are often objections. The high penetration level of the PC and Internet make e-commerce in any event a possibility.



Opening an Internet-site is widely deployed corporate strategy. This is partly with a view to providing information, partly to create an electronic selling opportunity. The character of the strategy varies from business to business:

- For the *newcomers* e-commerce is an essential part of corporate strategy. They maintain an *offensive* strategy.
- *Producers* maintain in general a *restrictive* strategy. The literature indicates that they avoid or intend to avoid the middlemen. In practice however they cultivate the relationship with the retailer who is decisive for their access to the market. E-commerce is maintained as an additional sales channel. Only in some niche markets is the investment in e-commerce more offensive.
- *Retailers* maintain a *pro-active* strategy. By that is meant a combination of a defensive strategy - in the sense of having a strong market position to lose and wanting to prevent that - and an active strategy - in the sense of following closely the initiatives of others, and investigating, via timely experiments, the potential technical, organizational and marketing opportunities and obstacles.
- The strategy of *mail order businesses* focuses on *continuity*. They develop their strategy continuously in the direction of e-commerce, on the basis of their knowledge of detailed distribution and customer information.
- *Consumers* maintain an *exploratory* strategy. They use Internet increasingly for information and entertainment. Relatively few Internet users (1 in 7) buy via Internet. The main purchases are CDs and books, followed at some distance by software and travel vouchers.

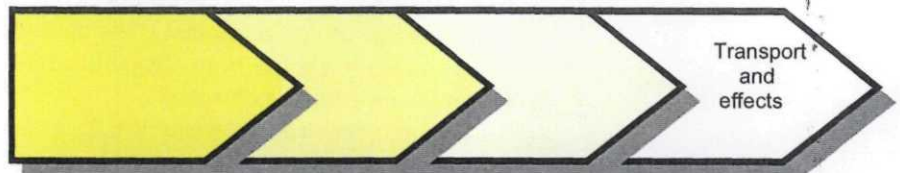


In literature an extensive range of potential innovative logistical structures are presented for supply to individual consumers.

In practice many deliveries are made via existing channels.

In all cases e-commerce turns out to be significantly more expensive than traditional retail. We encounter in the literature three different approaches:

1. The same distribution structure as for traditional retail with as additional feature order-picking in the retail outlet itself. The retail assistant does what the consumer would normally do. Some retailers operate in this fashion.
2. Deliveries from a regional distribution centre specialized in e-commerce and from there, delivery to individual consumers.
3. Delivery from a regional DC to local distribution points (employers, petrol stations etc.).



A variety of hypotheses are presented in the literature as to what the potential consequences could be of e-commerce for the carriage of goods. The most prevalent assumption is not so much that the freight volume will increase with e-commerce, but rather the number of journeys. TLN estimates the effect will be nine percent additional journeys. This is however based on the assumption that the final phase in the distribution to consumers is incapable of efficiency improvements. However, the greater the increase of transport costs, the greater the pressure will be to find efficiency improvements. There is for actual empirical changes to transport flows no information available.



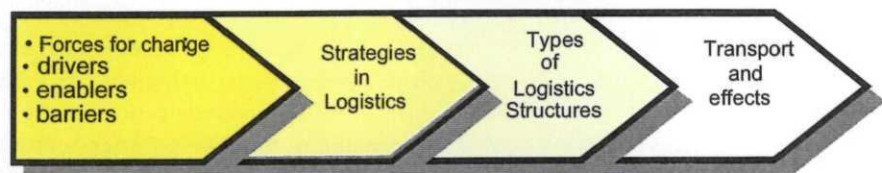
## 7 Conclusions

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E-commerce developments in the business sector are still for the most part at an early stage. The uncertainties with regard to the conclusions to be drawn for e-commerce and their effects on logistics and transport are therefore still very considerable. These uncertainties are quite naturally very pronounced in the study with the literature examination. The following factors, among others, play a role in this:

- the definition of E-commerce varies from study to study;
- the figures for the scale and growth of e-commerce vary greatly and are for the most part only expressed in financial terms;
- the structure of figures and statistics is unclear with a lack of unambiguous statistics;
- a lot of information and figures are based on short-term observations and individual cases. Representativeness and long-term developments are unclear and unreliable;
- almost nothing is known on the true nature and extent of effects on logistics and transport;
- the literature is largely derived from sources that are optimistic in their distribution in society of e-commerce developments. There is however a gap between the vision of new-economy businesses and consultants as to the possibilities of e-commerce and the true situation prevailing at present for businesses in the automation of their corporate processes.

