Master Thesis

Last Mile Delivery Dilemma in E-Commerce

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Abstract

E-commerce has been growing in Sweden over the years. It has not only contributed to economy, but also has shaped people’s way of living, especially with the service of home delivery. Consumers enjoy the various choices of products with reasonable prices and the convenience of receiving parcels with a single click on the mouse or by using their phones. Meanwhile, the problem of not-at-home and repeated delivery have caused trouble for both consumers and logistic service providers leading to an increase in delivery cost. Therefore, it takes a lot of cooperation and innovations to come up with solution which will both convenient to customer and 3PL providers, which we call ‘last mile delivery’.

This thesis was written with purpose of evaluating the solutions used to address the not at home problem of last mile in e-Commerce. Moreover, the thesis seeks find out which of these solutions are preferred by customers and the impact of these solution on customers. The thesis focuses on the Swedish customers because they have more experience buying online.

In this thesis we first established a literature review of E-commerce, E-Shoppers preference of last mile delivery, last mile delivery concept, last mile logistics solution (not at home) which we came up with a theoretical framework by examining the impact of last mile delivery. In order to answer the research questions a focus group discussion and nine interviews were carried out focusing mainly on professional and non professional customers in Sweden. The study identified that apart from home delivery, the customers in Sweden mainly use Collection Points in online shopping. Some other delivery methods such as automated locker banks and controlled home access exist but still in early stage. After analyzing the literature review, current solutions and empirical findings, the study concluded with three potential solutions to solve not at home problem. These solutions are - Secured room at residential building to drop parcel, Automated Locker Bank and Collection Points more closer to residential area.
Acknowledgement

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Also, we would like to express our appreciation to all participants who parts in the focus group discussion and interviews without which this thesis would not have been possible. Last, but not least, we are thankful to our families, relatives and friends for the major support and encouragement given to us during this period.

Jinto Lal Das               Victor Dogbeda Fianu

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Abbreviation

B2C Business-to-consumer
DHL Deutsche Post
3PL Third Party Logistics
CEP Courier, Express, and Parcel
1. INTRODUCTION

The introductory chapter describes the background of the study, research problems, research purpose, scope and limitations. The chapter ends with explaining layout of thesis.

1.1 Background

The internet has emerged as an active tool for transactions between businesses and customers in a virtual marketplace. Its emergence as a medium for the business-to-consumer aspect of e-commerce has far-reaching ramifications. Most importantly, it has created opportunities for businesses to reach out to customers in a very direct way and create electronic market (McKinney and Klopping, 2004). At the push of a button, one can sell, buy, and handle a business from a remote location once a smart device is connected to the internet. The proliferation, rapid development and adaptation of the internet as a marketing tool have introduced the concept of “electronic commerce” to market transactions. The definitions of what constitutes e-commerce vary (Ngai and Wat, 2002; Riggins and Rhee, 1998). Kalakota and Whinston (1997), define e-commerce as buying and selling products and information on the internet and other online services. Throughout the world, online shopping has grown exponentially. From the customers’ point of view, e-commerce comes with a number of benefits such as greater product choice, the ability to obtain goods not sold locally, better price comparison, convenience, etc. However, from the business point of view, the solution of delivery is very demanding. Due to the complex and demanding nature of delivery service, e-commerce businesses outsource these services to third party logistics providers. Yang (2014), defined Third Party Logistics(3PL) as a logistics service provider offering a single or several logistics activities to its customers, which is normally on a contract basis. Lim (2000) defines 3PL as an external company responsible for getting the right products to the right place at the right time, and at the right cost.
The proliferation of business-to-consumer (B2C) e-commerce activities implies individual shipment, resulting in an increasing number of trips and kilometers (Taniguchi and Kakimoto, 2004). B2C is selling products and services directly to consumers via the internet by eliminating middlemen, businesses can charge lower prices and achieve higher profits (Anumba and Ruikar, 2002). During the last decade, e-commerce has been growing at a fast rate, and an increasing number of consumers are using business-to-customer (B2C) to purchase goods online and have delivered to them at home. Bowes (2016), estimate that the total volume of shipping worldwide is close to 31 billion parcels per year. This growth has caused and still causes major problems with regards to the last part of the supply chain of such direct delivery to the customer known as the “Last Mile”. The term ‘last mile’ which is a concept in telecommunication, has since been adopted by the logistics sectors to describe the last leg of the supply chain delivery to the consumer at home. According to Esper et al., (2003), the last mile is the final stage in the distribution process in online retailing and is the most challenging parts of the supply chain. In contrast to traditional city distribution, last mile distribution is a complex issue, involving delivery to customers with small daily demands and at different available time schedules.

1.2 Problem Discussion

New challenges arise for logistics as the supply chain has to cope with the increased fragmentation to satisfy the needs of customers. Every day, large amounts of goods are transported via long-haul vehicles, capable of carrying large quantities of freight (Gianessi, Alfandari, Létocart, and Wolfler Calvo, 2015) but inappropriate for delivering packages to individual customers, due to increasing traffic congestion, environmental issues, and small truckloads. Thus, last mile logistics plays an important role in the distribution of goods to the final consumer (Zhou et al., 2017).

As defined earlier, with regards to distribution the “last mile” is said to be the delivery of goods from distribution centers to the home of customers done by 3PL
who are known as carriers. The delivery of parcel takes place by means of a personal delivery through an appropriate carrier to the customer. The courier, express, and parcel services (CEP-services) are known as the carriers.

High competition, a consumer-driven economy, failed delivery issues, reverse logistics and environmental measures taken by policymakers are factors that increase the costs of delivering online orders (Cardenas et al., 2017). The consequence is that last mile delivery is regarded as the most expensive section of goods distribution (Fernie, Sparks, and McKinnon, 2010; Gevaers, Van de Voorde, and Vanelslander, 2014). Gevaers, Voorde, and Vanelslander (2009) argue that apart from last mile distribution being expensive, it is the most polluting, least efficient part of the e-commerce supply chain, and accounts for 13-75% of the total supply cost. The last mile distribution challenge has become the bottleneck of e-commerce (Wang, Zhan, Ruan, & Zhang, 2014).

According to McKinnon et al., (2015), Oliveira et al., (2016) and Muñoz-Villamizar et al., (2017) suggests an increase in urbanization worldwide means higher level of transport activities in relation to cargo distribution and service provision. This has led to social, environmental, and economic impacts, mostly related to traffic congestion, noise, pollutants, greenhouse gas emissions, and greater risk of traffic accidents. In order to reduce these effects, cities needs development and advancement in innovation, especially in relation to new technologies (Björklund and Gustafsson, 2015). The annual logistics cost in last mile delivery is about 70 billion euros and in 2015 it growth rate was 10% (Joers et al., 2016). The pursuit for solution by stakeholders and logistic service providers has led to greater cooperation and integration of their activities by adopting to new technologies and using resources efficiently (Steadieseifi et al., 2014).

Today in addition to economic and legal regulations the biggest problem is that the recipient is often not at home on the day of delivery (Holdorf and Haasis, 2015). Gevaers et al., 2009 also said the high degree of failed deliveries due to not at home problem of home deliveries, implies extra costs, extra kilometers, and carbon
emission. Due to the close link of B2C with 3PL, it is imperative to develop new and innovative delivery methods to reduce the cost, make the last mile more effective and efficient to realize greater customer value. This can only be achieved when 3PL cooperate with customers over the long term and involve them in the delivery process. Through constant communication with the customers the delivery planning can be improved (Holdorf and Haasis, 2015). Normally, the only contact between customers and online retailers is the 3PL service provider, so the delivery options of the 3PL service provider has become critical success factor for E-Commerce orders. Most known 3PL service providers have already provided solutions for the last mile delivery in the B2C sector. These range from simple e-mail notifications of the planned delivery date to a more precise time window for the delivery to automated parcel lockers, local parcel stations and parcel boxes for private customers (Holdorf and Haasis, 2015).

On one hand, these above solutions are responsible for the growing success of the CEP services. However, there are doubts regarding the use of these delivery concepts by parcel services. Because of delivery times between 9am and 5pm, there will be an additional expenditure of time for the customer, if he or she is not around. For this reason the customer has to pick up his or her parcel at the nearest store of the CEP service, which means that the expected time savings through an online order are often invalid or defeated (Holdorf and Haasis, 2015). Allen et al. (2007, pp. 41-49) and Mckinnon and Tallam (2003) identify some solutions to address the not at home problem. These include Reception boxes, Delivery boxes, Controlled home access systems, Collection points and Locker-banks.

Reception box is permanently fixed to a wall outside the customer’s home. Delivery person has access to that box through using key or code to drop the product. Delivery boxes are owned by the retailer or delivery company. Deliver persons transport the delivery boxes, filled with goods and place at customer’s home. In controlled home access systems, delivery persons have access through using keys or password to home or secured area of customers’ home to drop parcel. Collection
points are usually located nearby post office, petrol pump or stationary shops, from where clients can pick up their goods. Locker-banks are reception box units (lockers) and arranged similar to collection points sited in apartment blocks, workplaces, car parks, railway stations etc. Upon arriving any parcel or goods customer are given one-time electronic code to collect goods.

