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# E-fulfillment and location decisions

An empirical study to show how E-commerce and E-fulfillment has changed  
location decisions.

Masterthesis Human Geography (GPM)

Specialization Economic Geography

Nijmegen School of Management

Radboud University Nijmegen

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## **Preface**

The master thesis that is lying in front of you is titled: 'E-fulfillment and location decisions'. This thesis signals the end to my study Human Geography at the Radboud University Nijmegen. I have completed this study, and this thesis, with great enthusiasm and passion. Location decisions have always been an important aspect of my academic interests, and a significant field of research in economic geography.

The topic of my thesis has changed during the process I went through this year. I have changed my topic to adapt to (possible) internships. This has resulted in two very different research proposals. This has been a time consuming process. However, in the end I can say that the research proposal, and thus, the research strategy, the theoretical- and methodological background to this research were at a higher level than the research practice. To me this means that this was time well spent.

The supervision and constructive critique of Pascal Beckers were important elements to the creation of this thesis. Therefore my first word of thanks goes out to him. I want to thank him especially for his role in generating the research strategy and conceptual model.

My second word of thanks goes out to the respondent of my interviews. Without them this research would be less meaningful. I want to thank them for taking time out of their busy schedules to answer my questions although this research did not benefit them in a straightforward manner, and these benefits were most likely not clear to them.

My third word of thanks goes out to the many experts that have offered their help and expertise for my research. In times where my motivation for this research was low, these people stated their interest in this research, this provided new motivation.

My last word of thanks goes out to you, reading this thesis, for taking the time to read this and showing your interest in my research.

Nijmegen, August 2013

Casper Engelen

## Summary

The logistics sector is an important part of the economy of the Netherlands. The sector contributes to the competitiveness of the country as well as the attractiveness of the business climate in the country. Therefore the logistics sector is named as one of the 9 sectors of particular interest by the government in the Netherlands. Many regional governments now have a more positive attitude towards the logistics sector and try to attract these companies through their policies. However, relatively little research has focused on finding the location factors that are most important to these types of companies. Little is known of what actually shapes the location decisions of these companies.

The ongoing development of E-commerce and E-fulfillment provides other opportunities to regional governments. Due to its labor intensive nature E-fulfillment can create many new jobs in a region. Additionally, even less scientific research has been conducted on the location factors that shape (re)location decisions in companies active in E-fulfillment.

The lack of scientific knowledge on the location factors that shape (re)location decisions in E-fulfillment companies is reflected in the aim of this research: *“To gain insights into the changes that arise in location preferences in (re)location decisions of (logistic) companies due to E-commerce, to anticipate on present and future location preferences.”*

Having this knowledge can help developing parties in developing locations that are attractive to these companies, and adapted to their requirements. This way the sector's growth can be facilitated.

In order to come to results matching the research aims, understanding of two very different, although somewhat related, theoretical backgrounds was necessary. First it was important to understand how location factors influence the (re)location decisions of companies. Therefore theories on location decisions were examined. This led to two categorizations of factors. The first was a categorization of primary, secondary and tertiary factors. Primary factors are factors such as labor costs and transport costs. Secondary factors are agglomeration benefits and proximity to sales markets, service providers and suppliers. Tertiary factors are a more diverse group of factors, spanning from government influences to the level of institutional thickness and the quality and the mentality of labor. In addition to this a distinction was made based on the nature of the factors. This distinction has led to the second categorization of aspects to location decisions; Firm external, Firm internal and location factors. Firm external factors are those factors that are characteristic of a certain area or region, these factors include to size of labor and sales markets and government regulations. Firm internal factors are the characteristics of the company that shape their location decision, for instance the life phase and the size of a company. Location factors are those factors that are truly location specific, such as the distance to sales and labor markets and the characteristics of the properties.

Furthermore, it was necessary to understand how logistic supply chains are organized and how E-commerce has affected these supply chains. This was the second theoretical background mentioned above. A supply chain shows how the products are moved from one party to the other and where individual companies receive their products from and send their products towards. These supply chains are however, complex networks that cannot be illustrated easily. There are different forms of E-commerce; Business-to-consumer (B2C), Business-to-business (B2B) and Consumer-to-consumer (C2C). This research focuses on B2C E-fulfillment, because previous research indicates that

differences in location factors are more likely in this kind of E-commerce. In addition to the different forms of E-commerce there are also four different types of supply chains. The way these supply chains are organized shapes the location decisions of the companies that are involved.

The first type is the single channel retailer; this retailer receives its products from wholesalers or producers and sends the products directly from its distribution center to their customers. The second type is the multi-channel retailer; this retailer also receives its products from wholesalers or producers, however, it does not only send its products directly to their customers, but also to their stores. They do this by either having multiple distribution centers or combining both flows in one location. The third type is the direct supply chain, where the producer has its own web-shop and distribution center and delivers the good without interference of a retailer. The fourth type is the virtual supply chain, where the retailer only functions as an intermediary, this means that the products are not physically present at the locations of the web-shop but are delivered directly to the customers.

The hypothesis of this research was that: E-commerce has influenced (re)location decisions made in logistic companies through changing the preferences in firm external- and location factors.

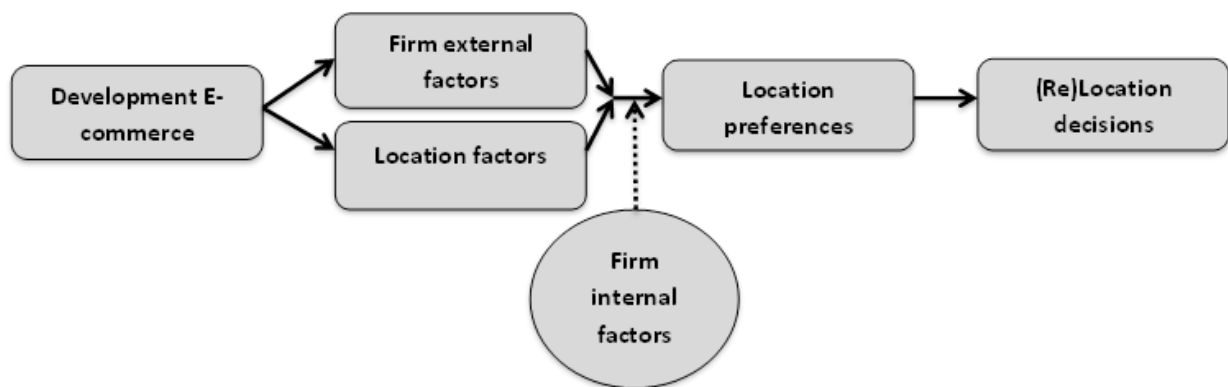


Figure 1: Conceptual model

Firm internal factors influence these changes. In addition to this, the way the distribution network is organized also directs the changes that occur due to E-commerce. The way return shipments of goods are handled will also play a role in the physical distribution networks and therefore in the location preferences and the way (re)location decisions are made. Further it is argued that different sub-sectors related to E-commerce have different location needs and –preferences, which are created by firm internal factors.

In order to be able to compare the different types of companies with each other, the factors that were mentioned by the respondents were categorized into different types: Primary, secondary and tertiary. In addition to this they were categorized by nature: Firm-external, 'location' (as in location or building specific) and firm-internal.

Because relatively little empirical research has been conducted on the research subject the choice was made for a qualitative research method. This resulted in a research strategy aimed at interviewing companies in the field of E-fulfillment and revealing new insights by exploring their motivations. Of the qualitative methods that could be used, Grounded Theory was most fit to answer

the research question and achieve the aims of this research. The research material that was analyzed using Grounded Theory were; Interviews with people from companies in the field of E-fulfillment, expert interviews and field notes (taken around the interviews and from expert meetings). Additionally, literature was used to answer the questions of this research. The interviews that were conducted were semi-structured, this means that some questions were pre-determined, however, due to the exploratory nature of this research, the choice was initially made to have as few questions pre-determined as possible. After some less successful interviews this strategy was adapted because the respondents moved to far away from the questions in their answers.

The research has shown that the most important location factors during the phase before the development of E-commerce were: Primary 'location' factors (3), Tertiary firm-external factors (2) and one other 'location' factor. This particularly reveals their focus on primary factors and 'location' factors. The companies that are active in the field of E-fulfillment prioritize other factors than the more traditional logistic companies. Tertiary firm-external factors (12) and other 'location' factors (13) are most important to companies inside the field of E-fulfillment. Additionally, it was shown that secondary factors have become more important due to the greater need for speed and flexibility inside the supply chain. Firm-external factors have become more important due to the higher importance of labor markets, direct availability of plots or buildings and the greater importance of outbound flows.

Additionally, this research has shown that logistic service providers regard similar factors important as the more traditional logistic companies. This is in contrast to the factors that were deemed important by E-tailers that were examined. In the group of E-tailers tertiary factors and firm-external factors were more important, whereas in the other two groups primary and location specific factors were more important. However, both the E-tailers and the logistic service providers prioritize location specific factors that could not be categorized as primary, secondary or tertiary. This perhaps means that building specific factors have gained importance.

Furthermore, there are also differences between the E-tailers that were examined. These differences can mostly be explained through differences in the characteristics of their products and their customers. The differences between the companies were big enough to indicate possible structural differences between the different sub-sectors; however, the research design did not allow examining this in a broader way.

There are three developments going on in the field of E-fulfillment. The first is internationalization. This could mean that the amount of factors that are being assessed will rise in the future. The second development is the automation processes that are likely to occur. These will reduce the importance of labor market factors, however, these will likely still be more important than in traditional logistics. The last development is the higher amount of products shipped directly from the producers, this will only change the location factors of the producers, making their sales markets more important to them.

The changes that have arisen in the (re)location decisions and preferences of the companies in the logistics sector coming from the ongoing development of E-commerce cannot be explained in a straightforward manner. There are many differences between the companies active in the field of E-fulfillment, and the sector is still young and very diffuse. However, it is clear that the E-tailers that were examined generally look at other factors than the logistics service providers and traditional



logistic companies. However, Secondary location factors have gained importance. This is mainly due to the need for greater flexibility that is brought about by the change in customers they have. Traditional logistics has generally been business to business oriented; these customers generally allow a longer delivery time. The focus on consumers brought about by E-commerce has shortened the delivery times; and therefore increased the importance of flexibility. Additionally, the higher amount of single orders and packaging that has come out of the development of E-commerce has created Value Added Logistics and Value Added Services; therefore companies that are active in E-fulfillment have more labor intensive processes.

Although this research has generated some interesting results in regard to the changes in location factors and the differences in sub-sectors, it is important to note some of the debatable aspects of this research. First of all, the internal validity of the information that was gathered cannot be proven. It remains unsure whether the respondents have truly answered the questions correctly and exhaustively. This is however, a general problem when conducting interviews, it was attempted to combat this by cross-checking with multiple sources. Additionally, the interviewing and data analysis should have been conducted more profoundly and thoroughly. Moreover, the classifications used in this research are oversimplifying the specificities of the factors described. And the comparison of traditional logistic companies with companies in the field of E-fulfillment is questionable due to the different origins and nature of the data that was used.

Future research could examine to what extent the differences between the sub-sectors that were described in this research are structural. This research could focus on quantitatively establishing the prevalence of these differences. This research has provided multiple grasping points for future research. Possible areas of focus are: the role of characteristics of the products, the role of the position within the supply chain and other forms of E-commerce (B2B & C2C).

# 1 Introduction

## 1.1 Introduction

The logistic sector contributes a substantial share to the Dutch economy and The Netherlands has an international top position when looking at the logistic sector (Topteam logistiek, 2011). Furthermore, the logistic sector contributes to strengthening the competitiveness on the international level and the attractiveness of the business climate (Topteam logistiek, 2011). Partly for this reason the logistic sector is pointed out as one of the nine top sectors, in the 'Topsectoren'-policies of the Dutch national government (Rijksoverheid, 2013). In these policies the government wants to facilitate and direct the growth of this sector in several ways, mostly by creating innovative networks in the sector however, also by new laws and policies surrounding locations. Additionally, the logistic sector is a sector of growth that demands a lot of space and due to the developments in the sector and the amount of fusions and takeovers there is a continuous demand for relocation.

Regional governments can play a role in attracting logistic firms. Some municipalities and regions have an internal urge to trying to become a logistic 'hotspot' (Regio Rivierenland, 2012). Many municipalities give the logistic sector an important role in their policy (Logistiek.nl, 2013). Governments can create policies that make them more attractive to logistic companies, for example in restrictions and permits surrounding the build environment (Topteam logistiek, 2011). However, relatively little empirical scientific research has been conducted on the location decisions of transport and logistics companies (Eurofound, 2008). Thus, in science there is a knowledge gap on location preferences and location decisions in logistic companies. However, knowledge on this matter is widely available in professionals surrounding logistic sector.

Generally speaking it can be argued that a strategic position as well as access to different transport modalities is important for these types of companies. However, a number of other factors are also important. Amongst these are for instance the building regulations and the possibility for developing new buildings (Logistiek.nl, 2013b). Therefore it can be said that government policies create the preconditions for the location decisions of logistic companies. In addition to this a trend is visible for more durable buildings, complying with the norms of the BREEAM certification mark (Logistiek.nl, 2013c). This certification mark reviews the sustainability of the buildings (BREEAM-NL, 2013).

Furthermore, the logistic sector is a dynamic sector that develops continuously (Rushton et al., 2000). One of these developments is the rise of E-commerce and E-fulfillment. Despite the technological nature of this kind of trade through these internet transactions, these transactions still require the delivery of goods through physical distribution networks (Rushton et al., 2000). However, this kind of distribution requires a different form of distribution networks, which has effects on location decisions made by companies in this sector (Agatz et al., 2008; Castelein, 2012; Lau et al., 2010; Rushton et al., 2000). Nevertheless there has not been much empirical research on this matter. E-commerce has changed the way logistical supply chains have been constructed and has also made logistic services more differentiated and more complex (Castelein, 2012). Or as Rushton et al. (2000) put it:

*“Very often this (E-fulfillment) may even necessitate the introduction of a new means of physical distribution, because traditional channels are set up to distribute to shops rather than direct to the home.”*

Although E-commerce can also harm economic development, as argued by Nakayama (2009), this effect arises mainly when E-commerce’s market share is low and its costs are high. Therefore it is important to create the preconditions that allow the E-commerce and E-fulfillment sector to develop. Additionally, the amount of transactions made through E-commerce is growing and will continue to grow for some time. Therefore it is important that future business areas and logistical- and distribution networks are set up in a way that accommodates this development. As a result, research has to be done to reveal how this can be accommodated by developing parties.

## 1.2 Relevance

In order to clearly show the relevance of this research a distinction has to be made between academic and societal relevance. Therefore both forms of relevance will be argued below. First the scientific relevance will be discussed; this will reveal what this research contributes to scientific knowledge in this field. Secondly, the societal relevance will be discussed; this will reveal what this research contributes to society in general.

### 1.2.1 Academic relevance

The academic relevance of this thesis lies in the fact that not much empirical scientific research is conducted on location preferences of logistics companies. This also means that the effect E-commerce has on (re)location preferences and decisions is relatively unknown. In contrast to this, there has been much theoretical research on optimizing supply chains and logistics networks, also in relation to E-commerce (Agatz et al., 2008). Most research focuses on supply chain management and the design of distribution networks (Klose & Drexl, 2005; Lau et al., 2010; Manzini & Gebennini, 2006; Melo et al., 2009). This research focuses on the companies and their preferences. By focusing on the companies and their preferences the gap in the knowledge of location decisions of logistic companies, as recognized by Eurofound (2008), can be reduced.

### 1.2.2 Societal relevance

This research has societal relevance because it can help developing parties to create the conditions that logistic companies need to be able to select the most optimal positions for their activities. This has potential economic benefits as well as benefits for consumers. Therefore it is important to create the preconditions that allow the E-commerce and E-fulfillment sector to develop. Additionally, E-commerce and E-fulfillment related logistic activities are more labor intensive than other forms of logistics activities, due to Value Added Services and Value Added Logistics. This means that by contributing to the knowledge on location preferences and providing insights into the requirements of attracting these firms can help attract jobs to a region.

### 1.3 Research aim

The aim for this research is:

*“To gain insights into the changes that arise in location preferences in (re)location decisions of (logistic) companies due to E-commerce, to anticipate on present and future location preferences.”*

In this respect it is important to research which aspects of a certain place make it attractive for logistic companies, as well as how (more) attractive locations can be made. It is also vital to research how location preferences have changed, and are likely to change in the future due to the ongoing development of E-commerce and E-fulfillment. In short, the research is aimed at examining the preferences of logistic companies and the extent to which the policy surrounding and the development of business areas matches those preferences. This will lead to recommendations for all parties involved in developing business areas.

It is important to note that the target group this research aims for are the parties involved in the development of business areas and -lots for logistic companies. It is important to distinguish between these parties. One group of parties are the governmental parties such as local, regional, and national government. Another group of parties are the real estate developers, who tend to have close contact with the companies they develop for. It is also important to look at the roles of the parties involved; this will be done more extensively in chapter 2.

### 1.4 Research questions

Main question:

What changes have arisen out of the ongoing development of E-commerce and E-fulfillment in the (re)location decisions and preferences of companies in the logistics sector?

Sub questions:

- Which location preferences were important for logistic companies prior to the development of E-commerce?
- Which location preferences have become (more, or less) important due to the rise of E-commerce?
- What are the differences between different sub-sectors in E-commerce?
- What does this development mean for future location decisions and –preferences?

### 1.5 Outline

This chapter has shown what has been researched and why it has been researched. The next chapter (Chapter 2) shows the theoretical framework of this research. The first paragraph (Paragraph 2.1) explains theories on location decisions in general. Paragraph 2.2 then describes the categories of factors that are distinguished in the literature on this subject. The third paragraph (Paragraph 2.3) shows the theoretical knowledge on logistics that was necessary to conduct this research. The

following paragraph (Paragraph 2.4) describes the E-commerce supply chain and its impact on location decisions. Paragraph 2.5 reveals the conceptual model and hypothesis of this research. Paragraph 2.6 briefly discusses the theoretical knowledge that was used in this research.

Chapter 3 shows the methodological framework of this research. This chapter first describes the research strategy that was utilized (Paragraph 3.1). Afterwards, the research material is described (Paragraph 3.2). Following this the manner in which the respondents were selected is explained and discussed (Paragraph 3.3). Paragraph 3.4 reveals how the interviews were set up. The methodology is discussed in Paragraph 3.5.