Despite these restrictions the available knowledge about e-commerce allows us to draw conclusions explicitly. The implications of e-commerce for logistics and for transport were central to this inquiry. We present our conclusions along the lines of the framework which we have build our research on:



### The driving forces behind e-commerce

#### Drivers

1. Many participants hold arguments for becoming involved in e-commerce, but these arguments differ from participant to participant and in many cases are justified on a short-term basis. For businesses the most frequently heard consideration for starting with e-commerce activities is fear of *missing the boat*. For consumers the convenience.
2. The most important drivers for businesses to become involved in B2B e-commerce are a need for more information and management possibilities for the logistic chain and the shortcomings of existing logistic control

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systems, and its potential for cost reductions.

3. The most important drivers for businesses to become involved in B2C e-commerce are opportunities to increase market share in existing markets and to develop new markets and optimization of customer service (mass individualization) and its potential for cost reductions.
4. The increased rate of change, further internationalization and customer orientation all play a part in the decisions of businesses to participate in e-commerce.
5. For a number of businesses the ability to reduce costs is a persuasive argument for the step to e-commerce. Particularly important are transaction costs, purchasing costs and inventory costs.
6. Yet others are persuaded by strategic long-term arguments: the requirement to use strategic customer information for guiding the production and the entire logistic distribution chain, which is designed to result in a more rapid response to changes in the market demand, lower inventories and an enhanced brand image. E-commerce allows the processes in the logistic distribution chain to be accelerated and adapted to each other.

#### Enablers

7. Developments in the technology, such as mobile Internet applications, the liberalization of the national telecom sector and logistic expertise are general enablers that facilitate the further growth of e-commerce.
8. To a much greater extent than EDI Internet facilitates the adoption of e-commerce. EDI is as opposed to Internet a closed system for suppliers and customers with high implementation costs that excludes the end-user from the value chain.
9. Specifically for producers (traditionally bricks) a strong brand image is one of the factors that simplifies selling via Internet. Retailers already have access to the knowledge and information on selling to consumers.

#### Barriers

10. Short-term barriers are aspects such as security, identification, lack of software standards, an inadequate legal framework and available qualified staff. Internal corporate processes are moreover often not in order and not automated (a requirement for e-commerce). Future economy barriers may remain a problem for smaller businesses due to the required levels of investment.
11. In B2C E-commerce the extra handling and transport costs (reliable delivery to consumers' homes, return flows etc.) may constitute a significant barrier.
12. In the future however the European experience of working with a range of corporate cultures may represent an advantage relative to American businesses. The latter currently dominate e-commerce.



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### Logistic strategies

1. E-commerce is an unmistakable trend among businesses. Many businesses see e-commerce as a "qualifier". A great many businesses are on the move in the e-commerce area, but then for many different reasons.
2. For some businesses e-commerce is mainly a cost strategy but for others it is also a distribution chain strategy.
3. The literature refers frequently to the potential disappearance of middlemen, such as the traditional wholesaler or retailer of today, in favour of large advanced service providers. Setting aside a number of cases, no empirical justification has been found for a general trend along those lines.
4. Some authors comment critically on that hypothesis, emphasizing rather the positive function that middlemen have in the relations between parties. Various producers regard for example the present distribution structures of retailers to be extremely efficient and are for that reason reticent in adopting B2C; they restrict themselves to niches and concentrate on B2B. In view of the increasing interest in customer orientation these authors are more inclined to anticipate innovations at middlemen than their disappearance.
5. Many authors believe that the technical potential of e-commerce will facilitate continuously changing relationships between businesses. Whether relationships between businesses will change more radically has not been demonstrated. Some authors even expect e-commerce to cement relationships between businesses because changing relationships lead to too much uncertainty in practice.
6. In B2C the character of the strategies vary widely. Newcomers (*clicks&bricks*) maintain offensive strategies. Retailers maintain a pro-active strategy with e-commerce on an experimental basis. Producers maintain in B2C a restrictive strategy, limited by the balances of power in the market.