Emerging technologies including, drone delivery, autonomous vehicles, robots, etc, have the potential to improve last mile deliveries. These emerging technologies could lead to a wholly new transportation infrastructure and commercial delivery models (Lee et al., 2017). However, due to the huge investment required for it implementation, the profitability of some these technologies are questionable. Moreover, with regards to implementation, these new technologies could only be successful in developed countries due to its high cost (Joers et al., 2016).

1.3 Research question and Purpose

The purpose of the study is to evaluate solutions used to address the not at home problem of last mile delivery. This study will particularly focus on the key challenge- ‘not at home problem’ and the solutions to meet the challenge. The study provides answers of following questions.

RQ 1- What solutions are used to address the “not at home problem” of last mile delivery?

RQ2- Which of these solutions are preferred by customers?

1.4 Scope and limitations

The study investigates last mile delivery services provides by 3PL companies in Sweden based on customer perspectives. The study mainly focuses on non-perishable or consumer goods which include, low and high-value goods. Low-value goods include DVD’s, clothes, etc and high value products are for example laptops, electronic goods, etc. The study investigated “not at home problem” of last mile
delivery from customers’ perspective and potential the solutions to meet the problem.

1.5 Structure

The thesis is designed and structured to answer the research questions. The thesis begins with an introduction. In introductory chapter background of the study, research problem, research questions, purpose and limitations have been described. In the methodology chapter, detail description of research philosophy, paradigms, data collection and analytical methods have been explained. In chapter three key concepts and theories have been described. Findings of the study will be discussed in chapter four. In the analysis and discussion part, the findings study will further discussed incorporated with literature reviews. Finally in conclusion part will end with a summary of thesis, recommendation and future works.
2. METHODOLOGY

In the methodology chapter, research philosophy, methodological choices, method of data collection and analysis, research design, research quality and ethical issues have been described.

2.1 Research Philosophy

Research philosophy refers to the systems of beliefs and assumptions for development of knowledge in business research (Saunders et al., 2016). According to Burrell and Morgan (see Saunders et al., 2016, pp. 124) there are a number of assumption you will make in every stage of your research. These assumptions include epistemological, ontological and axiological. Per Crotty (1998), the research question, research purpose, the methods you use and how you interpret your findings will eventually shape your understanding based on the assumptions adopted. A careful laid-out set of assumptions will lead to a credible research philosophy, which will support your methodological idea, research strategy and data collection techniques and analysis procedures.

Ontological assumptions is concerned about the nature of reality or social entities which contains views like objectivism and constructionism. For epistemological assumptions concerns the question of what is or should be regarded as acceptable, valid, and legitimate knowledge in a discipline, which contains views including positivism, interpretivism, realism, etc. (Bryman & Bell, 2015; Saunders et al., 2016). Axiological assumption concerns the roles of values and ethics within the research process. This contains question about how researchers deal with their own values and those of their participant in a research study (Saunders et al., 2016). In this study, the authors will discuss four major research philosophy including positivism, interpretivism, pragmatism and realism. Through the discussion and understanding of the philosophies the, one will be chosen to address how we will go about the research question and purpose.
2.1.1 Positivism

As per Bryman and Bell (2015) and Saunders et al., (2016), positivism refers to using the methods of the natural sciences and applying it to study social reality to produce law-like generalization. For positivist, they focus strictly on scientific empiricist method designed to yield pure data and facts not influenced by human interpretation. Positivist researchers might use existing theory to develop hypotheses by testing and confirming these hypotheses in whole or part, or refuting it leading to the further development of theory which may then be tested by further research. According to Crotty (see Saunders et al., 2016, pp. 137) in order for positivist to avoid influencing their findings they try to remain neutral and detached from their research and data. This means positivist researchers undertake research in a value free way and maintain an objective stance. Interpretivism is characterized by in-depth analysis of a small sample size and therefore this paradigms is undertaken for qualitative research (Saunders et al, 2011). Whereas positivism, with limited human interaction is interpreted from objective perspective, which is aimed for explanation rather than interpretation. As a result positivist paradigm is more suited for quantitative research with large sample size.

2.1.2 Realism

Realism relates to the philosophical stance that provides an account of the nature of scientific practice. The two majors types of realism are critical realism and empirical realism. Empirical realism suggests that reality can be understood through the use of appropriate methods. Critical realism acknowledges the reality of the natural order, the events, and discourses of the social world. For critical realist the social world would be understood only if we identify the structures at work that generate those events and discourses. (Bryman & Bell, 2015).

2.1.3 Pragmatism

Pragmatism philosophy states that concepts are only relevant where they support action (Kelemen & Rumens, 2008, see Saunders et al., 2016, pp. 143). For
pragmatism, they are more interested in practical outcomes by considering theories, concepts, ideas, hypotheses and research findings not in an abstract form. From the pragmatist point of view, there are many different ways of undertaking research and interpreting the world. They are of the view that multiple methods are possible and highly appropriate within one study. This does not necessarily mean that pragmatism often use multiple methods but they use methods that enable credible, reliable and relevant data to be collected to advance the research (Kelemen & Rumens, 2008).

2.1.4 Interpretivism

Interpretivism is seen as the alternative or contrasting to positivism. They share the view that social sciences are basically different from that of the naturals sciences. Interpretivism are of the view that that the study of social world requires a different logic of research that shows the distinctiveness of humans as against the natural order (Bryman & Bell, 2015). According to Saunders et al., (2016) interpretivism is subjective with its focus on complexity, multiple interpretations and meaning making. For interpretivist the challenge is to enter the social world of the research participants and understand that world from their point of view. Interpretivist asserts that human beings create meaning because they are different from physical phenomena. For interpretivist research to create new, richer understanding , and interpretations social worlds and context is their main purpose.

2.1.5 Research Paradigm of the Thesis

Interpretive paradigm emphasis on explaining content of the study through integrating human interaction, individual interest, and concerned with the meanings people bring to situations. As the study will analysis customers perspective of “not at home problem of last mile delivery” , through in depth evaluation of the problem, customers expectation, and possible solution, the study will follow interpretive paradigm. The goal of interpretivism, to gain deeper understanding of a
phenomenon. The interpretivist characteristics qualitative research and small sample size (focus group discussion) are part of this research as well.

2.2 Research Approach

Research approach incorporates relevant theories and the study. Therefore researcher has to understand the relationship between theory and research (Bryman and Bell, 2015). Established theories and scientific approach guide researchers to conducting study in right way to get desired outcome. The role of the selected theory could be described in the design of the research. According to Bryman and Bell (2015), mainly there are two types of research approach deductive scientific approach and inductive scientific approach. In the following paragraph these approaches have been described.

2.2.1 Deductive approach

Deductive approach describes the relationship between theory and research. In deductive approach theory and hypotheses come first and drive the process of gathering data. This means that there is a need to spell out how data can be collected in relation to the concepts that make up the hypotheses (Bryman & Bell, 2015). According to Blaike (see Saunders et al., 2016, pp. 146) list six chronological steps through which deductive will progress:

- Put forward an idea, a premise, a hypothesis or set of hypotheses to form theory.
- By using existing literature or by specifying the conditions under which the theory is expected to hold, deduce a testable proposition or number of proposition.
- Examine the premise and the logic of the argument that produce them, comparing this argument with existing theories to see if offers an advance in understanding. If it does, then continue.
● Test the premise by collecting appropriate data to measure the concepts and analysing them.
● If the result of the analysis are not consistent with the premises, the theory is false and must either be rejected or modified and the process restarted.
● If the results of the analysis are consistent with the premises then the theory is corroborated.

2.2.2 Inductive approach

Inductive approach focuses on developing theory and does not require to make hypothesis. With regards to inductive approach, researchers tend to work more likely with qualitative data and use different methods to collect data in order to establish different views of phenomena (Saunders et al., 2016). In inductive research, researchers gather large amount of data through interviews, observation, etc, from a small number of participants and conduct in depth qualitative analysis through incorporating previous literatures and experiences (Creswell, 2014). As per (Saunders et al., 2016), inductive researchers are of the view that the study of small sample of subjects might be more appropriate than a large number as compared to deductive approach. This approach relatively flexible the deductive approach and could be changed during the study.

2.2.3 The research approach followed in the study

This thesis used the deductive approach. Deductive approach normally start with reading literature in relation relations to academic articles and journals, and coming up with research strategy to collect empirical to do analysis based on the theory. The aim of the approach is to develop theory through in depth analysis of empirical data (Saunders et al., 2016). Deductive reasoning follows logical reasoning approach to identify inferences and general principles from specific cases. The study follow deductive approach since the research will start with existing theory as the base but not aim at building theory. Existing theory regarding last mile delivery
solution and E-shoppers preference of last mile delivery has been used as the basis for investigating the research question.