The following chapter shows the results of this research. The first paragraph describes the information that was gathered during the interviews with respondents from the companies (Paragraph 4.1). The second paragraph describes the results of the interviews with expert (Paragraph 4.2). The third paragraph of this chapter shows field notes that were taken during the research process. Paragraph 4.4 shows the results of this research and connects the information that was gathered with the research questions.

Chapter 5 reveals the conclusions of this research (Paragraph 5.1). Afterwards the conclusions and the research itself are discussed (Paragraph 5.2). Following this, recommendations for future research are explained (Paragraph 5.3).

## 2 Theoretical Framework

This chapter will reflect the main theoretical insights surrounding location decisions. The first two paragraphs will describe the theoretical framework in relation to location decisions (Paragraph 2.1 and Paragraph 2.2). Paragraph 2.1 will firstly summarize the theories on firm (re)location decisions. Following this, in paragraph 2.2 the different categories of factors influencing the location decisions will be elaborated. This will be done by describing three sorts of factors; firm external factors (paragraph 2.2.1), location factors (paragraph 2.2.2) and firm internal factors (paragraph 2.2.3).

The following paragraphs (Paragraph 2.3-Paragraph 2.5) will show the theoretical framework of logistics and E-commerce and E-fulfillment). Paragraph 2.3 will give insight into logistics networks and supply chains. Paragraph 2.4 will reveal the way E-commerce has changed the logistics sector and explain how these changes affect their location decisions. Paragraph 2.5 will show the conceptual models that shape this research; this will also show the hypothesis of this research (paragraph 2.5.1). Both conceptual models will be explained thoroughly. Paragraph 2.6 discusses the theoretical framework.

### 2.1 Location decisions

Research on location preferences of companies can be useful to develop business parks and industrial zones. Different strands of research focus on different elements of the location decision. A lot of institutional and evolutionary approaches try to show the need for successful embeddedness into the area (Pellenbarg, 2006). Other, more neo-classical theories focus on the transportation and employment costs. This has led to a wide array of results in scientific research. The results varied between different researches mainly because of the characteristics of the surveyed companies and the characteristics of the research. In addition to this the researcher often unconsciously sends his respondents into a certain direction. However, there are still results visible in research of location preferences that follow older and newer theories of location decisions (Pellenbarg, 2006).

Pellenbarg (2006) states that roughly hundred years ago the location choices in countries like the Netherlands revolved around 'hard' factors like transport- and employment costs. A tradition that was influential until mid-twentieth century. Afterwards the differences in the Netherlands became smaller, because the transportation costs were lower due to the mass scale construction of infrastructure and the differences in regional employment costs were lower due to the growing labor mobility (Pellenbarg, 2006). After this phase agglomeration benefits became more important in theories of location decisions. At the turn of the twentieth century the emphasis was put on, previously perceived as trivial, 'soft' factors such as institutions, knowledge, environment, mentality and image of the area (Pellenbarg, 2006). This tradition did not only look at the facts, instead the beliefs and perceptions of the entrepreneurs also played an important role, just as the embeddedness in economic and social networks. The behavioral and institutional strands in theories on businesses and their environments fit good to these kinds of factors (Pellenbarg, 2006). Figure 1 summarizes the trends described above.

Table 1: Changes in location decisions. Source (translated and edited): Pellenbarg, 2006, p.2.

	Phase 1: Industrial Revolution	Phase 2: After 1950	Phase 3: 2000 onwards
Type of factor	Primary factors	Secondary factors	Tertiary factors
Factors:	Transport costs	Proximity to sales markets	Government influences on location decisions
	Labor costs	Proximity to suppliers and service providers	Level of 'Institutional Thickness'
		Miscellaneous agglomeration benefits	Knowledge centers and ICT-infrastructure
			Quality and mentality of labor
			Environmental aspects
			Representativeness of locations
			Quality of living- and recreational environment
			Etcetera.
Type of theory	Neo-classical location theory	Growth poles theory Cumulative causation theory	Behavioral and institutional theories
Pattern	Regional concentration	Urban agglomeration	Spatial diffusion

All these factors can have a different effect on the (re)location decision of companies. The way these factors influence the decision can be roughly divided into three categories based on their effects. The three effects that can be ascribed to the factors are: Push-, Pull- and Keep effects (Pellenbarg, et al., 2002; Sleutjes & Beckers, 2012). This makes it possible to recognize push-, pull- and keep factors. Push factors are factors that are negative for a firm, and that direct a company towards migration. They push a company out of the existing location. Pull factors are positive factors that move a company to settle or locate in a certain area, they are perceived to pull a company into a certain area. Keep factors are positive aspects that steer a company towards staying in the area in which it is already located, they keep the company where it is (Pellenbarg, et al., 2002; Risselada & Schutjens, 2012; Sleutjes & Beckers, 2012).

This classification of factors is important for this research because it provides certain insights that make it possible to examine the role and the effects that different factors can have on firm location behavior. It is also important to note that the push-, pull- and keep factors of a location or area should be seen relatively (Risselada & Schutjens, 2012), this means that the factors and their effects depend on both the characteristics of the firm and the characteristics of other regions as well. For example: If the quality of an area decreases, due to criminal activity it can become relatively less attractive in comparison to other areas. This can change the effect the quality of the area has from a keep effect to a push effect. In addition to this the quality of the area can become a pull factor for another area.

In addition to this, the literature often distinguishes between different forms of (re)location decisions: Complete and partial relocation (Brouwer et al., 2004). Complete relocation means that a business moves completely from one place to the other. Partial relocation is when businesses spread their activity through space in order to take advantage of the most favorable locations (Brouwer et al., 2004). This research will use the term (re)location decision to describe both types. In addition

this research is not limited to one of these types, as both can be caused by the development of E-commerce.

## 2.2 Categories of factors

The literature on firm (re)location behavior also distinguishes based on the nature of the factors. This means that the factors are subdivided into the categories 'firm internal', 'firm external' and 'locational' factors (Van Dijk & Pellenbarg, 2000, in Hu et al., 2008 p. 68; Risselada & Schutjens, 2012; Sleutjes & Beckers, 2012). The importance that is ascribed to the different categories of factors varies strongly in different researches (Hu et al., 2008). Research by Schmenner (1980, in Hu et al., 2008 p. 69) and Mariotti (2005, in Hu et al., 2008 p. 69) showed that internal factors are most likely to be strong determinants in firm (re)location behavior. However, other research has shown that external factors can be at least just as important (Hu et al., 2008). The distinction between these categories of factors can be used to create (and differentiate) policy recommendations for the different actors involved in developing business areas and property for the firms involved.

### 2.2.1 *'Firm external' factors*

This category contains inter alia government policies and the regional economic infrastructure (Hu et al., 2008). Or, as Sleutjes & Beckers describe it; the production environment (2012, p. 4). This also encloses important aspects such as the institutional network. In addition to this, factors like the supply of suitable property, the incomes of citizens and the livability of an area belong to this category (Sleutjes & Beckers, 2012). Environmental aspects and agglomeration benefits and for instance the size of (sales) markets can also be found in this category.

### 2.2.2 *'Location' factors*

In this category the factors that are truly location specific are enclosed (Hu et al., 2008). Examples are the distances to markets and suppliers and other distances. In addition to this the characteristics of the building and the grounds play an important role. To some extent the location factors are part of the firm external factors, they are however, more specifically aimed at the characteristics of the location.

### 2.2.3 *'Firm internal' factors*

In addition to the characteristics of the location and the perceptions of people, the characteristics of the company also play an important role in firm (re)location behavior. An attribute such as the life phase of a company has influence on the (re)location decision. Starting companies tend to move more often than older companies, because older companies are more likely to be grown to their maximum, therefore these companies are not looking to expand (Garnsey, 1998). The size of the company also has some effect on a possible (re)location decision; this is because 'sunk costs', the



costs of severing the embeddedness in an area, are higher for bigger firms (Stam, 2003). In addition to this, some research shows that smaller companies mostly relocate inside the region, whereas bigger firms move over greater distances (RPB, 2007 in Sleutjes & Beckers, 2012, p.4). The organizational structure also influences the way (re)location decisions are made and the choices and considerations (Hu et al., 2008). These factors are going to help in creating a nuanced picture of the differences between companies.

## 2.3 Logistics

Logistics according to Rushton et al. (2000, p.4) comprises of supply, materials management and distribution. Additionally, logistics is concerned with the physical and informational flow from raw material through to the final distribution of the end product (Rushton et al., 2000). The basic logistical network consists of a supply chain (Manzini, 2009; Rushton et al., 2000). This supply chain can be shown schematically as follows:

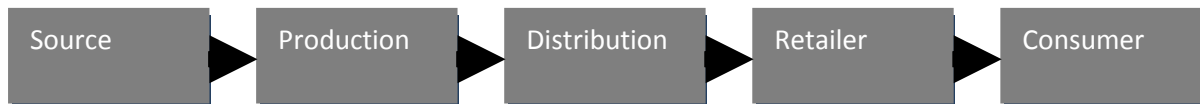


Figure 2: Basic supply chain

This figure shows the different locations the physical flow of goods passes. The arrows between the locations are the moments where transport is conducted. The first step is where the raw materials are moved from the sources to their production locations. After being produced the products are moved to distribution locations. From these locations they are distributed to retailers, from where they are sold and transported to the consumers. Traditionally, the size of the stocks and the size of the shipments become smaller throughout this supply chain (Castelein, 2012). However, the supply chain as shown in figure 2 is a rigorous oversimplification. Most supply chains are actually complex supply chain networks (Manzini, 2012). In addition to this the basic supply chain shown above suggests a linear process, whereas in reality this is not the case. Figure 2 (below) shows the elements of the logistical process as well as the importance of material and informational flows. There are numerous elements within logistical systems that determine the way the system functions and all have different demands for the location where they take place. However, this figure does not reflect the complexity of supply chain networks, where there are often many different distribution centers, production centers and consumers that are all tied to each other in different ways (Manzini, 2012). In addition the process is also made more complex because most retailer and distributors handle different sorts of goods and products.

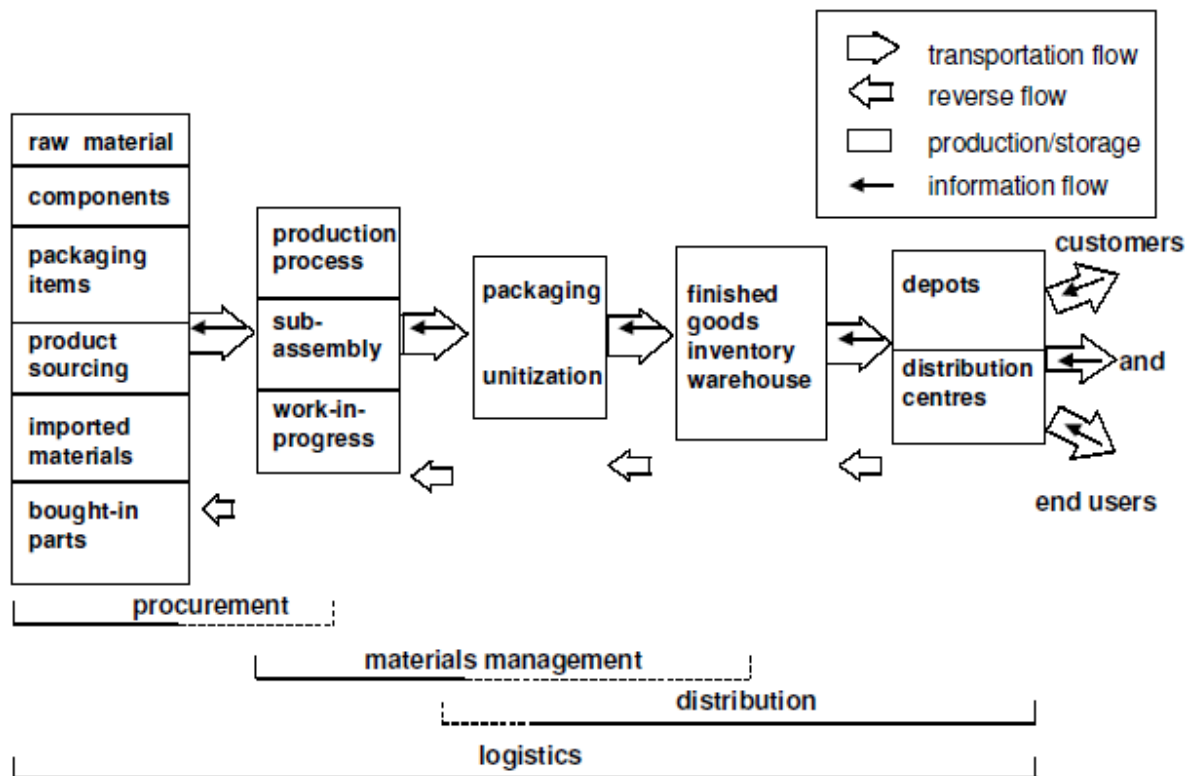


Figure 3: Key components logistics. Source: Rushton et al. 2000, p. 5.

As both figures (2 and 3) show the field of research extends from the source (of raw materials) to the end users and consumers. This process is called distribution logistics. Therefore it is necessary to explain distribution logistics further. In addition E-commerce has mainly affected distribution logistics (Castelein, 2012). Distribution logistics comprises of the balancing of three subsystems (van Goor & Ploos van Amstel, 2009); stock supplies of products, internal processes that distribute goods to certain costumers and external transport.

Van Goor & Ploos van Amstel (2009) make a distinction between three forms of distribution:

- Direct distribution, when delivery is made directly from the producer to the end user or customer.
- Indirect distribution, where there are many links and warehouses in the supply chain.
- Affiliate distribution, a form of indirect distribution where the delivery to the end user or customer is made through the location of an affiliate. This means that for instance a retailer takes care of the last part of the distribution and takes over part of the warehousing.

This distinction shows the way in which distribution networks are generally organized, all three forms have different implications for spatial distribution and location needs of the businesses involved. Therefore all three kinds of distribution are interesting for this research. However, it remains important to differentiate between the different forms of distribution organizations, in order to be able to give nuanced conclusions.

## 2.4 E-commerce

This paragraph explains the way E-commerce has changed logistical/distribution networks.

In this research E-commerce and E-fulfillment are used side by side although both concepts do not describe the same phenomenon. E-commerce covers all aspects of transactions via the internet, whereas E-fulfillment only covers the aspects after the consumer has ordered a product online. This means that E-fulfillment contains the processes and actions that ensure that the products that were ordered are delivered to the customers (Agatz, 2008). Since this research focuses on the logistic activities of companies in the E-commerce sector these terms are interchangeable in most parts of this research.

It is also important to explain what is meant with E-commerce, in this research E-commerce is understood as all transactions that have been conducted over the internet. Typically the literature distinguishes between 3 forms of E-commerce (Castelein, 2012; Lau et al., 2010; Rushton et al., 2000):

- Business to business (B2B), where trade takes place between two companies;
- Business to consumer (B2C), where trade occurs between companies and consumers;
- Consumer to consumer (C2C), where trade occurs between consumers.

The results of E-commerce on (re)location behavior and location preference can be seen best in business to consumer (B2C) activities (Castelein, 2012). Therefore these types of activities will play a central role in this research. This also means that the findings of this research focus on B2C companies. Within this broader scope it is important to explain the B2C process more in depth.

### 2.4.1 E-commerce supply chains

There are 4 types of supply chains inside the B2C category (Figure 4). One of these types is the multi-channel retailer, another is the single channel retailer (Agatz et al., 2008). The single channel companies make use of only one form of sales and distribution, either from physical stores or through the internet. In this research, the single channel retailers are those that only offer their goods through the internet, since E-commerce has affected them more. The multi-channel retailer uses a combination of both means. It can do so in 2 ways, by combining the internet distribution with the distribution networks of physical stores, or create a distribution network specifically for internet sales (Castelein, 2012).

In addition to this, there are direct forms and virtual forms of E-commerce. Direct means that the producer of the goods directly sells and distributes the goods without interference of a retailer. Virtual (or longtail) is when the web shop only functions as an intermediary of the online transactions, and the distribution is handled by the producer/distributor (Castelein, 2012). Figure 3 shows the way the different kinds of organization realize their distribution networks. The way these supply chains are organized has some impact on location needs, and thus preferences. Distribution is also outsourced to logistic service providers often, which are seen as a sub-sector of E-commerce in this research, since they often serve multiple retailers.

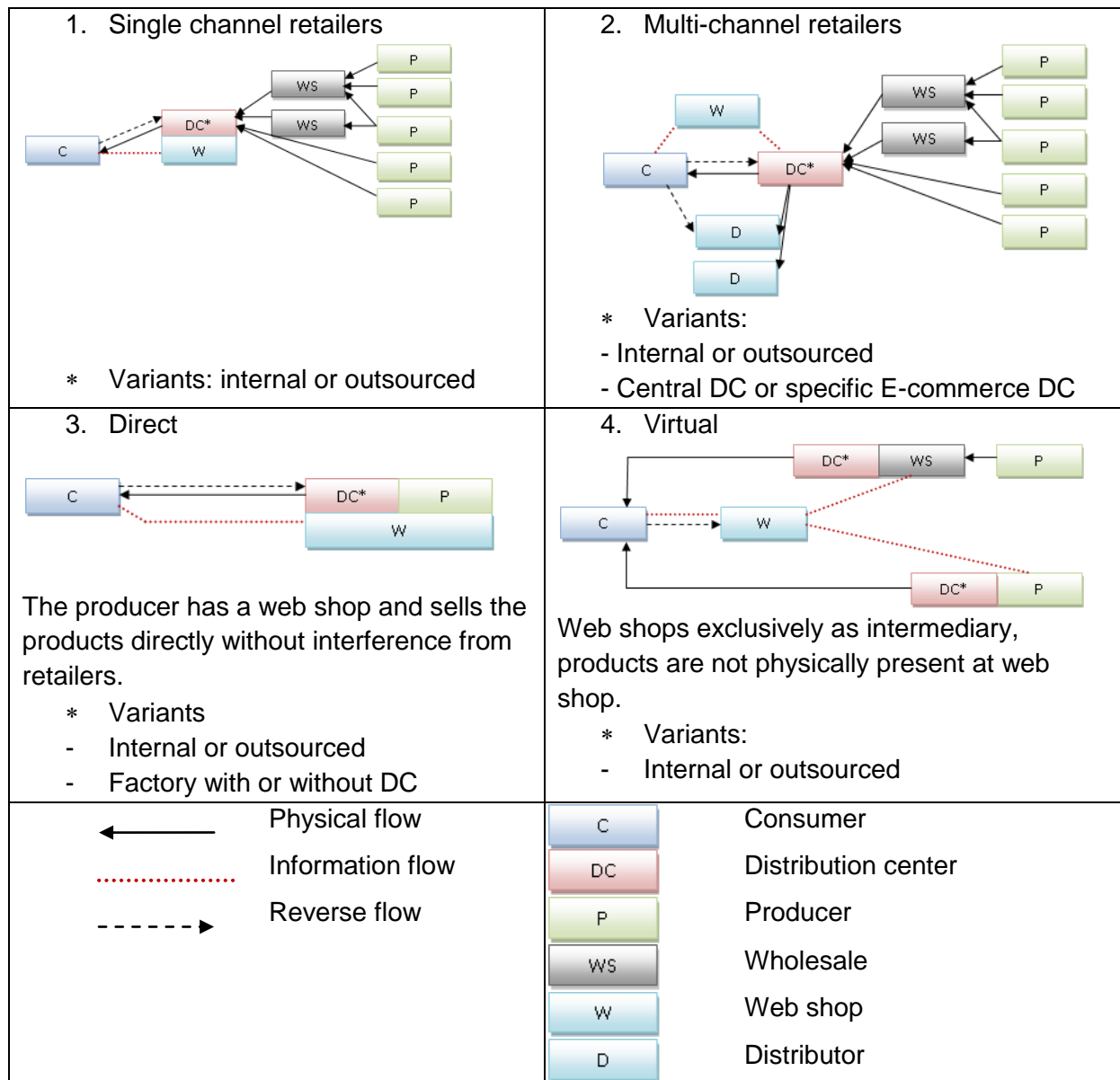


Figure 4: Supply chains E-commerce. Source (edited): Castelein, 2012, p. 21.