### Logistic structures

1. There are in the literature numerous references to the expectation that e-commerce will herald the development of advanced logistic structures. In many cases Dell and the automotive is cited.
2. Most hypotheses are based on the increasing importance of regional distribution centres. The expectation is that there will be in response to increasing fragmentation of goods flows by e-commerce, a further expansion of *cross-docking*.
3. There is little factual evidence of changes to the structure of logistic chains as a result of e-commerce in practice. In **B2B** only in a small number of individual cases have indications been found of real changes to logistical structures. These changes appear for the time being to be of an experimental character. In **B2C** the increase of product sales (books, CDs) via Internet is reflected up to now mainly in deliveries via existing logistic structures. For example partly via the standard services of integrators (Fedex, DHL, etc.) and postal operators. Retail operators carry out the order-picking for B2C and specifically from the retail outlet.

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4. There are however experiments in particular in B2C with deliveries via relatively simple existing distribution structures of third parties (combinations of pizza and newspaper distribution for example). Only a single retailer is experimenting with a separate DC.

#### **Transport effects**

1. There is practically no literature available on the transport effects of e-commerce. There is one single theoretical appraisal, but descriptions of actual effects are totally lacking. And to the extent that transport effects are capable of theoretical derivation, it is not possible to ascertain to what extent these effects are attributable to e-commerce or to other corporate strategies. There are no tangible indications that transport flows have actually been changed by e-commerce. But that is not the end of the story.
2. The hypotheses on transport effects are in first instance generally based on the expectation that e-commerce will result in a higher frequency of transport shipments with a smaller shipping volume. It is fair to assume that a fragmentation of transport will stimulate parties to improve the transport efficiency.
3. It transpires to be very difficult to predict the impact of e-commerce on the carriage of goods. In the first place there is little empirical data on the actual scale of e-commerce thus impeding any attempts to calculate that scale. In the second place all aspects of the relationship between e-commerce and transport are beset with uncertainty, particular in the area of logistical structures and logistic strategies.
4. Many articles and presentations emphasize transparency as a great plus-point of e-commerce for all parties. It remains however in the meantime a moot point whether transparency will really result in major changes to the organization of logistics and transport.
5. The most successful businesses have access to local networks. Commercial communications are most effective when they can rely on personal relationships. Electronic markets depend on trust between buyer and seller. That is why e-commerce will reinforce brand positioning, *branding*, and marketing.



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## 8 Starting points for policy and further study

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### 8.1 Introduction

This first exploratory study into e-commerce and its effects for logistics and transport is based on literature research. The study has because of the nature of the literature acquired a strong qualitative character. There are no figures known for the time being that substantiate the extent and the rate at which e-commerce developments have penetrated and will continue in The Netherlands. The nature and quantitative scale of the effects of e-commerce on logistics and transport are also unknown. This means therefore that the conclusions of the study and potential implications for policy need to be treated with the appropriate caution and that reticence should be exercised when relying on e-commerce developments.

Despite these limitations an attempt has been made to highlight from this study the most important elements in relation to the policy of the Ministry of Transport, Public Works and Water Management. Included in this are the possibilities for further studies

### 8.2 Starting points for policy

Under starting points for policy it is important to distinguish between:

- independent developments in relation to e-commerce and Internet in which the role of government is definitely that of shaping peripheral conditions, and
- developments that government deems to be desirable or undesirable and possibilities for deploying specific policies.