2.3 Research Method

Research method is defined as the general orientation to the conduct of business research (Bryman and Bell, 2015). There different types of business research methods - qualitative, quantitative, and mixed methods. The selection of research methodology is mainly depends on the perception of the worldview of the researchers. In addition, research problem, sources and method of data collection and analysis mainly motivate researchers to select specific research strategy. As discussed earlier, quantitative research strategy is followed by deductive approach, on the other hand qualitative strategy is followed by inductive approach (Creswell, 2014).

2.3.1 Qualitative Research

Qualitative research is a research strategy that is concerned with words rather than collection and analysis of numeric data, which takes an inductive view of establishing relationship between theory and research. In addition, qualitative research stress on the understanding of the social world through an examination of the interpretation of that world by its participants. This view implies that social properties are outcomes of the interactions between individuals, rather than phenomena ‘out there’ and separate from those involved in their construction (Bryman and Bell, 2015).

2.3.2 Quantitative Research

Quantitative research is a research strategy that involves the collection and analysis of numerical data about object, organizations, and people and entails using a deductive approach to establish a relationship between theory and research. (Bryman and Bell, 2015). Quantitative research is largely object oriented analysis with aim to examine hypothesis, whereas researcher do not interact or interfere with
the reality that has been studied. Quantitative research is mainly conducted by applying structured interviews and surveys (Bryman and Bell, 2015).

2.3.3 Research Method followed in the Thesis
The study follows a qualitative approach, in which a large part of the research will be exploratory in nature. A significant amount of data will be collected through focus group sessions and observation from a selected group of people and some specific location e.g. parcel distribution centres. In-depth analysis will be inducted following scientific methodology. During data collection, the authors will directly interact with participants. As said earlier qualitative research is related to the interpretivism philosophy because researchers need to make sense of the subjective and socially constructed meanings about the phenomenon being studied (Denzin & Lincoln 2011, see Saunders et al., 2016, pp. 168)

2.4 Research Design of Questions
Bryman and Bell (2015) state that the framework for the collection and the subsequent analysis of data is determined by the research design. Research design is the blueprint of how the research question would be answered. It contains clear purpose derived from the research questions, how you intend to collect data and analyse it, ethical issues and the constraints you will encounter. According to Saunders et al., (2016, pp. 174-176), research can be designed to fulfill either exploratory, descriptive, explanatory or evaluative purpose or combination of these.

- Exploratory studies is a useful way to ask open questions to discover what is happening and gain deeper understanding about a topic.
- Descriptive studies seek to describe an events or situation.
- Explanatory studies try to find causal relationship between variables.
- Evaluative studies seek to find out how well something works.

The authors have chosen to take an exploratory approach and in some case evaluative approach with the use of qualitative research. As noted exploratory approach is used gain deeper insight of a phenomenon. The reason for choosing
explorative research is because, with the fast growth rate of both e-commerce and express industry, this thesis aims at evaluating solutions preferred by customers for the not at home problem of last mile delivery in Sweden. There are a lot of studies on either e-commerce or last mile delivery problem, however only a few of these studies are carried out from a customer perspective, therefore the authors thinks that there is possibility that new discovery and knowledge can be gained on this topic.

### 2.5 Data Collection method in the study

Primary data will be gathered following three methods- Focus group, interviews, and Observation. Secondary data will be collected through searching in Google Scholar, One Search, relevant journals, report and other available sources.

**Table 1: Data Collection Method**

<table>
<thead>
<tr>
<th>Data collection method</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus Group</td>
<td>Participants will be students of Linnaeus University. The session will be arranged in the library of the university.</td>
</tr>
<tr>
<td>Semi Structured Interview</td>
<td>In Depth semi structured interview will be conducted, The participant will be professionals.</td>
</tr>
<tr>
<td>Observation</td>
<td>Parcel collection and distribution centers at Växjö, and residential areas at Teleborg.</td>
</tr>
<tr>
<td>Secondary data</td>
<td>Reports, Article, books, journals, etc</td>
</tr>
</tbody>
</table>
Table 2: Overview of the Participants

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Occupation</th>
<th>Participating methods</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant A</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant B</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant C</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant D</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant E</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant F</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Participant G</td>
<td>Master Student</td>
<td>Focus Group</td>
<td>Linnaeus University, Vaxjo Campus</td>
</tr>
<tr>
<td>Interviewee one</td>
<td>Executive, Volvo Group</td>
<td>Semi-structured interview</td>
<td>Face to Face Interview</td>
</tr>
<tr>
<td>Interviewee two</td>
<td>IT Professional</td>
<td>Semi-structured interview</td>
<td>Face to Face Interview</td>
</tr>
<tr>
<td>Interviewee three</td>
<td>IT Professional</td>
<td>Semi-structured interview</td>
<td>Interview over Skype</td>
</tr>
<tr>
<td>Interviewee four</td>
<td>Executive, Volvo Group</td>
<td>Semi-structured interview</td>
<td>Interview over phone</td>
</tr>
<tr>
<td>Interviewee five</td>
<td>Distributor</td>
<td>Semi-structured interview</td>
<td>Face to Face Interview</td>
</tr>
</tbody>
</table>
Interviewee six  | Employee in a Swedish Restaurant | Semi-structured interview | Face to Face Interview
---|---|---|---
Interviewee seven  | Retired Mechanical Engineer | Semi-structured interview | Interview over phone
Interviewee eight  |  | Semi-structured interview | Interview over phone
Interviewee nine  | Executive, of IT company | Semi-structured interview | Face to Face Interview

### 2.5.1 Primary Data

Primary data are first hand data collected by researchers during the study through observation, interview, focus group, etc. The focus of primary data collection method in this paper is focus group and observation. Focus group is method of interviewing that involves more than one, usually at least four interviewees (Bryman & Bell, 2015). As per Hutt (1979), focus group technique is seen as a way of helping participants to define a problem and work together to come up with potential solution in business research. In focus group discussion participants are able to bring to bear issues in relation to a topic being discussed. This is particularly relevant in the context of qualitative research, because the viewpoints of the participant being studied are important in relation to the study. It also offers the researcher the opportunity to study ways in which participants collectively make sense of a phenomenon and construct meanings (Bryman & Bell, 2015)

Semi-structured interview with professionals will provide wider view and experience of working people about online shopping and delivery of goods. Nine participants were randomly selected for the interview. Six face to face interviews were taken at Vaxjo and three interviews were take over telephone and skype. A semi structured questionnaire was followed in the interviews.

Observation enables researchers to have experience the real life scenario, which
significantly contributes to understand a particular case. During conducting observation, researchers follow “explicitly formulated rules for the observation and recording of behavior” (Bryman and Bell, 2011, 23 p. 719). These rules provide guidance to observers in collecting and recording data.

2.5.2 Secondary data

Secondary data will be collected through searching in Google Scholar, One Search, relevant journals, report and other available sources. Due to the time limitation and money involved in business research, secondary data is more appropriate in this study. For this study, secondary data will be mostly used for the collection of data on the empiry.

2.6 Data Analysis Method

The key steps of data analysis includes coding, categorizing, summarizing, structuring and conceptualizing, which enables researchers to further analyze empirical findings (Saunders, et al., 2009). The selected Data analysis strategy should be selected based on established scientific theory so that validity and reliability can be ensured (Bryman and Bell, 2011). Lichtman (2013) suggested six steps data analysis. These are:

“Step 1. Initial coding. Going from responses to summary ideas of the responses

Step 2. Revisiting initial coding

Step 3. Developing an initial list of categories

Step 4. Modifying initial list based on additional rereading

Step 5. Revisiting your categories and subcategories

Step 6. Moving from categories to concepts”
2.7 Quality Criteria

When conducting a business research, it is really important to assess the quality of the study. This is done to show how valid and reliable the study is. Some authors have suggested that qualitative studies should be reviewed and evaluated differently based on the used for quantitative research. Three of the main common criteria used to ensure quality are validity, reliability and transferability (Bryman and Bell, 2015).

2.7.1 Validity

Validity is more focused on the integrity of the conclusions that are generated from a piece of research. As per LeCompte and Goetz (1982), there are two ways researchers can look at validity of a study from the internal and external perspective. Internal validity refers to whether or not there is a good a match between researchers’ observations and the theoretical ideas they develop. They argue that the main strength of qualitative research is internal validity. External validity refers to the degree to which findings can be generalized across social settings or beyond the specific research context. LeCompte and Goetz (1982) argue that, external validity represents problem for qualitative researchers because of their tendency to use case studies and small samples.

According to Creswell (2014) and Bryman and Bell (2015) validity in qualitative research can be achieved by triangulation. Triangulation is using more than one method or sources of data in the study of social phenomena. In this study data will
be collected from multiple sources including articles, journals, report, etc and perspectives from participants will add to the validity of the study. Also the authors of this study have knowledge about the topic and therefore will know how to interpret data from different sources and during the focus group discussion.