This division is relevant to show the different kind of location needs that could arise in the different sub-sectors that are examined in this research. Both the location of stock supplies and the processing of orders take place at other places in the supply chain (van Goor & Ploos van Amstel, 2009). Additionally, because of the smaller amount of stock supplies other forms of warehousing are required (Castelein, 2012). Additionally, this figure reveals the importance of the position inside the supply chain. The difference in position inside the supply chain could also provide differences in location preferences. Therefore this research aims to examine companies in different positions in the supply chain.

#### *2.4.2 Forms of E-fulfillment*

An important element in the B2C distribution network is the final delivery to the customer. The delivery to the customer is often a cost-intensive process. Delivering the goods to the customer's (home) address is known as 'the last mile' (Agatz, 2008). Due to the high costs of delivering at home, other forms of distribution have been developed. Van Goor & Ploos van Amstel (2009) states that there are 3 forms of delivery to the consumer recognizable:

1. Delivery to an already existing physical store.
2. Delivery through a (possibly third party) pick up point (PUP).
3. Delivery to an address selected by the customer.

The use of these forms shapes the location needs of the companies involved, because the organization of the distribution network determines the locations of warehouses and distribution centers. Therefore a distinction will be made between companies based on these forms.

#### *2.4.3 E-fulfillment and location preferences*

Castelein (2012) has shown that E-commerce has changed the needs and preferences of logistical companies in real estate terms. He has done so by examining both building specific, quantitative and qualitative requirements as well as location factors. Castelein's (2012) findings in regards to location were that E-commerce related distribution centers need proximity to parcel distribution centers and sufficient and flexible labor pools. These labor pools were needed to be able to cope with temporary peaks in sales. Additionally, access to public transport was needed, and centers should be near sales markets. These conclusions were however, not differentiated over different sub-sectors in E-commerce (Castelein, 2012). In addition these conclusions were not specific, like for instance the sales market, which was seen as the national market. In the case of location decisions for PUP's using the national market cannot provide a sufficient explanation, since sales markets are more local for PUP's.

Furthermore, Castelein (2012) has shown changes in location factors such as a greater need for office space in E-fulfillment centers, smaller units, more parking spaces and better circumstances for the employees. These changes were also not differentiated amongst the different sub-sectors of E-commerce related companies.

### **2.5 Conceptual model**

This research examines how the development of E-commerce has influenced the location preferences of logistic companies. Therefore the conceptual model looks as follows (figure 5).

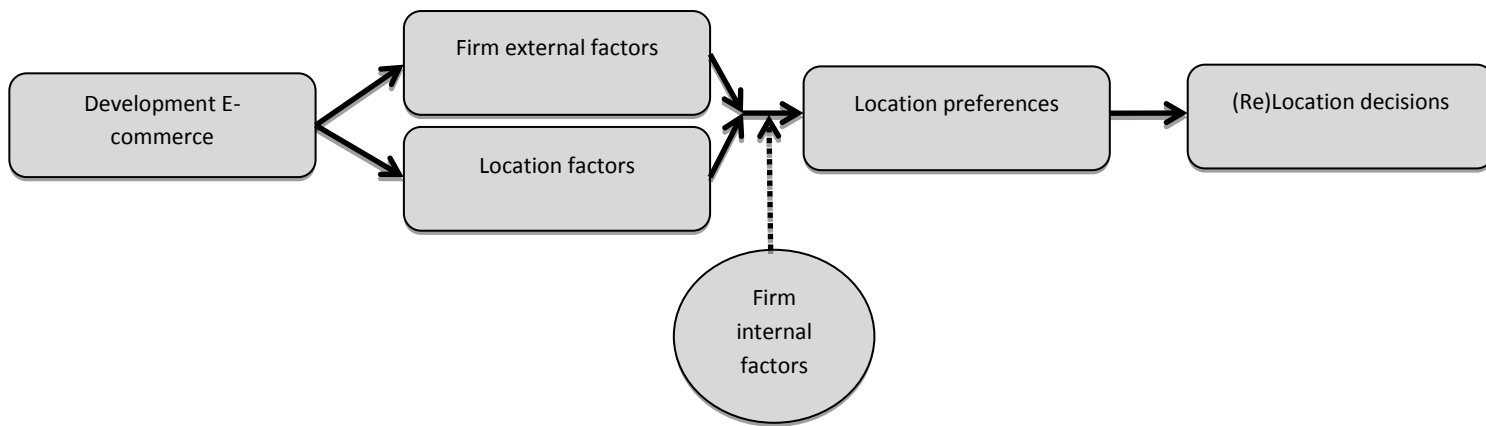


Figure 5: Conceptual model

This figure shows that the way E-commerce has influenced location preferences and thus (re)location decisions is twofold. On the one hand firm external factors have been changed through the changes in for instance consumer behavior and the organization of the distribution network. This is reflected by the arrow from the box development E-commerce to the box Firm external factors. Additionally, location factors were influenced by the development of E-commerce, for example, the required size of buildings, and their distance to consumers and other locations (in the supply chains). This is reflected in the figure above by the arrow between the boxes Development E-commerce and location factors. Both types of factors influence the location preferences of the companies that are involved in E-commerce and E-fulfillment activities, this is reflected by the arrows from the boxes Firm external factors and location factors to location preferences. The location preferences shape the (re)location decisions, this is shown by the arrow between these two boxes. Firm internal factors are not changed by the development of E-commerce, however, they do influence the location preferences of the companies involved. They do so by influencing Firm external and location factors. Firm internal factors shape the influence the firm external factors and location factors have on location preferences. For example, the characteristics of their products shape the importance and/or effect that changes in consumer behavior have on location preferences. This means that for example the effect that customer demand for faster delivery leads to closer proximity to customers; however, this effect is greater in some types of products than in others.

### 2.5.1 Hypotheses

The hypotheses in this study is that E-commerce has influenced (re)location decisions made in logistic companies through changing the preferences in firm external- and location factors. Firm internal factors influence these changes; this creates the difference between the sub-sectors. In addition to this, the way the distribution network is organized also directs the changes that occur due to E-commerce. The way return shipments of goods are handled will also play a role in the physical distribution networks and therefore in the location preferences and the way (re)location decisions are made. Further it is argued that different sub-sectors related to E-commerce have different location needs and -preferences.

## 2.6 Discussion of theoretical framework

Although it would have been possible to discuss the supply chains of E-commerce logistics and the differences between different forms more in-depth this knowledge will only be used to provide some grasping points on the differences between companies and sub-sectors. Additionally, the same can be argued for the organization of distribution networks, more information on this subject could also be included, but the choice was made to keep these parts concise because more explanations on these subjects were not necessary to be able to answer the research questions. However, during the research some sensibility to both these aspects of the companies that were interviewed remained. All companies were asked to describe their supply chain and distribution networks in order to distinguish on these subjects.

### 3 Methodological framework

This chapter aims at revealing the main methodological background of the research. Firstly paragraph 3.1 will explain the choice of the research methodology, by looking at the research objectives and the theories surrounding the research questions. The first sub paragraph of paragraph 3.1 will then consider different qualitative methods and select one (3.1.1). The second sub paragraph (3.1.2) will reveal the method that is used in this thesis, expert interviews. The third sub paragraph (3.1.3) will reflect on the consequences the choice of methodology has on this research. The second paragraph (3.2) will reveal the research material of this thesis. Paragraph 3.3 will explain how respondents were selected and give a detailed description on why these were selected. In paragraph 3.4 the theoretical background of the interviews will be explained, this means that the way they are structured and which questions are asked and why will be elaborated thoroughly. Sub paragraph 3.4.1 will then show the interview guides. Paragraph 3.5 reveals the way the qualitative data is analyzed.

#### 3.1 Research strategy

As shown in earlier paragraphs the field of research that is examined in this research has not been researched much empirically. Therefore the choice of in depth research is more logical than a choice for broader research (Creswell, 2007). Depth in researches is mostly created through qualitative methods, width mostly through the use of quantitative methods (Vennix, 2007). Therefore this research focuses on a qualitative research method. Qualitative methods allows researchers to gain more knowledge on questions of why and how, in contrast to quantitative methods which focus more on questions of how much and how often. Additionally, qualitative methods enable the discovery of new insights into the central issue, whereas quantitative research aims at providing proof. Furthermore, the use of qualitative methods provides a more holistic approach, studies motivations and has a more open and exploratory perspective (Creswell, 2007; Barbour, 2008). These characteristics fit the goals of this research, because it allowed for a more open perspective on gaining insight into the factors that shape (re)location decisions.

In comparison to other forms of qualitative research, Grounded Theory is most capable of providing answers to the research questions in this research. The theories described in the theoretical framework do have not been researched empirically in companies affected by E-commerce; therefore they might not describe this group completely. Therefore Grounded Theory is a logical approach for conducting this research (Creswell, 2007). Or, as Bryantz and Charmaz describe it:

*“Grounded Theory is an excellent tool for understanding invisible things” (2007, p. 8).*

Other qualitative methods such as Action Research, Phenomenology or Ethnography are less fit to help answering the main research questions. Ethnography focuses more on cultural groups (Corbin & Strauss, 2008; Creswell, 2007), that have certain attributes and practices. Phenomenology focuses more on the shared experiences that people have with certain phenomena (Corbin & Strauss, 2008; Creswell, 2007). Action Research focuses more on the collaborative solving of problems.



The table below (Table 2) shows the different ways in which data was collected to be able to give answers for the different research questions. The table below also reflects the triangulation that takes place between the different sources of information.

Table 2: Data collection methods.

Research question	Research method
Which location preferences were important for logistic companies prior to the development of E-commerce?	Literature study, Interviews with key people in logistic companies and logistic experts. Field notes during expert meetings.
Which location preferences have become (more) important due to the rise of E-commerce?	Literature study, Interviews with key people in logistic companies and logistic experts Field notes during expert meetings.
What are the differences between different sub-sectors in E-commerce?	Literature study, Interviews with key people in logistic companies and logistic experts Field notes during expert meetings.
What does this development mean for future location decisions and –preferences?	Literature study, Interviews with key people in logistic companies and logistic experts Field notes during expert meetings.

### 3.1.1 Grounded Theory

Grounded Theory allows for the comparison of empirical results to theories (Bryantz & Charmaz, 2007). By obtaining and analyzing new empirical data, comparisons can be made between the newly abstracted theory and existing theories (Bryantz & Charmaz, 2007). Grounded Theory comprises of the creation of theories out of texts. By analyzing texts in a systematic way it aims at satisfying two different objectives:

- 1- It reduces and gives interpretations of the original text by ‘coding’ and ‘categorization’.
- 2- It uncovers meaning of and contextualizes speech acts.

These objectives show that Grounded Theory creates or reveals knowledge out of data inductively (Bryantz & Charmaz, 2007). It does so by coding and categorizing parts of the text. Coding means that it links text sequences to concepts, labels or codes. There are different steps in the coding process, which will be dealt with in paragraph 3.2.1; this paragraph will also reveal the way Grounded Theory was used in this research. Categorization means combining the codes that were created into bigger groups of codes or higher order concepts (hyperonyms). By developing conceptual networks, developing linkages between the different concepts, theory is created from the texts (Bryantz & Charmaz, 2007; Creswell, 2007). The texts used for analyses in this research will be the most important parts of the interview protocols. Although all interviews will be recorded entirely, only the parts of the interview that are most important will be written down verbatim.

### *3.1.2 Expert interviews*

Interviews are a good way to examine motives, preferences and perceptions (Creswell, 2007). Therefore they are useful for this research. It is, however, important to realize that the respondents are answering for the company they represent. This means that they should and would not reflect their personal motives, preferences and perceptions. The interview guides was set up in such a way that they allow for a more open conversation on what factors influenced the (re)location decision. This is in line with the methodology of Grounded Theory (Creswell, 2007; Bryantz & Charmaz, 2007). By focusing excessively on factors ascribed importance in the literature, the interviews would not allow the respondents to choose their own direction, and provide new insights. Moreover, these interview guides and, consequently the interviews themselves, were set up and conducted in Dutch. Since the respondents will be Dutch this ensured that the respondents understand the questions correctly and were likely to be more able to produce substantiated thoughts and arguments.

### *3.1.3 Discussion of methodology*

It is difficult to generalize out of theories that are created through Grounded Theory (Bryantz & Charmaz, 2007; Creswell, 2007). The theories that arise out of Grounded Theory mostly give insight into the cases that were used to create the theory. Therefore it is impossible to generalize the insights this research could provide to a broader population. However, in this research it is more important whether or not the existing theories provide a sufficient explanation for firm (re)location behavior. If this research shows that other factors might be more important than what could be expected based on the literature, this means more research is needed taking these factors to account. If this research shows that the literature is right on the effects of E-commerce on (re)location behavior no generalization is necessary.

In order for Grounded Theory to be truly effective it is better to have no theoretical knowledge of the subject beforehand. This way the researcher can be more objective when ascribing codes, because existing theories are unknown to him. This objectivity is an important issue to consider when coding the texts, as it can easily shape the direction of the theory that arises (Corbin & Strauss, 2008). However, truly theory neutral observations and coding are impossible.

The internal validity of the interviews can become an issue in conducting this research, because the respondents function as representatives of the company, this makes it harder to know if respondents are honest and have full knowledge. However, internal validity is always problematic in interviews as there is always a possibility that respondents give dishonest answers (Creswell, 2007; Kirk & Miller, 1986).

## **3.2 Research material**

The research objects in this study are logistic companies. Key people give answers based on the experiences, motives and considerations of their company, and will be used as the respondents of the interviews. The choice to focus mainly on the companies is made because these companies can give the best perspective to make it possible to anticipate on (future) preferences. These companies

are likely to be the end users of the locations that are developed. However, experts were also interviewed to make it possible to nuance the findings on preferences as well as future developments. In addition literature on location decisions will be used. However, the conclusions of this study are mostly based on the interviews with the companies and the experts. Although this research does not focus merely on logistic companies that have opened up facilities as a result of E-commerce, an attempt was made to include as much such companies as (practically) possible. Due to this preference 5 out of 7 companies had relocated recently, making them more likely to have more insight in the factors that shaped their decision.

### *3.2.1 Data analysis*

Grounded Theory is a way in which textual data is analyzed. This analysis takes place by ascribing codes to certain textual sequences (Bryantz & Charmaz, 2007; Corbin & Strauss, 2008; Creswell, 2007; Hardy & Bryman, 2004). Coding is the core process in doing Grounded Theory (Bryantz & Charmaz, 2007). The first step in creating this analysis of the collected data comprises open coding of the textual sequences (Bryantz & Charmaz, 2007; Corbin & Strauss, 2008; Creswell, 2007; Hardy & Bryman, 2004). Open coding is done by reviewing the texts line by line, and ascribing codes as openly as possible, preferably without taking prior knowledge into account.

Axial coding is the next step in analyzing the textual data. This step aims at refining and differentiating the codes that were derived from open coding (Bryantz & Charmaz, 2007). In this phase the researcher selects the most relevant and promising categories of codes, to create hierarchies between the codes, and establish relationships between the categories. A distinction between different sorts of categories is also made. For example, categories that show causing factors will be distinguished from the categories that show the consequences.

The last phase is selective coding; this is a continuation of axial coding on a higher level of abstraction. The objective in this phase is to give the central category or concept around which all other categories can be ordered. This reveals the central story around which the theory will be constructed (Creswell, 2007).

### *3.2.2 Discussion of data analysis*

The manner in which the data of the interviews was handled in this phase of the research was not optimal. Early on in this research the choice was made to not just analyze parts of the interviews, but try to analyze these interviews completely, in order to add transparency. However, this has proven to be very time-consuming and detrimental to the thoroughness of the data analysis. Although this does not mean that the results that were gathered are not valid results, many underlying factors could have been uncovered better. However, the results that were expected from this type of research differ from the results of most Grounded Theory research. The phenomenon that is described in this research is much less complex, and more straightforward than other phenomenon studied with Grounded Theory. Therefore the results that have been gathered are valid in the sense that they reflect the answers given by the respondents and are therefore assumed to be the factors these companies deem important. Additionally, during the latter interviews only the location factors

were coded. This means that factors influencing these factors were not uncovered by data analysis. Instead, they were taken directly from the interviews.

### 3.3 Respondent selection

It is important to distinguish between the different types of actors in the logistic sector that are affected by E-commerce most (see chapter 2), on the one hand you have retailers who take care of their logistics internally, on the other hand there are companies that outsource their distribution to logistics service providers. In the former case the retailers themselves are object of study. In the latter case the service provider is likely to make the location decisions, and will therefore be the object of study. Additionally, these two groups of actors will be the subsectors that are examined in this research. In the selection process special attention was given to firm characteristics, because those were likely to influence the results of the interviews.