#### Future scale of e-commerce

One of the statements made about the scale of e-commerce is that it is both 'overhyped' and undervalued. The question whether e-commerce grows explosively in the future will depend in any event on the attitude of traditional businesses. Traditional businesses are as it happens much larger (sales turnovers, goods flows etc.) than the present new-economy operators<sup>61</sup>. Traditional businesses often have moreover due to their dominance in the logistic chain a "pulling effect" on their suppliers and customers. When a business moves into e-commerce, whether fully or partly, its direct trading partners will have to follow. The potential impact of those many large traditional business is therefore huge (General Electric is a good example of this). When monitoring e-commerce activities the traditional business segment will therefore be a very important target group. The factors that stimulate traditional businesses towards e-commerce will play a significant role in this.

#### Transparency of the market

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<sup>61</sup> By way of illustration the sales and profit of a traditional business like IBM is much larger than the total sales of the 25 largest new-economy businesses together..

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One of the positive effects of e-commerce and electronic market places is the increase of transparency in the logistic chain and the transport and distribution sector. Electronic market places have the potential for enlarging chain transparency and the requirement for example for reducing urgent shipments. Increasing transparency of market demand may on the other hand stimulate further inventory reductions that will then result in more frequent shipments of smaller loads (fragmentation). An instrument such as focused price strategy (increase of transport costs) may alleviate this. Policy in the area of pricing initiated by Transport, Public Works and Water Management may therefore influence the potential development of e-commerce.

Electronic market places such as for example freight exchanges (freight auctions, freight swapping centres) match potential customers to potential suppliers. A familiar feature in the transport sector is that outward-bound journeys are generally full, while for return journeys there's often not much to carry. In The Netherlands the utilization level of carriage (percentage of kilometres driven that a vehicle is loaded) of the professional transport sector is about 70%, while for private business transport it is about 67%. The basic problem is however that there is **no** mechanism for matching potential customers with potential suppliers of freight space and the result is more or less involuntary acceptance of empty return journeys and lower utilization levels.

Stimulating development and accepting innovations such as for example freight exchanges in The Netherlands together with innovative policies may therefore have a positive effect on the efficiency of the freight sector (and indirectly on safety and stability). One of the most important points for attention in the adoption of for example freight exchanges is that transport- & distribution operations may see them as a threat because of their perceived ability to depress transport prices.

#### Threat to traditional wholesaler

The increasing transparency may result in traditional participants in the logistic chain, who derive their position from obscure market and trading structures, coming under pressure. Simplification of the tangible logistic chain by elimination of middlemen is one of the possibilities. One example of this is the traditional wholesaler that fulfils in part a trading and in part a consolidation function. Because producers and customers can now trade directly there is an opportunity, not only for profit expansion, but also for direct, essential market information. It is relatively easy for logistic service providers to take over the consolidation function. The enlargement of freight packages means that there is more latitude for further potential efficiency improvements and consolidation of goods flows.

#### Transport prevention

Application of e-commerce may have positive effects in relation to transport prevention. This potential positive contribution will depend on the nature of the product and the necessity for the products to be physically present in the logistical chain.

- Digital goods; these products offer the greatest opportunity (music, books, post, documents). For these types of product Internet is a new, alternative distribution channel that renders physical transport superfluous. This provides a positive contribution to, among other policy objectives, durable transport, safe transport and accessibility.
- Elimination of links in the chain; Internet / E-commerce may render the physical presence of products at locations in the chain superfluous. This is



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conditional upon no physical product changes being effected at those locations. Examples are market places (auctions) and control locations (container cans in the harbour).

See also: Threats to traditional wholesalers.

#### Quality of the infrastructure and application of e-commerce

Application of Internet and/or e-commerce in logistic chains will lead to more transparency in among other area information and transport flows. This will increase the reliability in the chain (full shelves), causing inventory levels to decline, order frequencies to increase, the magnitude of shipments to decline and ultimately the number of vehicle-kilometres to increase. This increase of vehicle-kilometres may however negatively influence the reliability of the total traffic and transportation system by causing an increase to congestion (iterative process).