2.7.2 Reliability

Reliability deals with the question of whether the results of a particular research are repeatable. The term is commonly used in relation to the question of whether or not the measures that are devised for concepts in business and management are consistent. There are two ways researchers can look at reliability of a study, which is from the internal and external perspective (LeCompte and Goetz, 1982). Internal reliability deals with the means whether or not, when there is more than one observer, members of the research team agree about what they see and hear. External reliability has to do with the degree to which a study can be replicated. According to this is a difficult measure to in qualitative research because it is impossible to ‘freeze’ a social setting and the circumstances of an initial study to make it replicable in the sense in which the term is employed. Nevertheless, they recommend several strategies that can be introduced in order to approach the requirements of external reliability. For example, they suggest that a qualitative researcher replicating ethnographic research needs to adopt a similar social role to that adopted by the original researcher.

According to Creswell (see Corbin and Strauss, pp. 343) suggests that asking your colleagues to review your findings is the best way to achieve what Lincoln and Guba (1985) called “credibility” and “trustworthiness”. Therefore, fellow students are asked to conduct a peer review or debriefing of this master thesis in order to improve the quality before completion. In addition, the academic supervisor and tutor will continuously guide and give their input in this master thesis.
2.7.3 Transferability

Transferability which matches external validity refers to the degree in which a result from a study can be generalized and applied in a different place. Qualitative research often involves an intense study of a small group or individuals that have similar characteristics, rather than a broad scope as in quantitative research. That is qualitative findings tend to be orientated to the contextual uniqueness and significance of the aspect of the social setting being studied. Therefore, the result of qualitative research is often connected to the setting in which the study is done (Bryman and Bell 2015, p. 402).

According to Guba and Lincoln (see Bryman and Bell 2015, p. 402) qualitative researchers should provide so called “thick descriptions”, which are detailed descriptions of the study setting. They argue that a thick description provides others with a database for making judgement about the transferability of findings to other settings. In this study the authors will provide a detailed descriptions of the topic and offer many perspectives for the results to become more realistic and richer.

2.8 Ethical consideration

Ethics in business research bring into consideration the role of values in the research process. Ethical issues revolve around concerns such as: how should we treat the people on whom we conduct research, and are there in which we should or not engage in our relations with them (Bryman and Bell, 2015). Discussions about ethical principles in business research often revolve around certain issues that recur in different ways. According to Diener and Crandall (see Bryman and Bell 2015, pp. 134) the four principles are harm to participant, lack of informed consent, invasion of privacy and deception.

The first principle, harm to participants is concerned with the participants’ exposure to potential or real harm in the cause of the research. Harm in this sense can either physical or psychological which is deemed as unacceptable (Bryman & Bell, 2015).
Lack of informed consent could be avoided by giving the research participant as much information as needed in order to make an informed decision about whether or not they wish to participate in a study. The principle of informed consent entails that participant in research should be fully informed about the research process. For example, per the Market Research Society (MRS) code of conduct, informed consent means participants should be told at the beginning of the interview, if observation techniques or recording equipment are to be used. The third ethical concern relate to degree which invasion of privacy can be condoned. The issue of privacy is invariably related to the issues of anonymity and confidentiality in the research process. In this regard anonymity and privacy of those who participate in the research study must be respected. The last principle deception arises when the researchers represent their study as something different from what it is. Ethical concern to deception are based on two point. First, it is not a nice thing to do, second, the question of professional self-interest comes into play (Bryman and Bell, 2015).

2.8.1 Ethical considerations of the paper

In this thesis, all ethical guidelines presented will be followed. Any kind of deception which is not acceptable to obtain the desired data will be avoided in this research. All data gathered will be analyzed and interpreted in a truthful manner to avoid misinterpretation of findings.

Also, participants will be informed about the research and consent will be asked for prior to the recording or publication of obtained data. Participants in the interviews and focus group discussion will be introduced to what the study is about, in order for them to respond in a useful way.
Table 3: Summary of the Methodology

<table>
<thead>
<tr>
<th>Methodology Topic</th>
<th>Methodology Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Philosophy</td>
<td>Interpretivism</td>
</tr>
<tr>
<td>Research Approach</td>
<td>Deductive approach</td>
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<tr>
<td>Research Method</td>
<td>Qualitative method</td>
</tr>
<tr>
<td>Research Design of questions</td>
<td>Exploratory and Evaluative questions</td>
</tr>
<tr>
<td>Data collection method</td>
<td>Secondary and Primary Data (focus group and observation)</td>
</tr>
<tr>
<td>Quality Criteria</td>
<td>Validity, Reliability, and Transferability</td>
</tr>
<tr>
<td>Ethical Consideration</td>
<td>Informed consent</td>
</tr>
</tbody>
</table>

Table 3: summarizes the various the selection made for this thesis.
3. LITERATURE REVIEW

3.1 E-Commerce

The internet has become an important business platform or tool for trading, distributing and selling products between organisations, among businesses and consumers, and even between consumers. It has changed the way companies communicate, how they share information with business partners and how they buy and sell. This has brought e-commerce to an entirely new level (Barnes and Vidgen, 2000; Berners-Lee, 1999). There is no universal accepted definition for e-commerce. Kalakota and Whinston (1997) defined e-commerce based on the following:

- From a communications perspective, e-commerce is the delivery of information, product/services, or payments via telephone lines, computer networks, or any other means.
From a business process perspective, e-commerce is the application of technology toward the automation of business transactions and workflows.

From a service perspective, e-commerce is a tool that addresses the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of service delivery.

From an online perspective, e-commerce provides the capability of buying and selling products and information on the internet and other online services.

All the above definitions are valid but it just a matter of how you view what e-commerce is. For the purpose of this paper, we will adopt the definition of e-commerce from an online perspective which is” e-commerce provides the capability of buying and selling products and information on the internet and other online services.

E-commerce makes it much easier to reach global market for various kinds of goods and services with the flexible communication between producers, suppliers and customers (Egea & Menéndez, 2006). By e-commerce, the company can get benefits such as the reduction of costs, the increase of the potential market and opportunities for the new business (Beck, Wigand, and Konig, 2005; Fink and Disterer, 2006; Grandon & Pearson, 2004). According to Delfmann et al. (2002), e-commerce can be taken up by almost every possible economic relationship such as B2B (business to business), B2C (business to customer), C2C (customer to customer), B2A (business to administration) and C2A (customer to administration). We will focus on B2C (business to customer) in this paper. B2C is selling products and services directly to consumers via the internet by eliminating middlemen, businesses can charge lower prices and achieve higher profits (Anumba and Ruikar, 2002).

The main challenge for businesses is how this product will be delivered to the consumer. E-commerce comes with a number of benefits such as greater product choice, the ability to obtain goods not sold locally, better price comparison and
convenience, from the customers point of view. Consumers buying products online means, this product will have to be delivered to them at home. However, from the business point of view, the solution of delivery is very demanding and needs complex planning. Normally, because of the complex planning and demanding nature of last mile delivery, businesses outsource delivery aspect to third party logistics (3PL) companies.

**Impact of E-commerce on Company**

Success of a business organization largely depends on it customers. For e-commerce company e.g Amazon, the success mainly depends on the number of customers and the frequency of buying products. Advanced web based information and communication technologies have made it possible for e-commerce companies to sell products and services to large number of customers. On the other hand Internet and mobile computing technologies and online banking facilities enable users to buy products from E-commerce company. In Europe online shopping is quite high (about 45%) compared to other part of the world. (Morganti et al., 2014, p.179). It is expected that the growth of online shopping will be much higher in coming days. Although, through using Internet it is now highly convenient to make a purchase but the final step - delivery of physical goods, of buying and selling process, is still most important issues and also a major challenges for e-commerce company. In addition the demand for fast delivery on day or next day delivery is significantly growing. (Morganti et al., 2014). Besides compared to traditional companies, e-commerce firms usually have more return of products (Ramanatha, 2011). Because of these reasons last mile delivery is one of the major cause for losses of many e-commerce company (Punakivi et al., 2001).

Usually e-commerce companies outsource logistics services from 3PL companies e.g. DHL, UPS, Postnord, etc. for delivery of goods to end customers. However, inefficient and ineffective delivery services, delayed and inconvenient delivery process, inconsistency, complex shipment process, lack of information, return policy, transparency, unreliability and insecurity, etc. have direct impact on the sales
as well as the overall success of e-commerce companies. What will happened if the delivery process is complex, slow, and unreliable. What if the customer has bad experience with delivery of goods. The possible answers is customer will not buy products from that e-commerce company. Therefore, e-commerce company has to be very careful in outsourcing last mile logistics services.