In order to gain access to companies in the field of E-commerce and E-fulfillment two expert meetings were visited, with mixed success. The first was the National Distribution Day, an event focused on logistic companies, with elements focusing on E-commerce. Due to its focus on logistics and the large scale of the event, this event did not provide any connections with companies in the field of E-fulfillment or E-commerce. However, the presentations that were given by experts and the informal conversations that took place did provide some field notes (see chapter 4). The other event was Logicommerce<sup>13</sup>; this event focused strongly on the field of E-commerce and E-fulfillment and was attended by many possible respondents. At this event, in consultation with the experts present at the meeting, some respondents who the experts mentioned before perceived as interesting for this research were approached. Moreover, after each interview, the respondents were asked if they knew companies that would be interesting for the research and were willing to collaborate.

Additionally, the selection of cases took place by examining news articles and press releases of the past years that show (re)location decisions connected to E-commerce. Furthermore, respondents were selected that have not made (re)location decisions, to be able to illustrate a representative image of the E-commerce field. However, most selected respondents have recently relocated their company. The preference for companies that have recently relocated was established because these companies are most likely to have thought about location factors recently. For the expert interviews professionals in the logistic sector were used.

Grounded Theory allows for the creation of theoretical knowledge through the analysis of data provided by a small number of respondents. The goal of this research lies in gaining empirical insight into how the factors that shape firm (re)location decisions have changed in response to the growth of E-commerce activities. This means generalization is not of paramount importance, what is more important is providing knowledge that is internally valid. The knowledge created should be true for the cases that were examined (Kirk & Miller, 1986). However, to be able to create some overarching theory comparison has to be made between different cases. Therefore it is useful to obtain data from as much sources as practically possible, also considering the time needed to analyze the data substantially.

A distinction was made in this research between the E-tailers active in E-fulfillment and logistics service providers. This distinction was made because these kinds of actors generally have different roles inside the supply chain of E-fulfillment. In addition to this, experts have stated that there are differences in location factors between E-tailers handling different types of products; this was backed by literature on this subject. Furthermore, expert interviews had indicated that differences in sales markets, for example at the national or European scale, would require different location factors. The specialized logistics service provider was examined because interviews and field notes showed that due to the characteristics of their goods they were likely to have different location preferences.

This research has obtained results from four retailers in different branches in the E-commerce field; one company aimed at consumer-electronics and bigger products such as laundry machines etcetera. One company is active in the fashion business, specifically in children's clothes. One company sells bicycle accessories. One company is active in animal products such as food and toys, which operates on the European market. All these companies had relocated recently, and made their relocation decision independent of their logistic service providers.

Additionally, results were obtained from three logistic service providers; these three were selected based on their characteristics. The first of these companies delivers to the Netherlands and a part of Belgium, and is therefore aimed at a more national market. The second of these providers operates at the European scale, this distinction is important because during the interviews the importance of sales regions and markets came up as a factor influencing the assessment of location factors. The last provider handles and distributes larger items, for which it needs its own distribution network. During other interviews the specificity of this type provider came up.

At the beginning of the research process two interviews have taken place with two consultants who focused on logistic companies professionally. It might have been favorable to have interviewed experts in the E-commerce field at this point already; however, these two professionals were able to give some basic insight into the field of E-commerce and made it possible to begin selecting respondents. Therefore the decision was made to interview these professionals due to my lack of connections in the E-commerce field and the possibility to interview these people directly.

During the research process two experts were interviewed to give more insight into the changes that have arisen in the location factors due to the rise of E-commerce as well as providing feedback on the interview results. These experts were selected based on their reputation in the field of E-commerce and their relationships with organizations in the E-commerce and logistic field.

### *3.3.1 Discussion of respondent selection*

As mentioned earlier the first two expert interviews were conducted with people who were not considered experts in the field of E-commerce and E-fulfillment. Although this does not necessarily mean they do not have insight into or know-how of the sector the reliability of the results of these interviews can be debated. However, since these interviews were aimed at providing grasping points in the selection of respondents, and possibly interesting developments in the field of E-commerce and E-fulfillment, the lack of acknowledgement of their expertise in the field of E-commerce does not provide any strong impediments in using the interview results. Additionally, most of the insights

these interviews have provided were backed by reports or were similar to the insights given by the other experts. The other experts that were selected are acknowledged experts in the field of E-commerce and E-fulfillment. The respondents who were selected and with whom the interviews were conducted are employees of very distinct companies that are active in different branches and at different scales.

In addition to discussing the respondents that were selected it is important to discuss the respondents that were not. Initially it was established that it would be important to interview pure players, companies that only sell via the internet, and multi-channel retailers, companies that have both offline and online flows of products. However, in the end it was practically impossible to establish connections and conduct interviews with multi-channel retailers, this was mainly because these companies are often much larger and harder to get into and less interested in collaborating with small researches. Furthermore, it would have been interesting to conduct an interview with a company selling food in the E-commerce sector. Since the interviews and field notes made clear that this type of product would lead to differences in both distribution networks and location factors. To portray the location factors of companies active in this branch of E-commerce, these kinds of companies were examined in depth during expert interviews. In addition to this field notes were collected during the events mentioned earlier.

The international scale, as in companies that have sales markets on a European level, was not represented enough in the respondents of this research. Although until now the national scale is most common in E-commerce, cross-border E-commerce will develop strongly in the future. However, these companies are also much larger than most nationally oriented companies and therefore it was harder to examine these. This, however, creates the risk of underrepresenting the companies that make their (re)location decisions most rational. As argued in chapter 2 the size of firms affect their (re)location decisions and ignoring the larger scale companies is likely to change the outcomes of the research if not discussed thoroughly. The two respondents that do operate on an international level provide insights for this discussion. More on this will follow in the discussion of the conclusions (Chapter 5).

Additionally, it must be noted that most of the respondents of the interviews with the companies could also be seen as experts of E-commerce and E-fulfillment, since most of them have been active in different companies and different roles in this field. This also means that part of the information obtained in an interview with one of the companies in particular (children's fashion), will be treated as information obtained through an expert interview. The respondent in this interview was also involved in an organization in the field of E-fulfillment that overarches the interests of individual companies.

Although parcel carriers are distributing higher volumes of packages, and have opened many more regional hubs in the Netherlands, the major parcel delivery company in the Netherlands were not interested in collaborating with this research because they believe that their behavior over the past years has not changed due to the rise of E-commerce, they argued that the new regional hubs are part of a new business strategy independent of the higher volume of packages.

No respondents were selected to discuss the sub question on the development of real estate that caters to the need of companies inside the field of E-commerce and E-fulfillment. This was partly due to the results of the interviews with these companies, and partly due to practical issues such as time.

### 3.4 Background of the interviews

The interviews were conducted in the form of in-depth interviews with respondents from companies and experts. The interviews took on the form of semi-structured interviews. This means that the respondents were interviewed based on an interview guide with predetermined questions, it is however, still possible to deviate from these questions. Interviews are a good way to examine motives, preferences and perceptions (Creswell, 2007). Therefore they are useful for this research. It is however, important to realize that the respondents answered for the company they represent. This means that they would and should not reflect their personal motives, preferences and perceptions. Furthermore, the literature was used in order to create worthy interview guides, these interview guides were checked with professionals working in the logistic sector. Moreover, these interview guides and, consequently the interviews themselves, were set up and conducted in Dutch, to ensure that the respondents understand the questions correctly and were likely to be more able to produce substantiated thoughts and arguments. Because the respondents will, most likely, be Dutch.

#### 3.4.1 Interview guides

This paragraph will be used to show the direction of the interviews. Although the interviews were set up and conducted in Dutch, this paragraph shows the direction of the question in English (see table 3). These interviews were conducted ex-ante, as the pre E-commerce phase is also included in the interview. However, for all of the E-tailers that were examined there was no pre E-commerce phase. The interview transcripts are included in the appendix.

Table 3: Initial interview questions companies.

<b>1. Pre E-commerce situation</b>	Which location factors were most important for the company's location decisions before the rise of E-commerce?
	How was the company's distribution network organized?
<b>2. Present situation</b>	Which location factors were most important for the company's location decisions after the rise of E-commerce?
	How is the company's distribution network organized?
	How has your company adapted its distribution network in order to accommodate internet transactions and distributions related to E-commerce?
<b>3. Future situation</b>	What kind of developments are likely to arise in the future of the company.
	How will these future developments change location needs and –preferences?
	How will these future developments change the organization of the company's distribution network?

Although these questions were not fixed, they did indicate the direction of the questions during the interviews. Therefore to some extent they were used in the interviews. However, during the process the questions have changed towards more concrete questions that were easier to answer for the

respondent. Nevertheless these questions may not have been thought out as well as the initial questions. Therefore it is important to reveal the background of the questions. Table 4 shows the new questions of the interviews.

Table 4: New interview questions companies.

Question	Motivation
What does your company do?	This question was used to examine the nature of their activities inside the supply chain. By asking this, their role becomes clearer, as well as their overall activities.
How is your distribution network organized?	This question reveals the way the company handles their distribution. This could have effect on their location factors
How do you receive your products, and ship them? And who are your partners?	This question was used to examine the nature of their activities inside the supply chain. By asking this, their role becomes clearer, as well as their overall activities.
How did you choose this location? Which factors were important and how did they stand in relation to each other? Can you try to describe these exhaustively? Or: <i>If you would choose a new location now, what would be the factors you would examine? Can you try to describe these exhaustively?</i>	This question was asked to reveal their location factors directly. Follow-up questions were developed during the interview, as well as, sometimes using factors from literature as starting points for follow-up questions.
Which building specific aspects were examined? Or: <i>Which requirements would your company look for in a building?</i>	This question was used to examine location specific factors that contribute to the decision. This was asked in case the respondents did not incorporate these types of factors in the answer of the last question.
Which factors are important for E-fulfillment in general?	This will describe the difference between their company and other companies and could also yield new results on their own location factors.
How does this relate to the time before the development of E-commerce?	This answers the question of the difference between E-commerce and pre E-commerce.
Which building specific factors are generally important for companies in E-fulfillment?	This will describe the difference between their company and other companies and could also yield new results on their own location factors.
How does this relate to the time before the development of E-commerce?	This answers the question of the difference between E-commerce and pre E-commerce.
What kinds of changes are likely to arise in the future of your company, and how will these influence future location decisions?	This answers the question of the future location factors.
Do you have something to add/ to remark?	

The interviews with experts comprised of the same phases as the initial interviews, however, the questions asked were formulated differently. Additionally, in the last two expert interviews, the experts were asked to reflect on the differences between the sub-sectors examined and the provisional conclusions that were made (see table 5), although the experts did not always collaborate with this. Furthermore, there should have been questions about the roles of the developing parties, see table 4, however, during the interviews these questions were not always examined.



Table 5: Interview questions expert interviews.

<b>1. Pre E-commerce situation</b>	Which location factors were most important before the rise of E-commerce?
<b>2. Present situation</b>	Which location factors were most important after the rise of E-commerce?
<b>3. Future situation</b>	What kind of developments are likely to arise in the future?
	How will these future developments change the location demands and preferences of companies in the E-fulfillment sector?
<b>4. Differences sub-sectors</b>	What differences exist between the different sub-sectors involved in E-fulfillment?
	Where do these differences come from?
<b>5. Provisional conclusions</b>	Do you think it is true that (insert provisional conclusion)?

### 3.4.2 Discussion of interviews

During the interviews some errors have been made. Especially during the first two interviews, little result was yielded, as shown above. Therefore the interview strategy was changed, this generated more results. However, it could also be argued that this difference arose because of the type of respondents of the interviews. The people who were interviewed after the change of strategy were part of bigger companies, and most of them were in some way connected to professional associations in the field of logistics or E-commerce. Therefore they might have had different perspectives on this research and on location decisions in general.

Additionally, the way these interviews were conducted might have benefitted from a more professional approach. During some interviews possibilities for follow-up questions were not taken because they were overheard, considered to be irrelevant or simply not addressed to not insult or irritate the respondent or guide the respondent in a certain direction. Especially during the interviews with the expert, the respondents were allowed to divert from the topics and questions of the interview excessively. This has led to the gathering of much information that was irrelevant to this research.

Furthermore, it was unclear to some of the respondents why they would be interviewed, this was somewhat caused by the way in which these respondents were approached. Because they were approached through other respondents or personal connections, the aims of the interview/appointment were not always communicated clearly. However, this did not mean that these interviews have not generated useful results, it is merely something that could have been improved.

## 3.5 Discussion of methodological framework

The methodology used in this research was Grounded Theory. Although Grounded Theory was able to provide an open view of the situation, and allowed the companies to reveal their thoughts and considerations, the overly open nature of the first three interviews was one of the weaknesses of the research. After yielding little result from these interviews the interview strategy was adapted, as

shown earlier. This new strategy of interviewing provided more guidance to the direction of the latter interviews, thereby yielding more result. In a sense this means that this researched moved away from Grounded Theory. Although the problems could possibly have been foreseen, the open nature of the research was important because of the explorative nature and the choice for qualitative research. Overall the research strategy did fit well with the aims of the research although sometimes the strategy could have been used more pragmatically to receive better or more interesting results. However, the question still remains whether or not the companies have answered the question exhaustively, although for the sake of validity it must be assumed that they have. This however, should have been checked more thoroughly in the first two interviews.

## 4 Results

This chapter will show the results of this research. Firstly it will describe the results of the interviews with each individual respondent. Paragraph 4.1 will describe the location factors of the different firms based on the interviews that were conducted. Additionally, this chapter will give some relevant background information on the firms themselves as well as the organization of its distributional network as both these factors are likely to influence the locational factors the company has assessed and taken into consideration. Paragraph 4.2 will describe the results of the expert interviews. Paragraph 4.3 describes the information that was collected through field notes during the events and around the interviews. Paragraph 4.4 will answer the main question of this research and discuss the results.

### 4.1 Firm interviews

This paragraph describes the results of the interviews with firms active in E-commerce and/or E-fulfillment. The first four sub-paragraphs (4.1.1-4.1.4) will describe the firms and the results of the interviews of the E-tailers that were examined. Paragraph 4.1.5 will describe the differences between the different companies and sub-sectors described. The subparagraphs 4.1.6-4.1.8 will describe the same issues for the logistic service providers that were interviewed. Paragraph 4.1.9 will describe the differences between the logistic service providers and the backgrounds for these differences.

#### 4.1.1 E-tailers

##### Consumer electronics

The consumer electronics company that was interviewed in this research originated from Rotterdam, it started off as a company at home that distributed its products out of the home through parcel distributors. As it grew it needed more space for warehousing and administration. In the beginning it started looking in the vicinity of the Rotterdam region. Due to the lack of availability in the Rotterdam area their present building is located in Capelle aan den IJssel. Due to the prices and the security demands they looked towards industrial zones instead of business districts. The property in Capelle a/d IJssel was selected mainly because of the presence of security measures. Recently they have opened a distribution center for their larger items in Tilburg. Although their preference was a location in the direct vicinity of the Capelle a/d IJssel distribution center for smaller products, they have chosen this location based on the assessment of trade-offs between different criteria. Originally they would have rather opened a distribution center next to their first distribution center to be able to share employees between these centers and their ties with the region. However, there were no plots or buildings available for this new distribution center.

Inside their warehouses they use their own systems and use people to product order picking. This means that they need a certain amount of labor power. Additionally, they need a small amount of place for the handling of return shipments, although they do not receive as much return shipments as in other subsectors of the E-commerce and E-fulfillment field. Additionally, they have some space

for Value Added Services. They deliver to both the Netherlands and Flanders, which is seen as nationally oriented, they use different logistic service providers for different products and delivery methods as well as country. The company allows its customers to order next day delivery products until midnight, because the company feels this is what their customers want, and they value customer satisfaction greatly.

In selecting their location for their Tilburg Distribution center they have looked at the mixture of different factors. The distance to different logistics service providers was one important aspect of their decision. Because of their time frame for next day delivery orders, they need locations near their logistic service providers to achieve their cut-off times. Their Tilburg center's location is better positioned in relation to their logistic service providers than their Capelle a/d IJssel location, especially towards Flanders, which has played a role in their decision. Additionally, the pricing of plots and buildings is more favorable moving away from the Rotterdam (or Randstad) area. Furthermore, it is important that the region has enough labor power, due to their labor intensive picking systems. Lastly, direct availability is important; therefore it is important that there is an empty warehouse in the region.

In their decision for their Tilburg location they have also looked at the height of the building, so they are able to store a large amount of products and can expand their warehousing vertically.

In summary, the most important factors taken into consideration by this company were.

- Distance to logistic service providers
- Pricing of buildings
- (Potential) Labor
- (Direct) availability of a building
- (Vertical) expansion capacity
- Height of the building

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The distance to logistic service providers can be explained as a secondary, 'location' factor. This factor is location specific since it comprises the distance to several service providers; it is secondary because of the role of service providers. Pricing of the plots of lands can be seen as a primary, firm-external factor, primary since it influences the production costs and firm-external since the level of pricing was not considered between several specific locations, rather more in general to select a possible region. The presence of labor in the region can be explained as a primary firm-external factor. Primary since it influences the costs of labor, and firm-external since it arises from the regional economic structures. Availability of a building can be seen as a tertiary, firm-external factor. Firm-external since it is the supply of suitable property, tertiary because the availability is to some extent created by the government. The expansion capacity of the building can be seen as a 'location' factor that does not fit into the division of primary, secondary and tertiary, therefore it is named as other 'location' factor. It is a 'location' factor because it belongs to the characteristics of this specific location. The height of the building is also named other 'location' factor, since it is specifically aimed at this location.

Table 6: Factors consumer electronics company.

Consumer electronics company			
Secondary 'location' factor	Primary firm-external factor	Primary firm-external factor	Tertiary firm-external factor
Other 'location' factor	Other 'location' factor		

Firm-external and location factors were most important in the decision of this company. Additionally, primary factors and factors that did not fit into these categories were most important (see table 6). However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly.

#### Miscellaneous products, nationally oriented company

The bicycle clothes and accessories E-tailer that was interviewed for this research can be seen as representative for companies that sell miscellaneous small items in the Netherlands. Due to the nature of its products it has no special location factors and/or demands or wishes to the building. In comparison this company is a very young company only a few years after its establishment it has grown in size and transaction volume. Their warehousing is organized internally. For their distribution they rely on a single logistics service provider, however, they did not take the location of their logistics service provider into consideration. This is because they do not want to be dependent on a single logistic service provider and argued that distances within the Netherlands are too small for distance to logistics providers to be an issue for them. For their newest location, they looked at the direct availability of a plot of land where they could build their own warehouse. They only searched in the direct vicinity of their existing property, due to their ties with the region, employees and private.