Besides the decline in magnitude of inventories, the number of inventory points in logistic chains may also decline. This enlargement of scale in production and distribution will cause the number of vehicle-kilometres to decline. Planning policies can be applied to exercise influence on source and destination relationships and hence on the number of vehicle-kilometres (bottlenecks, development of industrial parks).

#### Traffic and transportation effects distribution structures B2C

In the B2C segment three types of distribution structures have been identified. From the point of view of traffic and transportation effects the optimum structure is that in which the consumer collects the products himself at a location on his route between home and work (employer, petrol station, NS railway station). Within this distribution structure (*fetch system*) the substitution of goods transport by essential personal transportation is the largest.

The condition above is essential because it also avoids undesirable modal shift. After all in a traditional setting many purchases are made by bicycle or on foot (substitution of personal by goods transportation!). E-commerce continues therefore to exercise an effect on the relationship personal / goods transportation. It would therefore be advisable to raise with respect to this point the dialogue between DGG and DGP.

The distribution structures in which goods are delivered to the individual consumers, the so-called *bring systems*, result in larger negative effects. Examples: decline in safety (residential neighbourhoods), larger number of vehicle-kilometres and lower quality of life and accessibility. This type of distribution is currently being assessed by among others IBM in collaboration with EDAH supermarkets. Such practical applications do however provide opportunities for collecting empirical material and quantitative support for the assertions.

When this distribution structure (*fetch system*) is adopted by the majority of retailers, the significance of regional distribution centres will probably increase. Some adjustments will therefore have to be made to the spatial planning/structure. A distinction is after all in many cases drawn between national (slow moving products) and regional (rapidly moving) distribution centres.

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### 8.3 Starting points for further study

As stated the study results provide in the main qualitative building blocks for potential government policy. The results are moreover for the most part based on developments in the US and the UK. In order to create a solid basis of knowledge and understanding of the effects it is important to conduct further (empirical) study of the following aspects;

- The development both in scope and nature of e-commerce in The Netherlands in B2B and B2C:
  - the rapidity and nature of e-commerce developments at large traditional businesses (which core/peripheral activities on-line, which products and services on-line);
  - effects on other chain parties (result of dominant parties in the chain in relation to e-commerce);
- the positive and negative effects of e-commerce application in The Netherlands for logistics and transport in both B2B and B2C:
  - the effects in the areas of traffic and transportation, economy, urban and rural planning, environment, safety etc.;
  - the effects of transparency created by electronic market places for transport efficiency and goods flows;
  - the developments and opportunities inherent to B2C fetch/bring systems;
- the points of intervention for government policy:
  - preferred goods and persons transport policy for B2C fetch/bring systems;
  - preferred innovation policy, including the stimulation of positive effects such as efficiency improvement;
  - preferred infrastructure policy.

There are currently still a number of studies underway that may provide relevant results on the basis of which further study and research protocol queries may be further refined.

#### Monitoring and statistics

The present set of tools for monitoring developments in e-commerce and Internet and their effects on logistics and transport transpires from the AVV study to be inadequate. The importance of adapting the statistical equipment to the changes in Dutch society and corporate life is therefore the first step in revealing and monitoring effects.

The importance of this is also subscribed to by other organizations such as the Ministry of Economic Affairs and the OECD. Any development of a monitoring system will require collaboration with the appropriate (international) organizations and compatibility with current initiatives. Study already conducted, including that for EA and the OECD, provides good starting points for the elaboration and setting up of a monitoring system. EA's project "Doing digital business: Construction drawing for an e-commerce monitor" expresses this in 22 conclusions – choices and recommendations. The report moreover makes the first approach for a list with indicators for an e-commerce monitor.