3.1.1 E-Shoppers preference of Last mile deliveries

In Europe of the physical product that requires physical distribution, Europe e-shoppers mostly buy fashion (shoes and cloth) and entertainment. European customers’ mostly buy clothes or shoes online (48%) than electronic equipment (31%). One in four have made purchases of the following: CDs or DVDs of music or films (24%), household equipment (23%) and magazines, newspapers, or books (22%). The problem customers experience is mostly related to delivery rather than the products itself (Morganti et al., 2014). According to Eurobarometer (2013, see Morganti et al., 2014), 39% of e-consumers have experienced problems such as: delivery at home when nobody was there (15%); a delay in the delivery (13%); delivery costs that were too high (7%); the lack of a way of tracking delivery status (5%); and the need to collect the product from a distant collection point (3%). However, in Germany customers have different views in relation to the problems of e-commerce. In particular, consumers emphasize negative experiences involving delivery delays (29%) and damaged goods (20%) (BITKOM, 2013).

In Germany as of 2008, there were around 14000 pick-up point (Der Aktionär, 2009; see Morganti et al., 2014 ) and the average distance to a pick-up point in cities is 600m and in rural areas 3km (Packmee, 2014; see Morganti et al., 2014). As per DHL( 2009), 90% of the German population are just 10 minute within locker banks. The second largest network GLS has 5,000 parcel shops in Germany. GLS offers parcel recipients the option of collecting their delivery from their nearest parcel shop if they were not at home when the first delivery attempt. According to Morganti et al., (2014), although Germany has quite a dense pick-up point network,
90% of the customers still prefer home delivery while 4% of them prefer to have their parcels delivered to locker banks.

In France, the pickup point rose from 10,900 in 2008 to 18,200 in 2012, representing a 67% increase. According to Morganti et al., (2014) locker banks presence is limited in France and La Poste under the name of Cityssimo, operate 33 kiosks. Due to security regulations in France, i.e. the Vigipirate antiterrorism measures, which prohibit leaving of unattended parcels in automated lockers, the presence of locker banks is limited. The law has recently been revised and automated parcel stations are now allowed in certain areas. However, pickup point network is widespread in France which include four competing operators namely Mondial Relay, Kiala, Relais Colis and Pickup Services. The network has developed standardized delivery solutions for the whole country and in 2013 each of the networks provided access to a pickup point in less than 10 minutes by car or on foot (depending on the area) to 90% of the French population. More than 20% of delivery is done through pickup point instead of home in France today. As per Morganti et al., (2014), pickup points is a well-established alternative to home delivery in France at the national level, due to their presence coverage in urban, suburban, and rural areas.

However, delivery of packages in the United Kingdom differs from France and Germany. The majority of online shoppers in the UK have been using click and collect in the last 12 months. A research conducted by Barclays show that 19.1% used click and collect. In France 9.5% used click and collect whiles in Germany its 8.4% of consumer surveyed. In France picking up in collection points is much more desirable, as 55.8% of the consumers used this option in the last 12 months. In United Kingdom (2.2%) and Germany (12.8%) this option is significantly less popular. With the available solutions customers in UK, France, and Germany still prefer home delivery with 94.9%, 79.6 % and 87.2 % respectively(Barclays, 2014).
3.2 The concept of Third Party Logistics (3PL)

According to Yang (2014), 3PL also referred to as third party logistics has many definitions and there is no standard definition that seems to satisfy academic researchers. We give some definition of 3PL as follows.

Stank and Maltz (1996) refers to 3PL as any firm that provides a service that it does not own. Berglund et al., (1999) defined 3PL as a logistics service company providing service on behalf of a shipper responsible for the management, transportation, and warehousing of goods. Another definition describes 3PL as an external organization that performs all or part of a producer’s or customer’s logistics function (Coyle et al.,2003). Per Bagchi and Virum (1996), 3PL is said to be a long-term partner of a shipper that offers a number of logistics activities for the shipper.

In this paper we adopt the definition of (Hertz and Alfredsson, 2003), who describes 3PL as an external provider who manages, control, and deliver logistics services to customers on behalf of a business or supplier.

Owing to the complex and demanding nature of after sales service, namely logistics service, e-commerce companies outsource these services to third party logistics company. By outsourcing e-commerce businesses can focus on their main mandate, which is selling of products and gaining competitive advantage. Wilding and Juriado (2004), argues that the main reasons of outsourcing logistics services to third party logistics company are categorised into five part, namely cost or revenue related, service related, operational flexibility related, business focus related, and asset utilization or efficiency related.

Cost or revenue related is the most important reason why e-commerce businesses outsource according to (Wilding and Juriado, 2004). Logistics activities need heavy investment in Information Technology support and hardware in which third party logistics companies can provide. Therefore, by outsourcing, e-commerce businesses can avoid the heavy cost of investment and operation in IT and hardware. Lacity and Hirscheim (1995), argue that a decrease of 10 to 20% cost can be achieved.
3.3 The Concept of Last mile delivery

The term ‘last mile’ which is a concept in telecommunication, originally referred to the difficulties faced by telecommunications providers in connecting homes to the local network hub, but has since been adopted by the logistic sector to describe the last leg of the supply chain: delivery to the consumer at home (ORTEC). This last leg is often the least efficient link in the supply chain, comprising up to 75 per cent of the total cost of the delivery (Gevaers et al., 2009). Last mile is defined as the final stage in the distribution process in online retailing and is one of the most challenging parts of the supply chain (Esper et al., 2003). That is, last mile delivery, is about delivering a product to final consumer mostly at their doorstep and it the only stage that has direct contact with the customers.

A proposed working definition of last mile is given Lim et al., (not dated, pp.1):“Last-mile logistics is the last stretch of a business-to-consumer (B2C) parcel. It takes place from the order penetration point (i.e., fulfilment centre) to the final consignee’s preferred destination point (e.g., home or cluster/collection point), for reception of goods.” To Lindner (2011, cited by Ewedairo et al., 2015), last mile refers to a string of activities and methods that are required for the delivery process from distribution point to the final consumer.

Nonetheless, these definitions are geographically deficient because they do not take the whole urban area into consideration. For example the last transit point may be sited within an urban area which is often predefined by the institution. The same may be applied for collection point due to the fact that the customer may use a vehicle for the pick-up of a good. In this case the driving distance between the customers destination and collection point also causes negative impacts to the urban area, which institutions tries to avoid. Thus, the definition has to include the whole urban area, which is predefined by the institution, including the upstream logistics to the transit point, the pick-up distance for the customer and collection point. Hence, a summarized definition of “last mile” logistics is proposed Wohlrab et al., (2012):
“Last mile logistics is the last part of a B2C delivery process. It takes place within a predefined delivery area (e.g. urban area); including the upstream logistics to the last transit point until the destination point of the parcel. It involves a series of activities and processes, of critical value to all the involved stakeholders (e.g. Customer, Industry and Institution) within the delivery area.”

One of the main characteristics of the ‘last mile’ that distinguishes it from other transportation services is the home delivery aspect, which requires sole contact between the supplier and consumer. The person delivering the goods is the representative of not just the company they work for, but for all the companies that have contributed along the supply chain and this requires a professional and customer service oriented approach to delivery (ORTEC). Consoli (2016), found that, the main drivers for e-commerce for the customer are: time saving, economic benefits, and different choices. These include, greater product choice, the ability to obtain goods not sold locally, better price comparison and convenience, etc. Consumers buying products online means, this product will have to be delivered to them at home.

The main challenge for businesses is how this product will be delivered to the consumer. From the business point of view, the solution of delivery is very demanding and needs complex planning. Normally, because of the complex planning and demanding nature of last mile delivery, businesses outsource delivery aspect to third party logistics (3PL) companies.

Today the biggest problem in addition to economic and legal regulations is that the recipient is often not at home at the day of delivery (Holdorf and Haasis, 2015). For home deliveries, the high degree of failed deliveries due to the “not-at-home” problem implies extra costs and extra kilometres and carbon emissions (Gevaers et al., 2009). This is because the parcel may have to be presented two or three times before it is successfully delivered.
The initial starting point of last mile delivery is a retail warehouse or an eShop fulfilment centre. There are several ways by which goods reach the final customer. From the eShop fulfilment centre either own vehicles or 3PL service providers are used. Normally goods are taken to a regional distribution centre before the final delivery leg is carried out. Deliveries can also be made through a retail outlet store from a retail distribution centre either own vehicles or 3PL. if the delivery is to a locker bank or collection the customer will have to travel to this location to collect their parcel.

### 3.4 Last mile logistics solution

For the purpose of this paper, we will focus on some logistics solution of the not at home problem of last mile delivery as stated in our research question and purpose. Logistics companies have designed different last mile delivery solution to address the problem of failed deliveries and the high costs of failed attended home deliveries, often associated with the not at home problem. Unattended delivery solution at the customers home include the of reception box, delivery box, and controlled access system, whiles away from the customer’s home include collection and locker banks (Allen et al. 2007, pp. 41-49; Mckinnon and Tallam, 2003).
3.4.1 Reception box

Reception box is permanently fixed to a wall outside the customer’s home. Delivery person has access to that box through using key or code. (Allen et al. 2007) Reception box is useful for delivery non perishable small parcel and post. However, reception box can be vulnerable to theft or other damages such as rain or storm. Hence, reception box may not be useful to deliver highly valuable and important parcel or goods. In addition, if customer requires to return goods/parcel he/she has to drop the parcel to nearby collection points.