In summary, the most important factors taken into consideration by this company were:

- Regional ties
- (Direct) Availability of a plot

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The regional ties of the company can be seen as a tertiary, firm-internal factor. Tertiary since it is a behaviorally inspired connection to the area, firm-internal since the embeddedness is probably due to the life-phase and small size of the company. The availability of a plot of land is a tertiary 'location' factor. Tertiary since the availability of the plot is mostly generated by government behavior, firm-external since this is an example of the supply of suitable property.

Table 7: Factors nationally oriented miscellaneous products company.

Miscellaneous products, nationally oriented	
Tertiary firm-internal factor	Tertiary firm-external factor

The location of this company was solely chosen on tertiary factors. One of which was location specific, the other firm-internal (see table 7). However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly.

#### Fashion (Clothes for children)

The children's clothes company is representative for the fashion sector in some ways; however, it has to be acknowledged that the fashion sector itself is somewhat diffuse. Most fashion companies have a broad stock supply with little depth, like the respondent in this research. Other companies however, have more in depth and less broad stock supplies. This means that companies like the one interviewed tend to have more unique items, with lower amounts of these items in stock. This has great consequences for their warehousing system and (re)location decisions. In comparison to the other type of companies in the fashion sub-sector of E-commerce, companies like this E-tailer receive smaller amount of products through road delivery, the companies with more depth in their stocks receive their stocks via water and/or railroad as well. This means that these kinds of companies would preferably be located at sites that have access to these facilities. However, E-tailers with less depth in their stocks mostly require basic road access. This company was oriented at the national market, serving both the Netherlands and Flanders. They also use people to product order picking, which also means that their order picking is relatively labor intensive. They have a small area for Value Added services and return shipments, since they use policies that reduce return shipments in contrast to other fashion companies. Their delivery to Flanders is organized through the distribution network of the Dutch parcel deliverer. Due to the nature of their products and customers they do not need to be located near the logistics service provider, which is representative for the fashion branch. Moving closer to the logistics service provider would not cut costs for them.

For their location they seek a site that is located near a city that is large enough to have a relatively flexible labor pool, preferably with access to many part time employees (women and students). The company started off in the city where it is located now (Doetinchem). This region has a relatively flexible labor pool and lower labor costs than other regions. Flexibility of the labor power in the region is important due to the nature of the products. The cyclical changes in order volume necessitate a flexible organization labor wise. Additionally, the company would only consider locations near larger cities, because of the dynamics inside the employee pool. This can be explained as company strategy.

The role of hotspots in logistics was discussed in this interview. Although the hotspots give access to certain facilities, these facilities are not important for this company. Additionally, the hotspot image can facilitate that companies look towards a certain region. However, the presence of many logistic and production companies in an area can also have negative consequences for labor supply. Relatively skilled labor is widely available in these regions; however, competition for this labor power is high, therefore this company would not move towards hot-spots in the future.

Another aspect of their location decisions is the pricing of buildings. Prices in their area are relatively low, which would play a key role in future (re)location decisions. The organization and nature of their stock, with many very different individual items favors a large amount of floor surface, therefore square meters are more important than height. This partly explains the importance of plot prices.

Although they currently have multiple floors, a single floor with more floor surface would be favored, although warehousing solutions can be constructed to facilitate multiple floors. Additionally, they would look at the expansion possibilities of the site. Furthermore, they would favor renting a location over buying one, since the field of E-commerce is flexible and growing in comparison to other sectors.

In summary, the most important factors taken into consideration by this company are:

- Flexibility in, and size of, prices of and competition for Labor potential in the region
- Floor surface
- Possibility of expansion
- Pricing of plots and/or building
- Rent over buying.

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The flexibility in, the size of, and the competition for the labor markets can be seen as a tertiary, firm-external factor. These characteristics of the labor markets were outweighed independently and should therefore be seen as separate factors. They are tertiary because they comprise of the characteristics of the labor markets, and are not based on labor costs. They are firm-external since it is part of a regions economic infrastructure. The price of labor can be seen as a primary, firm-external factor, since this influence the labor costs. Floor surface can be seen as a 'location' factor that does not fit into the categorization primary, secondary and tertiary. It is a 'location' factor since it is location specific. The expansion capacity of the building can be seen as a 'location' factor that does not fit into the division of primary, secondary and tertiary, therefore it is named as other 'location' factor. It is a 'location' factor because it belongs to the characteristics of this specific location.

Pricing of the plots of lands can be seen as a primary, firm-external factor, primary since these prices influence the production costs and firm-external since the level of pricing is not considered between several specific locations, rather more in general on the regional scale. The preference for renting over buying can be explained as a 'location' factor. It does not fit into the other categorization, but is considered on a location specific scale, and is therefore a 'location' factor.

Table 8: Factors fashion company.

Fashion company			
Tertiary firm-external factor	Tertiary firm-external factor	Tertiary firm-external factor	Primary firm-external factor
Other 'location' factor	Other 'location' factor	Primary firm-external factor	Other 'location' factor

For this company, tertiary and 'other' factors were most important. Additionally, firm-external factors were more important than 'location' factors (see table 8). However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly. Furthermore, these comparisons were made under the assumption that several aspects of the labor market were considered individually, since they were mentioned individually during the interview.

Miscellaneous products, internationally oriented company

The company has reported to be somewhat representative for companies that are oriented towards the European market, although it was also indicated that their international orientation makes them unique in the field of E-fulfillment. The characteristics of their products do not shape their own location preferences and –factors. Although there are likely also differences between companies in different branches on a European scale, the difference between the different branches are probably similar to the differences between the branches on the national level. They hire logistic service providers to design and operate their warehousing systems and operations nevertheless they take care of international transport themselves. They receive their products in containers shipped from Asia to the harbor in Rotterdam. Their main markets are Germany, France and the Benelux.

They have also considered locations in Belgium and France for their location, which is at present in Tilburg. However, they have chosen to look for a location inside the Netherlands because of the differences in labor markets, and government regulations, respectively the tendency to strike and the costs of opening up a business in these countries. Other government regulations that are taken into consideration are more product specific regulations and certifications. Due to the nature of their products and the risks of packaging such different and sometimes fragile products into the same package they have searched for a location with access to labor power with experience in this field. Like the other E-tailers their packages are mostly collected by parcel delivery companies for the national market.

For their locations they look mostly towards its relative position towards their bigger and/or growing markets. They assess whether the costs of transport outweigh the costs of producing the packages locally, and decide whether to open up a local warehouse based on this assessment. They have multiple warehouses, where one contains only fast movers and the two others contain all their products. If they would open a new warehouse closer to their growing markets they would most likely decide to only distribute their fast movers from these locations. For selecting a new location they would look towards their sales markets and the costs of production, what these costs of production consist of is however, still unclear and not elaborated on. Additionally, they would look into the accessibility and distance towards transport hubs. They would preferably be near to different transport hubs. Building specific factors that influence their decisions are an automated warehousing solution as well as expansion capacity.

In summary, the most important factors taken into consideration by this company are:

- The relative position towards sales markets
- Their inbound flow of products (access to the harbor)
- Differences in labor markets
- Government regulations (product specific and general)
- Experienced (potential) personnel in the region
- Assessment of production costs versus transport costs
- Distance to and accessibility of transport hubs (logistic service providers)
- Expansion capacity
- Automated warehousing systems



When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The relative position towards sales markets can be seen as a secondary, 'location' factor. Their inbound flow of products, in this case access to harbor is an example of a primary, 'location' factor, because the accessibility of the harbor is important for keeping transport costs low. The differences in labor markets are a tertiary, firm-external factor, since the differences are mostly perceived as differences in mentality and culture. The government regulations are tertiary firm-external factors. The presence of experienced personnel in the region is a tertiary, firm-external factor. The outweighing of transport costs and production costs are both examples of primary, firm-external factors. The distance to, and accessibility of transport hubs can be explained as secondary, 'location' factors. Expansion capacity can be seen as a 'location' factor that does not seem to fit into the primary, secondary and tertiary division. Automated warehousing systems can also be seen as a 'location' factors that does not fit well with any of the other categories.

Table 9: Factors internationally oriented miscellaneous products company.

Miscellaneous products, internationally oriented company			
Secondary 'location' factor	Primary 'location' factor	Tertiary firm-external factor	Tertiary firm-external factor
Primary firm-external factor	Primary firm-external factor	Secondary 'location' factor	Other 'location' factor
Other 'location' factor			

For this actor 'location' factors were more important than firm-external factors, and primary factors were more important than secondary or tertiary factors (see table 9). However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly.

#### 4.1.2 Differences E-tailers

The table below (Table 10) shows the differences in the location factors that the different companies in the field of E-commerce have. This list is not exhaustive as other differences and other types of E-tailers can be recognized and distinguished. However, these results give us insight into the location factors that are important to these actors. Although the aim is not to generalize these results to bigger groups of companies, the companies themselves, as well as the experts that were interviewed agreed upon some representativeness of the companies that were examined. Although as mentioned, in some cases business strategies also shape location factors, and these strategies differ between companies within the same branch. As portrayed in the return shipment discouragement policy of the children's clothes company, this leads to fewer surface required for return shipments handling. Additionally, the late cut-off time of the consumer electronics E-tailer requires them to locate nearer to logistic service providers than other E-tailers in the same branch.

Table 10: Location factors of E-tailers.<sup>1</sup>

Consumer electronics	Miscellaneous national	Fashion	Miscellaneous international
Primary firm-external factor: 2	Tertiary firm-external factor: 1	Primary firm-external factor: 2	Primary 'location' factor: 1
Secondary 'location' factor: 1	Tertiary firm-internal factor: 1	Tertiary firm-external factor: 3	Primary firm-external factor: 2
Tertiary firm-external factor: 1		Other 'location' factor: 3	Secondary 'location' factor: 2
Other 'location' factor: 2			Tertiary firm-external factor: 2
			Other 'location' factor: 2

The smallest and newest company was the only company that mentioned a firm-internal factor as an important factor in their relocation decision (see Table 10). In contrary to the other companies their regional ties have played a big part in their relocation decision, or at least big enough to be mentioned. The nationally oriented firms look relatively little towards 'location' factors in comparison to the internationally oriented firm. This probably arises out of the fact that the internationally oriented firm has a bigger role in the transportation of the goods, the other companies receive their products from suppliers within the Netherlands and their products get picked up by parcel deliverers. Therefore the transport is calculated into their prices; this means that their location has relatively little influence on their costs.

Overall the E-tailers look most towards tertiary factors (8), followed by primary factors (7) and factors outside these categories (7). Secondary factors were only named three times. Additionally, the companies looked more towards firm external (13) than 'location' (11) factors. This can be argued to arise from the level-playing field inside the Netherlands, when it comes to transport.

When looking more in-depth into the factors that shape the location decisions of these companies the differences seem to be big. The more internationally oriented animal product company seems to take many more factors into account. Not only do they look at legislative and cultural labor market contexts of their possible sites, they also look at their incoming flow of products. In the case of the more nationally oriented companies, the outbound flow of products is much more important than the inbound flow of products. These companies do not make costs for their inbound flow of products, since their suppliers calculate these into their prices. Additionally, most of their products come from suppliers within the Netherlands.

Most companies look at the regional labor markets, some in more detail (children's clothes company and animal product company) others examine only the amount of potential labor. Direct availability of a plot of land or building can influence both the choice for a region as well as the choice for a specific building and/or plot, especially for growing E-tailers. Furthermore, the pricing level of an area influences the (re)location decision for both the consumer electronics- and the fashion company. Most likely it is also important for the company selling animal products, although only indirectly through their calculation of production costs. However, this does mean that it is of lesser importance to this company.

<sup>1</sup> The numbers indicate the amount of times this category has been mentioned during the interviews

Three out of four companies examined reported that the expansion capacity of the building would play, or has played, a role in their (re)location decision. The height of the building was only reported by the consumer electronics companies, and only for their warehouse handling bigger products such as laundry machines etcetera. Floor surface was reported by the children's clothes company to be an important aspect of their future (re)location decisions, because of the nature of their product. To both the company selling bicycle accessories and children's clothes the distance to logistic service providers or parcel deliverers does not matter as much as it does to the consumer electronics company and the E-tailer in animal products. This has two distinct reasons, reportedly their customers do not need these products swiftly; clothes and accessories are less critical than animal food and some electronic appliances. Furthermore, their customers are less demanding; their target customers can wait a few days to receive these products, whereas especially in consumer electronics the customers want to enjoy his product directly. This means that the nature of the product affects both the demands regarding the building as well as other location factors.

#### *4.1.3 Logistic service providers*

##### *Nationally oriented service provider*

The nationally oriented logistic service provider that was examined in this research was located in Vianen. They offer the full circle of service, this means that they not only provide transport but also produce web shops and organize its contents and marketing. They also help in buying the products to sell and provide the Value Added Services such as packaging. Additionally, they arrange reports and provide customer service and care and financial fulfillment. Most of the products their customers sell are not located in their warehouse, but the fast-movers are located in this warehouse. Although the warehousing and logistical activities such as cross-docking are an important aspect of their overall activity, their full circle of service also requires many employees. Their suppliers transport the products that are sold to them and in their location in Vianen the service provider combines and/or packages products by cross docking incoming flows of products. Their products are then transported towards parcel deliverers in the Netherlands and Flanders. Additionally, they direct the supply chain if direct drop-shipping is better for a certain transaction. Their customers calculate their location into their (re)location decisions, but they do not take the location of their customers into consideration.

Before the development of E-commerce this company was already active in the mail-order business. At that time this location was chosen because of its central location in the Netherlands and its accessibility to major highways (a2 and a27). Although the process is basically the same as in the mail-order era, the time frame the company has for delivering the products has become shorter. Therefore it has become more important for them to have efficient connections to parcel deliverers. This has made it better to be near to the next company in the supply chain. Being nearer to these depots gives the company more time to cross-dock and package, and allows later order times for next-day delivery. However, being too near to only one parcel deliverer would make the company dependent on this deliverer, which is strategically not practical. Additionally, their distance to several logistics service providers is assessed strategically.

However, the company recognizes the role of regional ties and the location of residence of the owner, that shape a company's decision to locate somewhere. Their building does not have many

specific requirements, although it does need a hall for masses of products that needs to be higher than the other parts. Furthermore, they need floor surface because they need many locations for their many different products. Automation is a strategic decision that influences the weight the floor must be able to support. In their case, the machines required a floor able to support heavy machinery. E-commerce and E-fulfillment companies need availability of large plots and buildings, additionally, the prices of these plots and buildings are important. Moreover, their current location was chosen because it was located at a new industrial zone.

Another important aspect for their (re)location decision would be the accessibility of their location for their employees. Because their activities mostly require unskilled labor, most of their employees do not own a car; therefore there should be access to public transport. In the present situation temp agency has organized their transport service. Additionally, this means that a location near a train station would be preferred. Labor potential in the region is an important factor, however, it was noted that this is complex to assess.

In the future the role of labor power in the region will become more important due to the aging population in the Netherlands. However, this will be somewhat canceled out by the development of automation in the field of E-commerce. Additionally, in the future, the customer should be more in control of the delivery process. They should be able to select the time and place of the delivery freely. Furthermore, future location decisions will be oriented more towards the total supply chains, and E-commerce will also affect the (re)location decisions of producers. Lastly the development of cross-border E-fulfillment will change which locations are central, due to the difference in sales markets. With these bigger regional sales market the late order times for next-day delivery are not achievable, unless the E-tailer has multiple warehouses; this is however, not achievable because of the risks and costs of maintaining multiple stocks with high amounts. The same thing goes for multi-channel retailers.

The most important location factors for this company were:

- Distance to parcel delivery hubs
- Central in the Netherlands
- Access to highways
- Access to public transport
- Labor market (potential)
- Availability
- Large floor surface
- Floor able to support heavy machinery
- Height of buildings for bulk storage

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The distance to parcel delivery hubs can be seen as a secondary, 'location' factor. Secondary because of the role of these hubs as service providers and 'location' because of the emphasis on distance, this means it is location specific. Centrality in the Netherlands can be seen as a secondary, 'location' factor. This factor is considered to be the distance to suppliers and sales markets; therefore it is both location specific and secondary. Access to highways can be seen as a primary, 'location' factor. This access lowers transport costs and is location specific, since the access of the location was considered.

The access to public transport is directly linked to the access to labor markets in the region. Therefore the access to public transport is seen as a tertiary, 'location' factor. It is location specific in the sense that it is not taken into consideration when deciding for a region, but is considered when deciding between different locations. It is tertiary because it is not aimed at the labor costs, but rather to the accessibility of the labor markets.

The presence of labor in the region can be explained as a primary firm-external factor. Primary since it influences the costs of labor, and firm-external since it arises from the regional economic infrastructure. Availability of a building can be seen as a tertiary, firm-external factor. Firm-external since it is the supply of suitable property, tertiary because the availability is to some extent created by the government. Floor surface can be seen as a 'location' factor that does not fit into the categorization primary, secondary and tertiary. It is a 'location' factor since it is location specific. The requirements surrounding the floor can be seen as a 'location' factor as well. The height of the building is also named other 'location' factor, since it is specifically aimed at this location.

Table 11: Factors nationally oriented service provider.

Nationally oriented service provider			
Secondary 'location' factor	Secondary 'location' factor	Primary 'location' factor	Tertiary 'location' factor
Primary firm-external factor	Tertiary firm-external factor	Other 'location' factor	Other 'location' factor
Other 'location' factor			

Table 11 above shows that factors that do not fit into the categories primary, secondary or tertiary are most important for this actor. Additionally, this company focuses on 'location' factors in location decisions. However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly. Additionally, it must be mentioned that this company has not relocated in the recent past, and is therefore not likely to have thought about location factors thoroughly.

#### Internationally oriented service provider

The internationally oriented service provider examined in this research is a division of an all-round transport company. This division is mostly active in contract logistics; this means that they take care of warehousing for other companies. They have three very different kinds of customers, one group active in medical appliances, the second in b2b electronics. The last group are their E-commerce customers with their web shop warehousing, that are active in different sub-sectors of E-commerce. They also offer the possibility to organize the inbound flow of goods, and the financial aspects of importing and stocking goods. In their warehousing solutions they offer VAS and cross-docking. They can also organize transport throughout Europe, but this transport is mostly organized via other logistics service providers specialized in transport. Their warehousing takes place in their own warehouses which they rent with long-lasting contracts.