## Appendix 1:

Listing of some of the drivers, enablers and barriers in B2B e-commerce in 3 industries, on the basis of studied literature

Sectors	Automotive	Personal Computers	Logistics / transport
<b>Drivers</b>	<p><b>Producers:</b></p> <ul style="list-style-type: none"> <li>? potential for reduction of transaction costs by concentration and automation transactions (source on-line)</li> <li>? potential for reinforcement of purchasing power and utilization of extra advantages of scale by collective B2B exchange initiatives by several producers with suppliers (source on-line)</li> <li>? potential for offering extras to consumers who buy via Internet (sell on-line)</li> <li>? potential for improvement customer relations management and customer retention (sell on-line)</li> </ul> <p><b>Suppliers:</b></p> <ul style="list-style-type: none"> <li>? inventory reduction by improved adaptation of production by on-line real time insight into sales of automotive producer</li> </ul>	<p><b>producers:</b></p> <ul style="list-style-type: none"> <li>? potential for inventory reduction by real time insight into market demand and orders</li> <li>? negative working capital: first selling then buying from suppliers</li> <li>? potential for producing to order to customer specifications: postponing value adding activities</li> <li>? potential for improving market information: direct contact with the customer (sell on-line)</li> <li>? on-line real time insight for consumer into order status up to point of delivery</li> </ul> <p><b>Suppliers:</b></p> <ul style="list-style-type: none"> <li>? inventory reduction and production to order due to on-line real time insight into sales by PC-producers</li> </ul>	<p><b>Logistic service providers:</b></p> <ul style="list-style-type: none"> <li>? cost and flexibility benefits in supply chains. By developing e-commerce solutions for purchasing and logistics customers will be able to concentrate on B2C</li> <li>? high fuel prices, empty run percentages and intensive competition Eastern European carriers</li> <li>? improved operational logistic performance: tracking &amp; tracing orders and shipments – exchange of information and transactions</li> <li>? advantages of scale of freight exchanges and direct contact shippers - carriers: reduction of administration costs, improvement of efficiency by identification of reserve capacity of distribution operations, vehicles and warehouses, combining / matching of loads</li> </ul>
<b>Enablers</b>	<p><b>Producers:</b></p> <ul style="list-style-type: none"> <li>? extra marketing tool for actions directed to specific target groups in the market (sell on-line)</li> <li>? less intensive relation consumer - dealer due to lower required frequency of maintenance resulting from technical improvement to automobiles</li> <li>? buying dealers out</li> <li>? offering cost benefits to consumers</li> </ul>	<p><b>Producers:</b></p> <ul style="list-style-type: none"> <li>? limited channel power retail trade caused by fragmentation</li> <li>? elimination of middlemen by delivering direct to consumers via Internet and e-commerce</li> <li>? commodity "low touch" product character</li> <li>? know-how in software and Internet applications</li> </ul>	<p><b>Logistic service providers:</b></p> <ul style="list-style-type: none"> <li>? increased ease of contracting out for shippers due to Internet and e-commerce</li> <li>? growth potential due to large logistics service providers offering one-stop shopping</li> <li>? chain transparency as threat to traditional wholesalers and opportunity to service providers</li> </ul> <p><b>Wholesale trade:</b></p> <ul style="list-style-type: none"> <li>? deploying own B2B initiatives and added value activities</li> </ul> <p><b>Shippers:</b></p> <ul style="list-style-type: none"> <li>? on-line real time tracking &amp; tracing facilities</li> </ul>
<b>Barriers</b>	<p><b>Producers:</b></p> <ul style="list-style-type: none"> <li>? "high touch" character of an automobile to final consumer</li> <li>? suppliers threaten with their own e-market places</li> </ul> <p><b>Suppliers:</b></p> <ul style="list-style-type: none"> <li>? increasing resistance / disturbance among suppliers with respect to intentions of customers: establishment of own e-market places</li> <li>? limited number of 3PLs with the technical know-how for e-commerce and connection thereto</li> </ul>	<p><b>Producers:</b></p> <ul style="list-style-type: none"> <li>? resistance of customers from the business market to direct delivery: preference for after-sales service via traditional channels</li> </ul> <p><b>Business customers:</b></p> <ul style="list-style-type: none"> <li>? reduced after-sales service with direct delivery from producer</li> </ul>	<p><b>Logistic service providers:</b></p> <ul style="list-style-type: none"> <li>? Freight exchanges: risk of downward pressure on (transport) rates and commodities</li> <li>? Low margins in transport impede ICT investments by medium-sized businesses</li> </ul>





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