Pros and Cons

Reception box present advantages of fewer failed deliveries, lower vehicle operating cost, and more control over planning, routeing, and scheduling of delivery rounds (Allen et al., 2007). With the use of reception box, third party logistics providers will not have to redeliver the products two or three before it successfully delivered due to consumer not been at home. This has the potential to reduce the cost associated with attended home deliveries, hence leading to efficiency and less carbon emission. For customers it is convenient to have their parcels delivered straight to a reception box in their home. Jones (2000), found that reception box reduce delivery time used and eliminate the redelivery cost when the customers are not attending to their given delivery time window. Although, reception box solutions enable the benefit of unattended reception, it main disadvantage is the cost associated with installing this boxes in customers home. Up-front investments and installation cost needed for reception box solution is high and it may lead huge losses if the customer does not use the services (Punakivi et al., 2001). The reception box is not widely used and the main reason for this is the high cost, which is estimated to be between 1,000 and 2,300 euros (Kamarainen and Punakivi, 2002). Investing in reception boxes will have a negative effect on the finances of third party logistics providers due to the huge cost associated with each instalment. However, if e-commerce business or customers are willing to finance their reception box, the burden of the financing boxes by 3PL will be eliminated.
3.4.2 Delivery boxes

Functionality of delivery box is almost similar to reception box. Usually delivery boxes are owned by the retailer or delivery company. Delivery person transport the delivery boxes, filled with goods and place at customer’s home. Customers are given key or password to open the box. Later on empty box/ boxes containing returned good are collected by delivery person in separate collection round.(Allen et al. 2007; Mckinnon and Tallam, 2003).

Pros and cons

The benefit of using delivery box include, fewer failed deliveries, lower vehicle operating cost, and more control over planning, routing, and scheduling of delivery rounds (Allen et al., 2007). 3PL will not have to redeliver parcels when using delivery box solution due to problem of customer not been at home. Delivery box solution shortens delivery time and eliminates redelivery cost (Jones, 2000). The main advantage of using delivery box is, it can used for more than one customer (flexibility) as compared to reception box, because of it mobility. The major burden on 3PL providers has to do with the cost involved in investing in these boxes. However, investment needed in delivery box solution is much lower than using customer specific reception boxes and if the customer does not start using the service, the boxes can be used to serve other customers because only a new locking device would have to installed for the customer (Punakivi et al., 2001). Comparing both solution, it will be prudent for 3PL providers to invest in delivery box solution due to it cost effectiveness as compared to reception box solution. That is the payback period for delivery box solution will be much shorter as compared to reception box solution. From 3PL service provider viewpoint, the delivery box solution makes faster acquisition of new customers and higher growth rate possible but from the customer viewpoint the reception box solution is preferable, offering total independence of the delivery time windows and logistics service provider (Punakivi et al., 2001).
3.4.3 Controlled home access

Controlled home access systems provide the delivery person with a means e.g. security code or keys to access to a locked area to drop goods normally the garage, shed or other outhouse (Allen et al. 2007; Rowlands, 2001). A key may be sealed inside a unit, which is mounted in a location where delivery staff can access it; the driver enters an access code into the sealed unit to release the key and open the nominated delivery location to leave the goods. (Allen et al. 2007). Home access system use a telephone linked electronic keypad to control the opening and closing of the door. The key pads communicate with a central server allowing the “home access” company to change the pin codes after each delivery. The key pay automatically generates another code number which is used to confirm that the delivery has been made when the driver closes the door. A confirmation message would be sent to the customers phone or email address when delivery is done. (Rowlands, 2001)

Pros and Cons

Controlled home access system offers the same benefit as both reception and delivery box solution in terms shortening delivery and eliminating redelivery cost hence leading to greater efficiency on the part of 3PL service providers. Rowlands (2001) found the home access system could cut average drop times from 10 minutes to 4 minutes and achieve a productivity level 84 % higher than the attended home delivery. The main security concern with his system is, it could serve as route into the home for burglars and goods delivered by one company could be stolen by a later delivery driver (Mckinnon and Tallam, 2003). For instance, delivering parcels and been stolen by someone means the 3PL service provider will have to reimburse the customer which will come at a cost to the 3PL.

3.4.5 Collection points

Collection points are based on the use of locations other than customers’ homes to which goods are delivered for pick up by customers. These goods can be delivered
to the nearest Post Office, convenience store, supermarkets or a petrol station with long opening hours which can be close the customers’ residence. In this case, customers can choose where they want to pick up their parcels, e.g. if they want to pick up their parcels closer to work instead of home. If no choice is made by the customer, the carrier will choose the nearest location. Goods are delivered by the retailer or their carrier to the collection point and the customer is informed that their order is ready for collection. With regards to collection point notification will be sent to the customer by either email, text, or letter that their parcel is in at the nearest pick up point or location. Collection points result in fewer delivery locations and improved drop density. (Allen et al. 2007). For example, Kiala company provides a collection point service for e-commerce company for non-food products in Europe including countries like Belgium, France, the Netherlands and Luxembourg. The company has established a network of collection point (Kiala point) of about 4660 in Europe which customers can collect, pay for and return their parcel of (Allen et al. 2007; Gevaers et al., 2009).

Pros and cons

The benefit of using collection point result in fewer delivery location and improved drop density (Allen et al., 2007). That is a bulk of products can be dropped at one location to serve customers around that locality. As compared to reception box, delivery box and home access collection point leads to greater efficiency because 3PL service providers will not move from house to house to deliver products but would deliver customers’ orders to a convenience store, hence cutting down transportation cost drastically. According to Ding (2014), size and weight of parcels at collection point are not strict or not limited as compared to locker banks. Mcleod et al., (2006) found that, customer mileage could be reduced by 80% using collection point for failed deliveries. Pick up can be done any time by the customer after delivery. This can result in huge reduction in transportation cost and eliminate redelivery cost for 3PL service providers. Wang et al., (2004) found that operation efficiency would improve drastically, because collection point could serve as
several delivery points. Collection point is beneficial to the operating parties, because about 25% collection point users would purchase something when collecting their parcels (Weltevreden, 2008). However, on the part of consumers, going to collection point to retrieve their parcels reduces the convenience of online shopping. That is with the use of collection point solution the main benefit of online shopping (convenience) could be defeated. However, (Mckinnon and Tallam, 2003; Weltevredden, 2008) found that the inconvenience related to collection point is reduced or solved if the collection is made in the course of a trip the consumer is already making. For instance, if a customer is going to the petrol station to buy fuel, the customer can collect their parcel thereby reducing or eliminating the problem of inconvenience.

3.4.6 Locker-banks

Locker-banks which are similar to collection points are groups of reception box units (lockers). They are not sited at each customer's premise but can be sited in apartment blocks, workplaces, car parks, railway stations, convenience store, shopping mall etc. In order to maximize its utilization customers are not usually allocated their own locker (lockers have electronic locks with a variable opening code, and can be used for different customers on different days). They may be used by one delivery company or used by many. When a customer order arrives he or she may notified by message about the box number and location, and the code to open the box. Locker-banks require the customer to make the final leg of the journey. However, locker-banks are normally located at precise areas to make the deviation in customers’ journeys as short as possible. Example of this type of solution is Pack station by InPost and DHL (Allen et al. 2007). For example, Deutsche Post (DHL) in Germany provide PackStation as a system of locker bank solution. The system offers customers the opportunity of access to their parcels 7 days a week, 24 hours per day and can also be used for parcel returns. Registered customers are issued with a PIN, an internet password and a city plan showing all the PackStation locations. Parcels are normally held for nine calendar days and can be used for
parcels up to a maximum size of 60*35*35 cm. First, in 2001 DHL introduce the PackStation in two cities in Germany namely Berlin and Dortmund. By the end of 2005, they had introduced 600 machines in more than 90 cities, used by over 300,000 of it registered customers. They had plans of national coverage by the end of 2007. (Allen et al. 2007).

![Figure 4: DHL Locker Banks at Willys Store at Teleborg, Vaxjo (Own Source)](image)

**Pros and Cons**

With the use of locker banks solution it is possible for 3PL service providers to drop off many orders at one stop, thereby reducing transportation cost and delivery time per customer. Locker banks have the potential of eliminating unsuccessful deliveries, and reducing delivery costs, city congestion, and greenhouse gas emissions (Iwan et al., 2015). Lemke et al., (2016) found that, locker banks favour the reduction of traffic and improve the use of cargo compartment by consolidating
deliveries and making them more independent from the available time slots. Locker banks offers flexibility because the lockers can be used for different customers. Lockers have electronic locks come with different opening code, and can be used for different customers on different days (Allen et al., 2007). Nonetheless, it implementation and efficient utilization of locker banks require the support of local residents, logistics providers and the support of local authorities with regard to permission and selection of sites (Iwan et al., 2015). Also, from the consumers’ point of view travelling to retrieve parcels defeats the main purpose of shopping online (convenience). But, the inconvenience related to locker banks is reduced or solved if the collection is made in the course of a trip the consumer is already making as in the case of collection points.