When looking for a location several factors are important to them; firstly there has to be availability of big plots or buildings, with lots of square meters. Additionally, the prices of these locations are important. Furthermore, the local labor market should match the products of the customers. High

tech medical appliances require higher skilled employees. Because of their focus on European markets they look more towards their location relative towards multiple transport hubs in different countries. Therefore they have chosen locations in Noord-Brabant, nearer to the borders than nationally oriented companies, where they have access to multiple hubs in France and Germany. This makes this step in the supply chain shorter and less costly. Furthermore, this region has good access to other sales markets in Europe. Additionally, many of their customers need to be closer to the harbors of Rotterdam and Antwerpen to manage their inbound flow of products.

An important aspect for internationally oriented companies to choose the Netherlands for their location are the legislative measures the Netherlands has undertaken to become attractive for such companies. The most important example is that companies in the Netherlands can discuss the timing of their VAT-payment. These companies do not need to pay money when importing goods, because they are sometimes allowed to pay at the moment of selling the products. This creates cash-flow benefits. Other countries have the same system or are investigating it; however, the system in the Netherlands is more extensive and makes the country more attractive.

Access to highways is also important for logistics service providers, in order to cut delivery times. These delivery times are more important for business to consumers companies than business to business companies, since most businesses do not need their products directly. This is also because the consumers pay in advance.

They also have building specific requirements because their company strategy requires them to meet the necessities of multiple certification systems. These are mostly security measure such as camera systems and fire resistant doors. These certifications are mostly necessary for customers in high tech electronics and medical appliances; however, they also search for these assets for warehouses for E-commerce. This is unique in the field of E-fulfillment. However, this will change in the future, where these certificates will become important for E-fulfillment as well. Furthermore, E-commerce and fulfillment will become more cross-border in the future, this means that companies will select their location relative to Europe and have one central distribution location with many local distribution location where they distribute only small amounts of fast movers. Additionally, return shipments should often be inside the country of the buyer due to legislative reasons. This also influences the companies to have more local distribution centers, nearer to the customers. These should be located near to the transport hubs of logistic service providers.

The most important location factors for this company were:

- Distance to different transport hubs in different countries
- Production costs (vs. transport costs)<sup>2</sup>
- Pricing of buildings
- Labor market (that fits their customers' product)
- Government regulations
- Near a harbor
- Access to highways (more important for B2C)
- Certification requirements (mostly security)

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<sup>2</sup> Derived from interview with client. See Miscellaneous products, internationally oriented company.

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The distance to, and accessibility of transport hubs can be explained as secondary, 'location' factors. The outweighing of transport costs and production costs are both examples of primary, firm-external factors. Pricing of the plots of lands can be seen as a primary, firm-external factor, primary since this influences the production costs and firm-external since the level of pricing was not considered between several specific locations, rather more in general to select a possible region. The characteristics of the labor markets are a tertiary, firm-external factor. The government regulations are tertiary firm-external factors. Distance to a harbor is an example of a primary, 'location' factor, because the accessibility of the harbor is important for keeping transport costs low. Access to highways can be seen as a primary, 'location' factor. This access lowers transport costs and is location specific, since the access of the specific location was considered. The certification requirements can be seen as a tertiary, 'location' factor.

Table 12: Factors internationally oriented service provider.

Internationally oriented service provider			
Secondary 'location' factor	Primary firm-external factor	Primary firm-external factor	Primary firm-external factor
Tertiary firm-external factor	Tertiary firm-external factor	Primary 'location' factor	Primary 'location' factor
Tertiary 'location' factor			

This company focuses more on primary factors in location decisions. Additionally, firm-external factors are more important to this company than other factors (see table 12). However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly.

#### Specialized service provider

The specialized service provider interviewed in this research focuses on distribution of larger items that require two people to deliver. Originally the company was not active in E-commerce but in classic transport logistics. Their E-commerce started with smaller customers. Eventually, bigger customers came into the picture for them, which also brought about a distinction between smaller and bigger items, which required other forms of distribution. The growth of the sector meant that their original location in Zaandam became too small. The differences in the products also requires different sort of employees. Their decision was mainly made by calculating the costs. For example the costs of warehouses, losing certain employees and the loss of knowledge. These sunk costs were compared to the advantages of other locations such as being nearer to the biggest part of their sales market. Especially in distribution with large items, where transport costs per item are relatively high, it is important to make more drop-offs per trip, additionally, the duration of the trips is important due to the duration of the trips for their employees. E-commerce has made their delivery time shorter, and has made their customer base bigger.

Because of the direct need for a new warehouse direct availability was important. If there would have been time to build their own warehouse they would have been located somewhere else. The

company needed a building with height and at least 10.000 square meters. Other elements that were important for the decision for their current building in Tiel; Price of the building, a central location in the Netherlands, local labor market with experienced people, relatively many loading docks, a lot of outside space surrounding the building and a planning office in the middle of the building. Additionally, they have chosen a location nearer to one big possible customer.

The most important location factors for this company were:

- Nearer to consumers than other E-fulfillment due to their products
- Direct availability
- High amount of square meters
- Height of the building
- Central in the Netherlands
- (Experience in) Labor market
- High amount of loading docks
- Near possible customer
- Price of building

When looking back on the theoretical framework of this thesis we can ascribe these factors to the following categories:

The distance to sales markets can be seen as a primary, 'location' factor in this case. Since the distance to sales markets was considered through the transport costs, and the distance was considered on a location specific basis. Availability of a building can be seen as a tertiary, firm-external factor. Firm-external since it is the supply of suitable property, tertiary because the availability is to some extent created by the government. The amount of square meters is categorized as other 'location' factor, because it does not fit into the categorization of primary, secondary and tertiary, and deals with the characteristics of the specific locations. The height of the building is also named other 'location' factor, since it is specifically aimed at this location.

Centrality in the Netherlands can be seen as a secondary, 'location' factor. This factor is considered to be the distance to suppliers and sales markets; therefore it is both location specific and secondary. The presence of (experienced) labor in the region can be seen as a tertiary, firm-external factor. This is because it is caused by the regional economy. The high amount of loading docks is categorized as other 'location' factor, because it does not fit the categories primary, secondary and tertiary, and is location specific.

The distance to a possible customer is a secondary, 'location' factor, since the distance to this 'supplier' is location specific. The price of the building was considered on a location specific scale, and is used to keep production costs lower. Therefore it is a primary, 'location' factor.

Table 13: Factors specialized service provider.

Specialized service provider			
Primary 'location' factor	Tertiary firm-external factor	Other 'location' factor	Other 'location' factor
Secondary 'location' factor	Tertiary firm-external factor	Other 'location' factor	Secondary 'location' factor
Primary 'location' factor			



For this company, 'location' factors were more important than other factors in their recent relocation decision (see Table 13). Additionally, factors that do not fit the categorization of primary, secondary or tertiary were more important than the factors in these categories. However, this is based on the amount of factors mentioned during the interviews, their weight in the decision has not been examined thoroughly.

#### 4.1.4 Differences logistic service providers

The table below (Table 14) shows the differences in location factors for different logistic service provider. The differences between the different types of logistic service providers are quite big. The specialized logistic service provider takes care of the last mile for other companies. Therefore they do not need to be near transport hubs, but looked for a location near the mass of their customers. Both nationally oriented and internationally oriented service provider search locations near to transport hubs (for parcels). Both the nationally oriented service provider as the specialized service provider looked for a location central in the Netherlands. The internationally oriented service provider also took the inflow of products into consideration for their location decision. In all three cases the potential labor market was an important location factor. Access to highways was important for both normal service providers. The internationally oriented service provider also looks at government regulations.

Table 14: Location factors of service providers. <sup>3</sup>

Nationally oriented service provider	Internationally oriented service provider	Specialized service provider
Primary 'location' factor: 1	Primary 'location' factor: 2	Primary 'location' factor: 2
Primary firm-external factor: 1	Primary firm-external factor: 3	
Secondary 'location' factor: 2	Secondary 'location' factor: 1	Secondary 'location' factor: 2
Tertiary 'location' factor: 1	Tertiary 'location' factor: 1	
Tertiary firm-external factor: 1	Tertiary firm-external factor: 2	Tertiary firm-external factor: 2
Other 'location' factor: 3		Other 'location' factor: 3

When looking at the amount of factors of the different categories that were mentioned, we can notice some very interesting results. The service providers in general looked more towards primary factors (9) than the other categories of factors. Tertiary factors (7) follow the primary factors. Other factors were mentioned six times, and secondary factors only five times. The high amount of primary factors is mostly created through the internationally oriented service provider, this company based their decision mainly on primary factors.

'Location' factors are most important for service providers in the field of E-fulfillment. This type of factor was mentioned nineteen times. Firm-external factors were mentioned nine times, mostly by the internationally oriented firm. This most likely arises from the fact that firm-external factors vary

<sup>3</sup> The numbers indicate the amount of times this category has been mentioned during the interviews

greatly between different countries. Because transport is of great importance to service providers 'location' factors are more important, because some of these influence transport costs directly. Additionally, logistic service providers have building specific demands.

## 4.2 Expert interviews

### Expert interview 1:

This interview was aimed at revealing interesting differences between companies and providing more direction for this research. The most important results from this interview were:

The expert has stated that before E-commerce the most important factors were costs of inbound and outbound flows of products. These factors can be seen as primary, 'location' factors. Additionally, many traditional transport companies make use of different forms of transport. Access to these transport modalities, are primary, 'location' factors. Normal transport companies require availability of large buildings with height and rectangular buildings in order to be able to distribute many products. These factors are other, 'location' factors. According to this expert many traditional logistical companies are located at the border in the Netherlands in order to make use of profitable tax-regulations. This can be seen as primary, firm-external factors, since these regulations are part of the economic structure and influences the companies through the labor costs. Availability is an important location factor for more traditional logistics companies, this is an tertiary, firm-external factor.

This expert has stated that due to E-commerce more Value Added Logistics and Value Added Services were added to the process. Additionally, he stated it is important to understand the distribution network of the companies and how this influences the factors that are important for their location decisions. Therefore these questions were included into the interviews (see chapter 3). Furthermore, this expert has argued that it is important to focus on the differences between sales markets; therefore important to compare internationally oriented with nationally and regionally oriented companies. Due to this, a sensibility towards the sales markets of the companies was incorporated into this research. Concerning this, the expert has stated that Internationally oriented companies take more factors into consideration when taking a (re)location decision.

### Expert interview 2:

This interview was aimed at revealing interesting differences between companies and providing more direction for this research. The most important results from this interview were:

According to this expert direct availability of locations can be decisive. Creating knowledge in a region is not likely to attract companies. Governments can be important in creating attractive locations for E-fulfillment, by creating available plots, and allowing the companies to build their buildings to their requirements; therefore availability of plots of land and buildings can be explained as tertiary, firm-external factors. In the future, companies will have to be nearer to the markets and be more flexible. Centralized solutions are less possible, since these lack flexibility. This can be seen as a secondary, 'location' factor. According to this expert the distance to sales markets and parcel

deliverers are important aspects of location decisions in E-fulfillment. These are secondary, 'location' factors.

#### Expert interview 3:

This interview was aimed at discovering the factors that have gained importance due to the rise of E-commerce and getting feedback on my research findings from these experts. The most important results were:

This author has stated that sometimes, in multi-channel retail, it is beneficial to be able to combine online distribution with offline distribution to give customers the freedom to pick up their products in stores. Thereby using the setup of the offline distribution system.

The expert acknowledged that many locations in E-fulfillment are chosen based on historical factors. Many locations are chosen in the vicinity of the place where the company has started off. This is mostly due to sunk cost regarding the employees and personal ties. However, bigger parties focusing on the European market transcend these historical factors and look towards more 'fundamental' factors such as: where are the customers, how can transport costs and delivery time be minimized and how can different services be offered. This is in line with the results regarding the internationally oriented service provider; however, this does not fit the results of the internationally oriented E-tailer.

Most important factors for E-fulfillment companies are currently: their sales markets. In addition to this availability of buildings and plots of land is essential. Minimizing transport costs and delivery time plays a significant role as well. The distance to transport hubs of parcel deliverers is important to ensure a good connection.

However, the author has stated that the field of E-commerce is still very young and location strategies are not fully developed yet. According to this expert differences between different sub-sectors arise mostly due to differences in products. Product types with shorter life-cycles such as consumer electronics and fashion tend to be organized more centrally. This is due to the effect that shorter life-cycles has on keeping stocks and their seasonal character. Additionally, this is also due to the handling of return shipments. Furthermore, maintaining multiple stocks is not profitable with short life-cycles. The more stocks of a company are decentralized the bigger the conflict with the short life-cycles become. Food has to be delivered swiftly because during its delivery it must be conditioned. Therefore food related E-fulfillment has to be near to the customers, to keep distances short. The ratio between volume and value of the product is an important aspect in choosing the distance to the consumers.

This expert also argued about important aspects related to the future of E-fulfillment and E-commerce. In the future E-fulfillment and E-commerce will become more focused on cross-border activity. In the Netherlands the distribution structure of parcels is designed for next day delivery. This is impossible in other countries. In the future, the consumers in the Netherlands will have to accept longer delivery times when E-commerce has become more cross-border. In the future other factors are going to be more important: Availability of labor, costs of labor (although these two will become less important due to automation and mechanization, however, it will still have more importance than in more traditional logistic companies/activities), the location of the consumer. In the future

producers will adapt their strategies to more direct supplying towards the consumers. This will also shape their location decisions, making their distance to the markets more important. Although these direct deliveries from producers will not grow to an high amount of the total E-commerce market.

#### Expert interview 4:

This interview was aimed at discovering the factors that have gained importance due to the rise of E-commerce and getting feedback on my research findings from these experts. The most important results were:

Outbound flows are most important. The expert has stated that the connections to roads, in order for outbound flows of trucks to deliver the products effectively, are most important in this regard. The expert argues that delivery times become shorter; therefore these connections are important to all parties in the field of E-fulfillment. Flexibility in the process and connection to the next point in the supply chain are the consequences of these shorter delivery times.

In the past, costs of locations were most important to logistic players, as well as transport costs. Government funding was needed to lower the costs for these companies and attract them. Therefore, for logistics companies in the past, primary 'location' factors such as transport costs and cost of locations were important. Additionally, government funding was of significant importance. This can be explained as a tertiary, firm-external factor.

In the future different forms of transport for inbound become important. Empty warehouses near terminals are adaptable to E-commerce. In the future more transparency and communication between different actors inside the supply chain could develop. Another scenario could be many smaller players. Transparency means that companies will know the whereabouts of their products and are able to optimize their transport. This could also help in producing near warehouse locations. Changing the locations of production could eventually follow from this.

Smaller companies stay in their immediate vicinity, few differences between sub-sectors. This shows that firm-internal factors influence the location decisions of the companies. Hubs are more important to European players, to have access to local networks, this means that differences in sales markets create differences in the importance of this access. Flexibility in labor needed because of patterns in order behavior of the customers.

### 4.3 Field notes

In addition to the results gathered from the interviews some information was gathered from field notes during the events that were attended and surrounding the interviews with the companies. The information that was gathered will be described chronologically.

#### Interview expert 1:

Aspects that might be important for (re)location decisions:

- The speed of the delivery
- The manner in which goods are handled

- Outsourcing not only based on costs, but also based on guarantees on delivery speed.
- The field of E-commerce and E-fulfillment is diffuse; there are many different sub-sectors.

Interview expert 2:

The location of and distance to the customer is very important, in particular due to the flexibility that is required. Traditional logistics more aimed towards businesses instead of consumers.

Nationale Distributie Dag:

Transport costs are higher in Food related E-commerce than other forms of E-fulfillment. This is partly because normal E-fulfillment can make use of existing parcel delivery distribution systems and E-fulfillment in the food sector has to be delivered independently and orders have to be combined locally. Therefore there is also more Value Added. Due to the costs of delivery these E-tailers locate themselves nearer to the larger cities, making an as large as possible sales market accessible in the shorter delivery times that are needed when handling fresh products. Therefore these companies have to be nearer to their customers, because they also take care of the last mile themselves. In Pup's this means that they follow retail like location patterns, where accessibility and large flows of people are important. Furthermore, the food sector requires different warehousing systems and automation, because products come in bulk and need to be combined into crates. In other sectors there are more unique products that are combined into packages with fewer items.

Logicommerce13:

The outbound flow of products is more important than the inbound flow of products in E-commerce, in contrast to other logistics. The costs of outbound are higher than in traditional logistics due to the high number of single packages and different destinations. This makes other locations more interesting, especially those nearer to the consumer. E-commerce is becoming more cross border; bigger companies are going to acquire a strong position on the European market. Although these bigger companies are not going to organize their distribution network from one central location, the sales markets of the individual distribution centers will become bigger.

Interview consumer electronics:

The costs of inbound are lower for E-commerce companies because the prices are calculated into the prices they pay to their suppliers. Therefore there are no costs for transport into the distribution center. Costs for outbound are higher, and are paid per outgoing package. This company has many different logistic service providers throughout the country and their location decision was strongly dependent on their locations. The distance to these providers is important for a speedy delivery and flexibility in the process.

Interview nationally oriented service provider:

HEMA and V & D were both multi-channel retailers who were looking for locations for their E-commerce distribution. It is however, difficult to organize the E-commerce part in such a manner that both warehouses are still efficient. Maintaining two warehouses is impossible. For developing parties it is important to place the entrances and exits in a way that facilitates security. Furthermore,

it was stated that E-fulfillment activities should not be seen as purely logistical activities, as they have elements of production.

Interview nationally oriented parcel deliverer:

Changes in distribution network not due to E-commerce. There was a need for more efficient distribution of packages. They do not consider the locations of their customers when opening a new distribution center. Outbound is more important in their distribution than in inbound. However, inbound was still important as their centers are now located nearer to both destinations and points of picking up the packages. The rise in the amount of distribution centers allows for a more efficient handling of packages. Additionally, they look into the labor potential in a region, the availability of a location and the price of the building.

## 4.4 Results

The aim of this research was *“To gain insights into the changes that arise in location preferences in (re)location decisions of (logistic) companies due to E-commerce, to anticipate on present and future location preferences.”* It tried to achieve this aim by answering the main research question: *“What changes have arisen out of the ongoing development of E-commerce and E-fulfillment in the (re)location decisions and preferences of companies in the logistics sector, and how can locations be developed that cater to the needs of the end users?”* This question was divided into several sub-questions.

### 4.4.1 Pre E-commerce

This sub-paragraph tries to answer the question: *“Which location preferences were important for logistic companies prior to the development of E-commerce?”*

This paragraph will answer this main question by reviewing each sub-question individually. Sub-paragraph 4.4.1 will reveal the location factors that were important prior to the rise of E-commerce. Sub-paragraph 4.4.2 will elaborate on the location factors that have become important due to the development of E-commerce. Sub-paragraph 4.4.3 will explore the future developments that were discussed and look into their consequences for location decisions and –preferences. Sub-paragraph 4.4.4 will summarize the differences between the different branches in the field of E-commerce and E-fulfillment. Sub-paragraph 4.4.5 will reveal what developing parties can learn out of these results. Sub-paragraph 4.4.6 discusses the results and their implications and nuance the findings of this research.

As mentioned in the introduction of this research, few sources that describe the most important location factors in (re)location decisions of logistic companies are available. In order to answer this sub-question the factors that are mentioned in literature will be reviewed. Afterwards the answers of the experts will be used as cross-check. It must be noted, however, that most literature examines location factors in (European) Distribution Centers. This type of companies can only be compared to E-fulfillment companies to some extent. Since E-fulfillment companies not necessarily developed out

of distribution centers it cannot be argued that the development of E-commerce has changed the location factors of these companies; since the nature of the activities of these companies differ in their labor intensiveness and their role in the supply chain.

Vereecke et al. (2004) describe many different factors that are being assessed in (re)location decisions. They range from factors regarding the plots of lands and buildings to government regulations and social/economic/political elements. In the case of distribution centers in general and European distribution centers more specifically they concluded from literature reviews that a central location and accessibility are the most important factors. Their own research shows that companies who handle their own logistics prioritize the infrastructural elements, demographic characteristics and availability of plots of lands or buildings (Vereecke et al., 2004).

Warffemius (2007) has stated the importance of transport infrastructure, the distance to sales markets, access to logistics service and know-how, government policy shaping the business climate, the languages that are spoken in the area and the quantity, quality and cost of labor. Van Damme's research (2005) shows why European Distribution Centers chose the Netherlands for their location and shows why they chose the Schiphol Area specifically. According to Van Damme, European Distribution Centers are located in the Netherlands because of its central location in Europe, the presence of logistical know-how, the fiscal climate, transport infrastructure, presence of the main ports (the harbor of Rotterdam and Schiphol Airport) and the language skills of Dutch people. These companies chose the Schiphol location because of its proximity to the hub of flows of goods and people, presence of other companies, the image of the region and the international orientation of the region.

The following location factors can be recognized in some way in all three researches:

- Central location
- Transport infrastructural elements
- Government regulations
- Demographic characteristics

However, other factors were also mentioned in this research, and will therefore also be taken into consideration. This allows for a more complete comparison with the E-fulfillment companies, since in these results the less important or less common factors were also examined.

- Image of the region (van Damme, 2005)
- Presence of other companies (van Damme, 2005)
- Presence of logistical knowhow (van Damme, 2005; Warffemius, 2007)
- Labor costs (Warffemius, 2007)
- Availability of suitable plots of land or buildings (Vereecke et al., 2004)

When connecting these factors to the categories that were presented in the theoretical framework it becomes possible to compare these factors with the results that were gathered from the interviews. The central location is in this case an example of a primary, 'location' factor; this is caused by the strong focus on the relation between centrality and transport costs within these researches (Warffemius, 2007, p. 217; van Damme, 2005, p.26). Accessibility can be seen as a primary, 'location' factor. This accessibility lowers transport costs and is location specific, since the access of the specific location was considered. Government regulations are tertiary, firm-external factors. Demographic characteristics can also be seen as tertiary firm-external factors. The image of the region is an

example of a tertiary, firm-external factor. Firm external since it is not location specific, but rather on a regional scale. The presence of other companies is a secondary firm-external factor, since this should be seen as an agglomeration effect. Presence of logistical know-how is a tertiary, firm-external factor. Labor costs are a primary, firm-external factor. Availability of plots of lands is, as shown earlier a tertiary, firm-external factor.

Table 15: Factors pre E-commerce from literature.

Factors important to (European) Distribution Centers			
Primary 'location' factor	Primary 'location' factor	Tertiary firm-external factor	Tertiary firm-external factor
Tertiary firm-external factor	Secondary firm-external factor	Secondary firm-external factor	Tertiary firm-external factor
Primary firm-external factor	Tertiary firm-external factor		

According to the experts that were interviewed, traditional logistic companies focused strongly on the costs of and accessibility for inbound and outbound flows of goods. Therefore the most important location factors were access to different forms of transport; railway, highway or waterway/harbor. Additionally, these types of companies focused more on their position in between their sales markets and their inbound flows of goods and the transport costs of operating from a given location. The focus in their location strategies is on transporting goods cost efficient. This means that their location should be directly in between their sales market and their incoming flow of goods, for example from the harbor. Availability is also an important factor, especially in traditional logistics; plots of sufficient size are not common. Additionally, these plots should be allowed to have buildings with heights of up to 15 meters. Furthermore, traditional logistic companies look for rectangular sites, as this allows more efficient logistical processes. Additionally, the prices of the sites are important. Traditional logistic companies are aimed more towards companies, and their sole business is transport of goods.

Therefore the most important location factors for traditional logistic companies were:

- The cost-efficiency of transport from their location of both inbound and outbound flows of goods
- Access to different forms of transport
- Availability of plots of sufficient size with the right possibilities regarding height and built form
- Rectangular sites
- Government influences
- Prices of locations

These fit into the following categories:

The cost-efficiency of transport to and from the location is an example of a primary, 'location' factor. The access to different forms of transport is also a primary, 'location' factor. The availability of suitable locations is a tertiary, firm-external factor. The shape of the size does not fit into the categories primary, secondary and tertiary and is therefore an example of an 'other 'location' factor'. Government influences can be seen as a tertiary, firm-external factor. The prices of locations are primary, 'location' factors, since these were not examined on a regional, but rather on a building specific scale.



Table 16: Factors pre E-commerce from experts.

Factors important to logistic companies			
Primary 'location' factor	Primary 'location' factor	Tertiary firm-external factor	Other 'location' factor
Tertiary firm-external factor	Primary 'location' factor		

When comparing the factors that the experts perceived as important (Table 16) with those derived from the literature (Table 15) a couple of issues arise. According to the experts, 'location' factors are more important than firm-external factors. When taking all factors mentioned in the literature into account, firm-external factors are more important according to the literature. However, since the factors all three researches perceived as important reflect a balanced division of 'location' and firm-external factors, it is more likely that the first four factors from the literature reviews are most important. Tertiary factors are most important according to the literature, although, according to the experts primary factors are more important. In the most significant factors derived from the literature primary and tertiary factors are balanced.

In this case the results from the expert interviews will be used to make comparisons with the results of the E-fulfillment sector. The interview experts can be seen as primary data, collected with the aims of this research in mind, therefore it is easier to compare with the other results that were gathered in this research. Additionally, the data that was used in the literature had already been put into categories and has therefore likely lost some of its original depth, specificities and detail. The differences between the data from both sources can be argued to be small; therefore it is not likely to influence the results of this research to great extent.

#### 4.4.2 Present situation

This sub-paragraph tries to answer the question: "Which location preferences have become (more) important due to the rise of E-commerce?"

This sub-paragraph will be structured as follows. The first part of this sub-paragraph will describe the differences in general; it will describe the differences between the categories of factors that are important to the companies that were examined. The second part of this paragraph will look at the details and specificities in order to reveal more nuanced findings.

In order to answer this question we must first examine the way traditional logistical companies assessed their locations. Above you can see the factors most important to traditional logistic companies. The table below (Table 17) recaps the most important location factors for companies in the field of E-fulfillment as well that of traditional logistics.

When looking back at the factors that were perceived to be important by the experts (see Table 17), the difference is mostly that E-tailers look most towards firm external factors. Traditional logistic companies and the logistic service providers in E-fulfillment that were examined in this research focus on 'location' factors. Additionally, these companies look more towards primary factors. Whereas E-tailers put more emphasis on tertiary factors, however, the differences in this regard are small. Furthermore, whereas secondary location factors were not deemed important to the

traditional logistic companies by the experts, this type of factor was more important to logistic service providers and E-tailers.

Table 17: Importance of factors in location decisions.<sup>4</sup>

E-tailers		Logistic service providers		Traditional logistics	
Type of factor	Nature of the factor	Type of factor	Nature of the factor	Type of factor	Nature of the factor
Primary: 7	Firm-external: 13	Primary: 9	Firm-external: 9	Primary: 3	Firm-external: 2
Secondary: 3	'location': 10	Secondary: 5	'location': 18	Secondary: 0	'location': 4
Tertiary: 8	Firm-internal: 1	Tertiary: 7	Firm-internal: 0	Tertiary: 2	Firm-internal: 0
Other: 6		Other: 6		Other:1	

An important difference between E-fulfillment location factors and more traditional location factors in logistics is the higher importance of outbound flows of goods. Whereas in traditional logistics factors such related to inbound flows of products such as accessibility to certain kinds of transport such as railways and waterways are important, in the field of E-fulfillment the connection to the customer and/or parcel delivery hubs are more important, thereby mostly neglecting the role of inbound flows of products. This can be explained by the different position inside the supply chain and by the way E-tailers conduct business. Most of the E-tailers in this research receive their products from wholesalers or suppliers within the Netherlands in small amounts, whereas traditional logistic companies receive their products from locations over the world in bulk. This explains the importance of inbound flows of goods to some extent, because the amount of goods requires different forms of transport and the distance requires adequate organization. Furthermore, most of the E-tailers do not pay for inbound transport directly. They pay for inbound transport through the overall prices they pay to their suppliers and calculate these costs to their customers. This strong focus on outbound flows of goods directs these companies towards locations near transport hubs of parcel deliverers.

However, this stronger focus on outbound flows of goods is less evident in the case of the companies in the field of E-commerce and E-fulfillment that are aimed towards the European market. The companies that were examined in this research also incorporate distance to the harbors in their location decision. This is mostly because they receive their products directly from locations overseas, whereas the nationally oriented companies receive them from locations within the countries.

Additionally, the companies that were examined in this research revealed the importance of the labor markets. Companies in the field of E-commerce and E-fulfillment are likely to need more labor power in their vicinity because, in contrast to more traditional logistic companies, they are more involved in Value Added Services and therefore in more labor intensive activities. Not only is the amount of labor more important, the flexibility of the labor pool in the region has also gained in importance. Companies in the field of E-commerce and E-fulfillment are active at irregular times, and therefore they need flexible employees. Moreover, this also means that locations have to be accessible to (potential) employees.

<sup>4</sup> The numbers indicate the amount of times this category has been mentioned during the interviews

Possibly due to the relatively infancy of the field of E-commerce and E-fulfillment historical motives and regional ties play an important role in (re)location decisions of these companies. Companies search for locations in their neighborhood; this means that sunk costs are important in their decisions.

Direct availability is also more important for companies in the field of E-commerce and E-fulfillment than in more traditional logistic companies. Whereas more traditional logistics companies look at the availability of plots where they can create or operate their business with their specific needs, the E-tailers often had no specific needs and required a new location directly due to the strong growth of their trade volume. This is mainly because the E-fulfillment sector is growing.

Castelein (2012) has reported the following changes in location factor; the higher importance of proximity of parcel delivery hubs, a good local labor market and inside the sales market. Castelein's research has also shows that, E-fulfillment companies have lesser need for multi-modal transport facilities. These conclusions are underlined by this research, although the internationally oriented companies reported the proximity to the harbor as being an important factor; therefore these companies are the exception.

Additionally, Castelein's research has revealed several building specific location factors becoming more important. In his research Castelein has shown that E-fulfillment distribution centers have more and different requirements to their buildings than traditional logistic companies (2012, p. 57). Although these are highly logical when considering the increased amount of labor inside the buildings, most of these factors have not been reported by the companies that were examined in this research. Especially the E-tailers that were interviewed in this research reported little building specific requirements. This means that the role of building specific requirements in the interviews has not been examined enough.

#### *4.4.3 Difference between sub-sectors*

This sub-paragraph tries to answer the question: "What are the differences between different sub-sectors in E-commerce?"

As shown above, there are many differences between companies in the E-fulfillment sector (see table 17). However, these differences do not only exist between E-tailers and logistics service providers. It is important to realize that there are many small differences between different sub-sectors in E-commerce (see Table 18). The field of E-commerce is diffuse and not yet completely matured. This also means that structural differences or similarities cannot be found by using just seven respondents. However, this research could reveal some basic differences between the companies and their origins. The differences between these companies and the origins of these differences are explained below.

For E-tailers the nature of their product, and therefore their target customer group, and the volume-value ratio of their product are key aspects affecting their location decisions. The nature of their product, and following this, the demands of the customers due to the criticality of the product, require some companies to be nearer to parcel delivery companies than others; in that sense ascribing more importance to the distance to these hubs or depots. Additionally, because the fashion

E-tailer has a shallow but very broad stock in its warehouse, they need more floor surface with many pick locations. In contrast, the consumer electronics company looked for height for their warehouse handling bigger items, because their items can be stacked easily.

The volume-value ratio of the product affects the distance between the distribution center and the consumers. If, as was the case for the specialized logistic service provider, the volume-value ratio is unpractical distribution locations are nearer to the consumers, in order to cut transport costs to a minimum. With unpractical volume-value ratio's the transport costs of individual items is often higher. This can be seen in both the food-sector and in the case of the specialized logistic service provider. Additionally, the food sector has higher transport costs due to the conditioning of the items during transport. The Pups that are used in the food sector follow retail like patterns, because accessibility and large flows of people are important.

To most companies the role of the labor market was important, although one company mentioned more aspects of the labor market than the other. However, this does mean that these companies share their prioritization of labor market factors. The pricing level of buildings also seems to be an important factor to most of the companies active in E-fulfillment. However, in some cases this meant the prices of a region, and in other cases this meant the prices of specific buildings. This leads to a different classification, since the price of a building is location specific and thus a 'location' factor and the prices in a region depend on the economic structure and are therefore firm-external. Another similarity is that most companies (four out of seven) have reported or shown a tendency to move in the vicinity of their previous location. Furthermore, three of the E-tailers that were examined reported the importance of expansion capacity.

Table 18: Differences in location factors between sub-sectors in E-fulfillment. <sup>5</sup>

Consumer electronics	Miscellaneous national	Fashion	Miscellaneous international	Nationally oriented service provider	Internationally oriented service provider	Specialized service provider
Primary firm-external factor: 2	Tertiary firm-external factor: 1	Primary firm-external factor: 2	Primary 'location' factor: 1	Primary 'location' factor: 1	Primary 'location' factor: 2	Primary 'location' factor: 2
Secondary 'location' factor: 1	Tertiary firm-internal factor: 1	Tertiary firm-external factor: 3	Primary firm-external factor: 2	Primary firm-external factor: 1	Primary firm-external factor: 3	
Tertiary firm-external factor: 1		Other 'location' factor: 3	Secondary 'location' factor: 2	Secondary 'location' factor: 2	Secondary 'location' factor: 1	Secondary 'location' factor: 2
Other 'location' factor: 2			Tertiary firm-external factor: 2	Tertiary 'location' factor: 1	Tertiary 'location' factor: 1	
			Other 'location' factor: 2	Tertiary firm-external factor: 1	Tertiary firm-external factor: 2	Tertiary firm-external factor: 2
				Other 'location' factor: 3		Other 'location' factor: 3

<sup>5</sup> The numbers indicate the amount of times this category has been mentioned during the interviews

#### *4.4.4 Future developments*

This sub-paragraph tries to answer the question: "What are likely developments in the future and what do these developments mean for future location decisions and –preferences?"

There are three important developments that are likely to be realized in the foreseeable future in E-commerce and E-fulfillment. First there is the development that the sector is becoming more cross-border. Secondly, the warehousing and Value Added Services in the sector are becoming more automatized and mechanized processes. Lastly, the amount of direct deliveries from producers will rise, although not to significant amount of the total E-commerce market. Of these three developments, two are going to affect the location decisions and preferences that companies in the field of E-commerce and E-fulfillment have. These two, the development towards cross-border E-commerce and the mechanization process, will probably change the way in which companies in E-fulfillment choose their location. The first, because, as shown earlier the internationally oriented companies take into account aspects such as government regulations, their inbound flow of goods and differences between labor markets between countries. The second, because the amount of labor that is necessary will likely drop in the future. Although the amount of labor that is necessary will likely still be higher than the amount of labor required in more traditional logistic companies. This does however mean that access to labor pool will become less important for companies in E-fulfillment and E-commerce.

The last development will change the location factors that are important to producers. These producers cannot be seen as part of the field of E-commerce and E-fulfillment completely, although they are connected. These producers will probably take the location of consumer into consideration in the future, and not just their customers.

## 5 Conclusion

### 5.1 Conclusions

In order to come to a conclusion in this research this paragraph will first look back at the hypothesis. Afterwards the individual sub-questions will be answered swiftly. Concluding this paragraph will be the answer to the main question.

#### 5.1.1. The hypothesis

The hypothesis was split up into different parts to assess the accurateness of these parts individually. The hypothesis was that:

*“E-commerce has influenced (re)location decisions made in logistic companies through changing the preferences in firm external- and location factors.”* This part of the hypothesis is partially true. The companies active in the field of E-fulfillment that were examined in this research regard other location factors important than traditional logistic companies. However, whether this is truly caused by the development of E-commerce or due to their different positions in the supply chain is debatable. The table below recaps the differences that exist between the companies that were examined and the factors for traditional logistic companies that were described by the experts.

Table 19: Importance of factors in location decisions (recap)<sup>6</sup>

E-tailers		Logistic service providers		Traditional logistics	
Type of factor	Nature of the factor	Type of factor	Nature of the factor	Type of factor	Nature of the factor
Primary: 7	Firm-external: 13	Primary: 9	Firm-external: 9	Primary: 3	Firm-external: 2
Secondary: 3	‘location’: 11	Secondary: 5	‘location’: 18	Secondary: 0	‘location’: 4
Tertiary: 8	Firm-internal: 1	Tertiary: 7	Firm-internal: 0	Tertiary: 2	Firm-internal: 0
Other: 7		Other: 6		Other:1	

The rise in importance of the labor market as well as the bigger importance of outbound flows of products can be seen as differences in firm external factors. The higher importance of outbound flows and connections to the next company inside the supply chain caused the rise in importance of secondary factors. Whereas in traditional logistics these were mainly driven by transport costs, in E-fulfillment proximity to suppliers and service providers means greater flexibility. Additionally, the developments in E-commerce have shaped the significance of ‘location’ factors such as the lesser importance of building specific requirements and the higher importance distances to suppliers and markets. Although of course this was mostly the case in E-tailers and not in logistic service providers.