**Table 4: Comparison of attended home delivery and not at home last mile delivery solutions** (Source: Allen et al. 2007, pp.49)

<table>
<thead>
<tr>
<th></th>
<th>Attended home delivery</th>
<th>Reception box/ Delivery box</th>
<th>Home access system</th>
<th>Locker banks</th>
<th>Collection Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who covers the last mile?</td>
<td>Delivery company</td>
<td>Delivery Company (3PL)</td>
<td>Delivery Company (3PL)</td>
<td>Customer</td>
<td>Customer</td>
</tr>
<tr>
<td>Customer presence</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Types of product</td>
<td>Any</td>
<td>Packages/Parcel</td>
<td>Packages/Parcel</td>
<td>Packages/Parcel</td>
<td>Packages/Parcel</td>
</tr>
<tr>
<td>Failed deliveries</td>
<td>High</td>
<td>Virtually none</td>
<td>Virtually none</td>
<td>Virtually none</td>
<td>Virtually none</td>
</tr>
<tr>
<td>Delivery window</td>
<td>Fixed Delivery hours</td>
<td>Delivery company operating hours</td>
<td>Delivery company operating hours</td>
<td>Delivery company operating hours</td>
<td>CP opening hours</td>
</tr>
<tr>
<td>Times goods can be collected</td>
<td>Not appropriate</td>
<td>24 hours</td>
<td>24 hours</td>
<td>24 hours</td>
<td>CP opening hours</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td>Retrieval time for customer</td>
<td>None</td>
<td>Very short</td>
<td>Very short</td>
<td>Short-long</td>
<td>Short-long</td>
</tr>
<tr>
<td>Drop off time</td>
<td>Long</td>
<td>Short</td>
<td>Short</td>
<td>Very short</td>
<td>Very short</td>
</tr>
<tr>
<td>Initial investment</td>
<td>Low</td>
<td>High/Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Low-Medium</td>
</tr>
<tr>
<td>Delivery cost</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Lowest</td>
<td>Lowest</td>
</tr>
<tr>
<td>Possible operational problems</td>
<td>High failed deliveries</td>
<td>Large number of boxes needed/ Need to collect Boxes</td>
<td>Customers concern about safety and privacy</td>
<td>Customers has to travel to pick up (convenience)</td>
<td>Customers has to travel to pick up (convenience)</td>
</tr>
</tbody>
</table>
4. E-COMMERCE AND DELIVERY SOLUTIONS IN SWEDEN

Current e-commerce and delivery solutions in Sweden have been described in this chapter. E-commerce trends and last mile delivery solutions of major 3PL companies e.g. PostNord, Bring, DHL, in Sweden have been discussed.

4.1 E-commerce in the Nordics

In the Nordics region, residents are increasingly shopping online, and the boundary that exists between e-commerce and physical commerce is gradually disappearing. The growth potential in many product categories in the Nordic markets remains strong. The most popular products purchased online by Nordic residents are clothing and footwear, home electronics, and media, and this trend has continued for a number of years. On the other hand, the more mature online shoppers Nordic residents become, the greater the number of new types of goods they choose to buy online. For example in Nordic region we are currently seeing a trend in which online shoppers are beginning to buy larger and heavier goods, such as building supplies and major household appliances. (Håkan Ericsson - Group CEO, PostNord, 2017, pp. 3).

The demands and expectation of customers is common feature in the Nordic market that determines the conditions for e-retailers, logistics providers, and e-commerce business. The shopping experience must be simple, convenient, and flexible. Also the expectations of consumers concern the ability to keep track of their parcel, where it is, when it will be delivered is increasing all the time. Although Nordic consumers share many behavioral traits, e-retailers should be careful not to assume that the Nordic market is altogether homogeneous. The fact is each country in the Nordic market has several unique characteristics with regards to consumer traits (PostNord, 2017). Looking at the different Nordic markets reveals a number of clear differences that require both retailers and logistics operators to adapt to local
expectations. Eighty (80) % of Nordic online shoppers on average consider that being able to choose the method of delivery when shopping online is important.

Delivery of products continues to be an extremely essential part of the e-commerce experience, and convenient solutions attract new purchases in themselves. Online shoppers in the Nordics have different expectations and preferences when it comes to delivery products at all times (Håkan Ericsson - Group CEO, PostNord, 2017, pp. 3). For example, customers in Finland and Norway, prefer to have their goods delivered to their home mailboxes, whiles in Denmark and Sweden, customers prefer to have their parcels delivered to a collection point for pick up. Moreover, in Finland, systems that use 24/7 parcel machines for distribution have become increasingly common, and in Denmark the demand for and availability of home deliveries is significant (PostNord, 2017).

**Figure 5: Preferred delivery method in Nordic Region** (Source: PostNord 2017, pp.15)
In the subsequent section we provide an overview of e-commerce in Sweden which is part of the Nordic region.

4.2 E-Commerce in Sweden

With regards to e-commerce, Sweden occupies a leading position as an e-commerce nation relative to the rest of the Nordics region. The percentage of consumers who shop online in Sweden is the highest of the Nordic countries, and Swedes have proven to be willing to try new tools to streamline their purchases and simplify daily life. For example, more than four out of ten online shoppers made an average of at least one purchase by cell phone per month in 2017, which is a clear increase compared with the previous year. On average, two-thirds of Swedes shop online each month, and of these, three in ten make purchases from abroad. Averagely, each Swedish online shopper spends an average of EUR 200 online each month. The total estimate spent online in Sweden at the end of 2017 was EUR 8.7 (billion) of which 16% was purchased online from abroad. The percentage of the population that shop online every month and from abroad every month is 66% and 31% respectively (PostNord, 2018).

According to Carin Blom, (PostNord, 2017, pp.6) Swedes online shoppers are experienced and the frequency of their purchase via the internet is increasing. Both women and men shop online equally often in Sweden. The purchase they make primarily depend on the phase of life the consumer is in. In Sweden the young people often tend to buy clothing and beauty and health products, whereas older people primarily buy books, and those aged somewhere in between often buy more children’s items. In the past year Swedes have bought significantly more goods from China, a trend which is likely to continue as long as shipping charges remain low.

In 2017, e-commerce accounted for the majority of growth within durable goods trade in Sweden, i.e. everything except for food. Sweden is an e-commerce nation and consumers have high demands, both for the websites they shop from and for
deliveries. Consumers want clear information about when the product is coming and how it will be delivered, and they want to be able to guide these things on their own (Carin Blom, PostNord, 2017)

4.3 Delivery Solutions in Sweden

4.3.1 Collection Points

According to Bring, in the Nordic region collection point is the most delivery method used and they deliver to a network with more than 6000 collection points. In Sweden alone, they have 1400 locations where your customers can pick up their parcels, from collection points. In this case, customers can choose where they want to pick up their parcels, e.g. if they want to pick up their parcels closer to work instead of home. If no choice is made, they choose the nearest location. Parcel notifications are sent by text, email or letter and all parcels can be tracked on their website. Deliveries are made within 1-4 days in the Nordic region were Sweden is part off (Bring.se).

PostNord a leading logistics company in the Nordic countries conducted a survey on consumers. The consumer surveys were conducted using a representative selection of the national population aged 18–79 years in each country. It was conducted on 12 different occasions from February 2017 to January 2018 via an online panel TNS SIFO. In all, 19,186 respondents took part in Sweden, 21,293 in Denmark, 21,766 in Norway and 30,411 in Finland. As per the survey 84% of the customers in Sweden preferred their parcel to be delivered to collection or distribution point for pick up as compared to the other regions. Denmark, Norway, and Finland had 41%, 68%, and 71% respectively. In this case when it comes to Sweden, it is considered especially important that the parcels can be delivered to a collection point or distribution point, which stands out compared with the rest of the Nordic region (PostNord, 2018).

As part of it integration process in Europe in 2015, DHL Parcel took over the management of existing collection point network, compromising of about some 1350 shops in Sweden, which was previously run by DHL freight. According to
DHL the integration of the individual collection point network into the European parcel business will put DHL Parcel in position to offer nationwide delivery in Sweden in the future. Fabian Düx, Senior Vice President of Unattended Delivery at DHL Parcel Europe said,

“Thanks to this presence in Sweden, we have now integrated the primary market of Northern Europe into our parcel network and passed another milestone on the road to having a dedicated B2C infrastructure for Europe,”

DHL will have more than 10000 collection shops in Europe outside of Germany but in Sweden, private parcel shipments are not generally received at private residences, unlike most other European countries. Per DHL, more than 90% of all B2C items are delivered to collection shops for customers to go there to pick up their parcels. At the same time, they can also ship items from these shops, including any possible returns. Parcel shipping in Sweden with DHL cost 99 SEK as of January, 2016, regardless of the parcel weight or size (DHL.com).