The hypothesis also stated that: *“In addition to this, the way the distribution network is organized also directs the changes that occur due to E-commerce.”* This part of the hypothesis was accurate; the role the companies played within the distribution network as well as the organization of the distribution network was an important factor that shaped the location factors of the companies examined. The differences that arise out of the organization of the distribution network can be seen primarily through the differences between E-tailers and logistic service providers; both these types of

<sup>6</sup> The numbers indicate the amount of times this category has been mentioned during the interviews

companies have different positions inside the distribution network and their distribution networks are therefore organized differently. The differences that arise between these two types of companies are that E-tailers look more towards firm-external and tertiary factors than the traditional logistic companies and the logistic service providers (see Table 19). Logistic service providers mainly differ from traditional logistic companies by the importance they ascribe to secondary and 'other' factors such as proximity to sales markets, suppliers and service providers (secondary) and location specific factors.

Additionally, the hypothesis indicated that: *"The way return shipments of goods are handled will also play a role in the physical distribution networks and therefore in the location preferences and the way (re)location decisions are made."* Especially for internationally oriented firms this part is correct; the company on the European market has to adapt its location strategy to accommodate consumers to return their products in their own country, due to regulations. However, for the nationally oriented companies the handling of return shipments only affected the amount of floor surface that was needed for return shipments. The way return shipments are handled and the amount of return shipments the companies receive is related to their business strategy, a firm-internal factor.

Further the hypothesis argued *"that different sub-sectors related to E-commerce have different location needs and –preferences"*. This part of the hypothesis can be called true. The nature of the differences between the sub-sectors in companies that were examined arises out of the characteristics of the products they sell and distribute, as shown earlier. These effects therefore stem from firm internal factors.

### 5.1.2 Sub-questions

#### Pre E-commerce

According to the experts, the most important location factors during the phase before the development of E-commerce were: Primary 'location' factors (3), Tertiary firm-external factors (2) and one other 'location' factor. This particularly reveals their focus on primary factors and 'location' factors.

#### Changes in location factors

As shown in the previous chapter (Chapter 4) tertiary firm-external factors (12) and other 'location' factors (12) are most important to companies inside the field of E-fulfillment. Additionally, it was shown that secondary factors have become more important due to the greater need for speed and flexibility inside the supply chain. Firm-external factors have become more important due to the higher importance of labor markets, direct availability of plots or buildings and the greater importance of outbound flows.

#### Differences between sub-sectors

The logistic service providers that were examined have been shown to have similar location preferences as more traditional logistic companies. The E-tailers differ from these groups to great extent. In E-tailers tertiary factors and firm-external factors are more important, whereas in the

other two groups primary and location specific factors were more important. However, in both the E-tailers and the logistic service providers that were examined there was a higher importance of 'other' location specific factors.

Additionally, there are also differences between the E-tailers that were examined. These differences can mostly be explained through differences in the characteristics of their products and their customers. For example, the company selling fashion required more floor surface, and the consumer electronics company required height. This was because of the amount of individual products they sell. Moreover, the consumer electronics company and the company selling animal products require proximity to logistic service providers, because it was argued that their products were either more critical to the customers or the customers themselves were more demanding in regards to delivery time. The differences between the companies were big enough to indicate structural differences between the different sub-sectors, however, the research design did not allow examining this in a broader way.

#### Future developments

There are three developments going on in the field of E-fulfillment. The first is internationalization. When considering the E-tailers in this research, the internationally oriented retailer has assessed much more factors than the nationally oriented retailers. This could mean that the amount of factors that are being assessed will rise in the future. The second development is the automation processes that are likely to occur. These will reduce the importance of labor market factors, however, these will likely still be more important than in traditional logistics. The last development is the higher amount of products shipped directly from the producers, this will only change the location factors of the producers, making their sales markets more important to them.

#### *5.1.3 Main question*

The main question of this research was: "What changes have arisen out of the ongoing development of E-commerce and E-fulfillment in the (re)location decisions and preferences of companies in the logistics sector?"

As shown in Table 19 there is no straightforward answer that can be given to this question. First of all it is hard to argue that the differences in the location factors between E-tailers and traditional logistic companies have arisen out of E-commerce. This can be argued more easily in the case of logistic service providers. In the case of the logistic service providers, who are generally more similar to the traditional logistic companies or like in two of these cases even have more traditional logistic activities, secondary location factors have gained importance. This is mainly due to the need for greater flexibility that is brought about by the change in customers they have. Traditional logistics has generally been business to business oriented; these customers generally allow a longer delivery time. The focus on consumers brought about by E-commerce has shortened the delivery times; and therefore increased the importance of flexibility. It is important to note that this research has focused on Business to Consumer E-fulfillment. Focusing on other forms of E-fulfillment would possibly have yielded other results in this regard.



Additionally, the higher amount of single orders and packaging that has come out of the development of E-commerce has created Value Added Logistics and Value Added Services; therefore companies that are active in E-fulfillment have more labor intensive processes. Although previous research has shown that this increases the amount of buildings specific requirements, and changes the nature of these requirements (Castelein, 2012), this research has not shown any structural changes in these building specific factors. There was an increase in the category 'other 'location' factors' that were building specific, however, the specificities of the factors inside these categories revealed very different requirements between the companies.

## 5.2 Discussion

This research has aimed to answer its main question by investigating several companies in the field of E-commerce and E-fulfillment. Although the results might have been better if the interviews were conducted more profoundly (see paragraph 3.6), overall the results provide some important insights into the location factors companies in the field of E-commerce and E-fulfillment take into consideration. It was hard to make a clear comparison between the traditional logistic companies and the companies in E-commerce, due to their different roles in overall supply chains and the differences between their activities.

The most important results have arisen out of the comparison between different sub-sectors in the field of E-fulfillment. This was therefore one of the strengths of this research. These results should not be used to generalize to broader populations of companies, although to some extent elements were seemingly generalized during the concluding paragraphs of this chapter, the conclusions only describe the companies that were examined.

Furthermore, it is important to reflect on the data analysis and the classification that have been used for this chapter. Grounded Theory was used in order to generate a new theory. However, since most of the factors mentioned during the interviews were in agreement with the existing theories, classifications and categorizations of these theories were used instead. Therefore the coding process has been conducted in a swift and simple manner. This does however mean, that the analysis of the data has not been conducted as systematically and open-minded as Grounded Theory is usually used. The sensitivity of the research method towards new insights and new findings has yielded little result in this research, and might have even harmed the results from the interviews (see chapter 3.6). However, this does not mean that this research has provided no results whatsoever.

The choice was made in this research to prefer primary data over secondary data when looking at the pre E-commerce phase. Although the secondary data was gathered to describe the location factors of (European) Distribution Centers specifically, because the original data of these researches cannot be examined this data cannot be compared with the data of this research. Additionally, the secondary data has likely lost detail, specificities and depth. In addition the other researches only describe the factors that are important to (European) Distribution Centers, whereas the experts were likely to describe the logistics sector in a broader sense. Therefore this information is more comparable to the other results of this research. However, it would have, of course, been preferable that both sources show the same results.

The role of return shipments in building requirements was not examined in depth in this research, since early on in the research it has become clear that the amount and therefore the impact of the return shipments depend strongly on the business strategy of the company. However, it was important to note that for internationally oriented companies return shipments play a role due to government regulations.

Initially this research also aimed at generating recommendations for the development of buildings that cater to the need of E-fulfillment companies. However, the questions and information gathered on the development of buildings have been taken out of this research. This was mainly due to the lack of information that has been gathered on this topic; therefore it was not possible to come to useful conclusions on this subject. The recommendations were extremely uncertain, due to the necessary acknowledgement of, and sensitivity towards the large differences between individual companies and sub-sectors in the field of E-commerce. Removing these recommendations from this research has however made the societal relevance of this research, which already lacked somewhat, smaller.

Additionally, it was hard to compare traditional logistics with E-fulfillment since very little literature can be found on the location preferences of traditional logistics company (Eurofound, 2008). This means that the research strategy should have been set-up differently. The research strategy could have been improved by also gathering primary data on the location factors that shape the (re)location decisions of traditional logistic companies. By doing this, comparisons between the two types of companies could have been made more systematically. Moreover, this would also take away concerns about the validity of the information on traditional logistic companies as discussed in chapter 4.

Moreover, a key weakness in this research is the comparison of generalizations of factors from traditional logistics with the more detailed and higher amount of factors that have been collected on the companies in the field of E-fulfillment. It is unsure whether the factors that were important to traditional logistic companies have been mentioned exhaustively by the experts, and whether collecting more information on traditional logistics would have led to other results. However, generalizing the data that was collected on the companies in the field of E-fulfillment was not an option, since the attention to detail and specificities was an important aspect of this research.

Another weakness in this research is regarding the causality of the development of E-commerce in changing location factors. As shown earlier, the main differences lie between the E-tailers and traditional logistic companies; whereas the logistic service providers show location factors similar to traditional logistics. It cannot be concluded that the development of E-commerce has changed the factors that are important to these companies, since the companies that were compared are not completely similar.

### *5.2.1 Contributions*

This research also has potential contributions to both scientific knowledge about (re)location decisions of E-fulfillment companies and the practice surrounding this subject. By mapping and categorizing the factors that are important to different kind of actors in the field of E-fulfillment and

connecting these factors to historical trends the understanding of (re)location decisions in E-fulfillment has become more nuanced and thorough. By categorizing the factors that were important to the different actors these factors could be compared with the factors of other companies. Additionally, the role of firm-internal factors was examined; this had led to a more profound understanding of differences in location factors between the sub-sectors of the field of E-fulfillment. This contributes to practice by revealing the importance of firm-internal factors to shaping the (re)location preferences and –decisions, and the differences between the sub-sectors. This knowledge can be used by developing parties and regional governments to attract certain types of companies. Additionally, the importance of direct availability has been shown, as well as the importance of regional ties for companies in E-fulfillment. This provides grasping points for attracting and/or retaining E-fulfillment in a certain region. It is important for developing parties to examine the specific needs of the companies they wish to attract, however, it is perhaps more important to offer flexibility, since contracts are mostly short term.

### 5.3 Recommendations for future research

For future research it could be useful to use quantitative methods, this would allow for more systematic comparisons between the differences in the different sub-sectors of E-fulfillment. This research has shown that there are differences between companies handling different kinds of products, quantitative research can reveal whether these differences are structural or if they depend on firm-internal factors such as business strategy or are merely coincidental. The results of this research give indication that these differences are structural, and depend strongly on the characteristics of the products the companies handle. However, due to the method that is used in this research these findings cannot be generalized to a broader population of companies. The same goes for the differences between traditional logistics and E-fulfillment logistics, the results of this research possibly indicate that, especially for E-tailers that organize their logistics internally, location factors are different for companies in the field of E-fulfillment. However, this research cannot generalize these findings. Systematical comparison, conducted through quantitative research could reveal whether these differences are structural.

Several grasping points for future research can be acknowledged. The first is the role of characteristics of the products. By examining more actors in the same sub-sectors of E-fulfillment, for instance multiple fashion E-tailers and multiple consumer electronics E-tailers, the extent to which product characteristics influence location preferences can be examined more thoroughly. Additionally, by examining more logistic service providers and E-tailers the role of the position within the supply chain can be examined more thoroughly. Research aimed at revealing the importance of the position within the supply chain should also address the organization of the distribution network more in-depth. Lastly the other forms of E-commerce could be researched by examining the location preferences of Business to Business and Consumer to Consumer E-commerce companies qualitatively.

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## Supplements

The supplements that are added below do not reflect the manner in which the data was used completely. The usefulness of these supplements is diminished by somewhat unsystematically conducted data analysis. The supplements might have been more conclusive if code lists with the groups of codes and their connections were provided or, even better, if lists of codes per interview were provided. This was, however, unworkable. The first supplement shows the complete list of codes from the hermeneutical unit, albeit without their groundation (times mentioned) or density (connectedness). The second supplement shows the list of codes categorized as location factors and their groundation, the amount of times these were mentioned. The third supplement shows the categories of factors and their density. In this case this means the amount of different location factors in this group. The hermeneutical unit, interview transcripts and interview recordings are added digitally.

### Supplement 1: Code list Atlas.ti

The list below shows the codes that have been used in the data analysis in Atlas.ti. It must be noted that these are not only the location factors, but also the intermediary factors. Coding the intermediary factors and other aspects such as creating groups of codes was not done consistently during the data analysis of all interviews. Additionally, these codes were only used in the analysis of the interviews with the companies. The expert interviews were analyzed in a different hermeneutical unit. The output comes directly from Atlas.ti.

#### Code-Filter: All

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Organizatie distributienetwerk  
Afstand tot koeriers  
Logistieke proces  
Karakteristieken product  
Locatiefactor  
Afstand tot afzetmarkt  
Beschikbaarheid Ruimte  
Bedrijfstrategie  
Grondkosten  
Levertijden  
pandinrichting  
Vloeroppervlak  
Certificering  
Cut-off tijd  
Transportkosten  
Beveiligingsmaatregelen  
Historische band met regio  
Arbeid aanwezig  
Arbeidsmarkt  
Flexibiliteit van arbeid  
Kwaliteit personeel  
Eisen aan locatie  
Uitbreidingsmogelijkheden  
Flexibiliteit

Hoogte pand  
Value Added Services  
Loading docks  
Regionaal  
Logistiek dienstverleners  
Centraal  
Nieuw warehouse  
Afstand tot transportmogelijkheden  
Sunk costs  
Type aanlevering  
Historische factor  
Regulering  
Verbindingen in distributienetwerk  
Retourzendingen  
Hotspot imago  
Gespecialiseerde dienstverlener  
Gespecialiseerde distributiecentra  
Ontsluiting  
Mentaliteit arbeidsmarkt  
Bereikbaarheid voor arbeid  
Kosten  
Direct availability  
Huren  
Outbound  
Overheidsinvloeden  
Infrastructurele aspecten  
Kosten van Pand  
Concurrentie voor personeel  
Geen eisen pandfactoren  
Haven  
Grootte distributiecentrum  
Verschil B2B en B2C  
Klant keuze bieden  
Eisen klant  
Intern beheer  
Arbeidskosten  
Bereikbaarheid  
Bereikbaarheid Openbaar vervoer  
Transportmogelijkheden  
Toeleveranciers  
Soort producten  
Breed assortiment  
other 'location' factor  
Type arbeid  
Criticality product  
Personeel  
Afstand tot klant  
Afstand tot leveranciers  
Wijkt af van andere bedrijven internationaal  
Dropdichtheid  
Duur contract  
Vloerbelasting  
Verschil post order en e-commerce  
automatisering  
Bouwmogelijkheden  
Geautomatiseerd systeem  
Geen eisen vloerbelasting  
Reistijd naar logistiek dienstverlener



Reistijden naar klanten  
representatief gebouw  
Regionaal imago  
Primary 'Location' Factor  
Primary Firm-External factor  
Productiekosten  
Secondary 'location' factor  
Tertiary 'Location' factor  
Tertiary Firm-External factoren  
Toegang tot snelweg  
Sowieso niet kopen  
Secondary Firm-External factor  
Snelheid  
snelweg  
Kleine producten  
Koeriersdiensten  
Magazijn naar productie  
Verhuisd in omgeving  
Inbound  
Inrichting pand  
Karakteristieken markt  
Oriëntatie afzetmarkt  
Personeel al op locatie  
Persoonlijke band  
Oppervlak kavel  
Onbelangrijk  
Manier van levering  
Ontwikkeling E-commerce  
Tertiary Firm-Internal factor  
Karakteristieken Bedrijf

## Supplement 2: Code list location factors family

The figure below shows the number of times the codes categorized as location factors were mentioned during the interviews. It is important to note that prior to the implementation of the categories derived from the literature some forms of groups were already established. Therefore some of the factors in this list are already groups of factors and the original factors are also incorporated in this figure. This makes this figure hard to interpret.

Name	Gro...
✖ Afstand tot koeriers	22
✖ Beschikbaarheid Ruimte	13
✖ Afstand tot afzetmarkt	13
✖ Grondkosten	10
✖ Transportkosten	8
✖ Certificering	8
✖ Vloeroppervlak	8
✖ Uitbreidingsmogelijkheden	7
✖ Kwaliteit personeel	7
✖ Beveiligingsmaatregelen	7
✖ Eisen aan locatie	7
✖ Arbeidsmarkt	7
✖ Arbeid aanwezig	7
✖ Flexibiliteit van arbeid	7
✖ Hoogte pand	6
✖ Flexibiliteit	6
✖ Afstand tot transportmogelijkheden	5
✖ Loading docks	5
✖ Centraal	5
✖ Regulering	4
✖ Overheidsinvloeden	3
✖ Bereikbaarheid voor arbeid	3
✖ Kosten	3
✖ Concurrentie voor personeel	3
✖ Mentaliteit arbeidsmarkt	3
✖ Ontsluiting	3
✖ Direct availability	3
✖ Kosten van Pand	3
✖ Huren	3
✖ Infrastructurele aspecten	3
✖ Toegang tot snelweg	2
✖ Bereikbaarheid Openbaar vervoer	2
✖ Arbeidskosten	2
✖ Haven	2
✖ Bereikbaarheid	2
✖ Transportmogelijkheden	2
✖ Type arbeid	2
✖ Personeel	2
✖ Reistijd naar logistiek dienstverlener	1
✖ Bouwmogelijkheden	1
✖ Duur contract	1
✖ Afstand tot leveranciers	1
✖ representatief gebouw	1
✖ Reistijden naar klanten	1
✖ Afstand tot klant	1
✖ Oppervlak kavel	1
✖ Geautomatiseerd systeem	1
✖ Productiekosten	1

### Supplement 3: Code list categories of factors.

The figure below reveals the density of the categories of factors. It is important to note that this density reflects the amount of factors that are included in this category, and not the amount of times these categories or factors were mentioned during the interviews. It was impracticable to show the amount of times the categories were mentioned through Atlas.ti, therefore these numbers were calculated manually in this research.