4.3.2 Locker banks

In Sweden, Bring is offering parcel locker as solution. During the year 2015, logistic company Bring deployed eleven (11) parcel lockers in the Stockholm area. The company had a positive experience with them and expanded its test with parcel lockers in Gullmarsplan, the Royal Institute of Technology and the suburban train station in Spånga. For example, when Nordic logistics company Bring expands the number of automated parcel lockers in the Swedish capital, Stockholm, customers will be able to pick up their parcels at the subway. For this to be feasible, Bring decided to partner with Stockholm public transport company SL. Per Bring, their survey shows that many customers are satisfied with their parcel lockers. (Bring.se).

According to Forslund et al., (2016), locker banks are limited in Sweden, and even though they were tested on a pilot basis, but no parcel stations have been permanently established.
DHL collaborated with Danish firm Swipbox to install 60 automated parcel lockers at various locations throughout Sweden in 2015. Parcel lockers are common in Europe, especially in Germany where DHL has a network of more than 3000 parcel machines. With this collaboration with Swipbox, DHL is now expanding its parcel network in Sweden. According to Niklas Stenman, Business Development Manager at DHL Parcel in Sweden, DHL Parcel's goal for 2017 was to have at least 200 parcel lockers in Sweden. This means that customers who have registered to use the parcel locker service will receive a text message from DHL Express as soon as the item is ready for collection. This will contain a security code that customers simply need to enter at the designated station in order to receive their parcel. Also, DHL Express Sweden initiated collaboration with Instabox, a Stockholm-based start-up company that has parcel cabinets located in selected stores at the Pressbyrån and 7-Eleven chains to offer package cabinets in central locations in the Stockholm area. Collaboration means that DHL Express, which today has hundreds of DHL SwipBox ATMs around the country, continues to strengthen its position in the market by offering multiple delivery solutions to individuals who order goods from abroad. The parcel lockers are a simple, flexible and efficient way of delivering shipments from abroad (Transportnet.se).

At the end of the year 2015 Swedish grocery chain Willys installed package stations in 43 of its stores and also DHL reported that their investments in such automated parcel lockers turned out well. According to report parcel lockers are spreading in Sweden (Ehandel.se). Also, Bring is working together with Danish company Swipbox just like DHL, to place parcel lockers in grocery stores, in offices and at other places that consumers associate with parcel distribution. By operating together with SL, it should be easier for commuters or customers to pick up their packages on the go.

A study conducted by PostNord showed that out of the 19,186 respondent only, 13% will chose to have their parcel delivered to locker banks for pick up. This
means that the swedes prefer collection point to locker banks when it comes delivery of e-commerce product (PostNord, 2018).

4.3.3 Reception Box

In Sweden most houses and apartment has installed mailbox or reception box. Reception box or mailbox is generally suitable for smaller parcels that fit through the size of the letterbox, for example books, CDs and pharmaceutical products, etc. Normally, parcels would have to be delivered on a pre-arranged day and if the parcel is too large for the recipient’s letterbox, it will be sent to the nearest collection point (Bring.se). Per the survey conducted by PostNord in Sweden, 48% of the customers out of the 19,186 preferred that their parcel be delivered directly home to their mailbox or reception box (PostNord, 2018).

4.3.4 Home Access

Glue a company in Sweden offers consumers the opportunity to replace their front door key with an app that will allow users to share permanent, temporary or single-use access codes with family, friends, neighbors and even trusted 3PL companies for deliveries. Glue connects consumers’ homes with businesses. With the use of the technology access to customers home can be done via a proprietary digital smart lock and other digital locks using Glue’s API which lets users give out digital keys in the Glue app. They are integrated with leading logistics, retail and services companies to offer delivery into the home. Couriers can securely unlock a customer’s home to deliver an order while the customer is out with the use of Glue’s In-Home delivery app (Glue.com).

According to Glue we all know how frustrating it is to come home, only to realize you have to go back out to the post office to pick up parcel. Glue has a partnership with two of the leading Logistics Company in Sweden namely Bring and PostNord to make deliveries easier. Glue aims to enables the secure delivery of products and services into your home while you are away and to improve e-commerce, foster
trust and collaboration in communities and optimise time and resources. The current price for Glue smart kit is 2490 SEK (Glue.com).

Also, ASSA ABLOY, a Swedish lock manufacturer has partnered with PostNord to offer customers a new service where parcels can be delivered inside their door. Parcels can be delivered inside customers home and safely thanks to the new secure method devised by ASSA ABLOY and PostNord with the use of digital door lock. Customers and more households in Sweden are enjoying the benefits of shopping online. But it’s no good if you then have to wait at home for a parcel to be delivered. With digital locks from Yale Doorman, it is possible to have parcels delivered inside the front door.

A pilot project of in-home was initiated by PostNord and ASSA ABLOY along with e-retailers Jollyroom, Apotea and Komplett, with 100 households in Lerum, a town east of Gothenburg in Sweden. This project was launched in response to results from PostNord’s 2016 E-barometer Annual Report, which showed that one in four Swedish customers would like to have their parcels delivered in this way. It offers customers who have digital lock such as the Yale Doorman the opportunity to register for the service. PostNord delivery personnel automatically receives a single-use code for the Yale Doorman digital door lock to open the door and place the parcel inside (Assaabloy.com).

Customers need to choose home delivery when purchasing items online from any of the e-retailers participating in the trial. They then approve the delivery via their smartphone and PostNord’s driver automatically receives a single-use code for the Yale Doorman digital door lock to open the front door. When the driver placed the parcel inside the door, the code becomes invalid. Customers are then notified via their smartphone that the parcel has been delivered.

Imagine coming back from work or any place to meet your parcel from an online store in the hallway, all done while you were out, and at the same time you are helping reduce traffic congestion, pollution and redelivery cost. But the main
concern will be privacy and security issues. Would consumers be willing to open up their home for deliveries to place parcel in their hallway when they are away?
5. EMPIRICAL FINDINGS

The finding chapters authors analysis the collected data and explains the findings. The findings have been categorized and organized into three section based on the methods of data collection- Group Discussion, Interviews and Observation.

5.1 Focus Group Discussion

In all we had seven (7) students who took part in the focus group discussion, five males and two females. The discussion took 59 minutes to complete.

5.1.1 Shopping online

The entire seven participants had one way or the other shopped online. Four of them normally shop online and one only prefer to shop online if there is no possibility to get the product in a local store. What they buy online usually range from clothing or shoes, books, electronics, and home accessories. For electronic products, two participants said they do not like to purchase electronic products because they have trust issues with e-retailers or companies selling electronic product online. This because in electronic products you do not get the chance to test the product and there can be a high chance it can be damaged or it not working properly. They all prefer online shopping sometimes because of it convenient, time-saving, have access to different products and cheaper. With regards being cheaper two of the participants said they usually receive discounts notification from “Wish” and “Zalando” through emails before they decide to make any purchase.

5.1.2 Shipping time and delivery information

When it comes to shipping of the product six of the participant said they will opt for free delivery, but one said he prefers to pay sometimes to get his products early depending on how urgent he needs it. He said for payment of shipping, the charge is nominal for him, because it convenient and time saving compared to the time and money he will waste moving from one to the other shop searching for a product. With regards to delivery time, the participants were of the common view that it
depends where you are buying the product from in terms of the online shop and which country. For example, one participant said when you buy from “Amazon” it takes like two weeks, from “Zalando” it will take like a week but for “Wish” which is in China can take like up to a month and a half.

They all preferred to have clear information about how the product will be delivered (reception box, collection point, home delivery, and locker banks) and getting a clear timeline or indication of when the product will be delivered. But when it comes to selecting a 3PL company for their deliveries the entire participant said, they will first take costs into consideration when selecting the service provider. For example, one participant said she does not prefer to use DHL for her delivery because their shipping cost is expensive. With regards to selecting a preferred 3PL when they shop online for delivery services, they all said they do not get the option to select a 3PL company. Two of the participants were of the view that e-retailers have already signed contract with 3PL companies who deliver parcels on their behalf. So they normally have no option to select the best service provider whether in terms of cost and delivery efficiency for their deliveries.

5.1.3 Delivery method preferred

With regards to the delivery product, six of the participant said they will prefer that the product is delivered to their home. The reason is that, the main purpose for shopping online is to have the product at your doorstep, thus the convenience and time saving aspect of online shopping compared to the physical or traditional method of shopping. This is because it will not be prudent for them to walk to a collection point to pick up a heavy/large size parcel.

For one of the participant, she was more concern about security issue so when buying online she opts for the nearest collection point for the product to be delivered for pick up because she does not want her home address known. However, she went ahead and said when it comes to the convenience aspect of online shopping she will
sometimes opt for home deliveries when the parcel is heavy or large in size for her to carry.

5.1.4 Controlled Home access

Regarding home access delivery, six of the participant rejected the idea of the delivery person opening their door and placing the parcel. They were more concern about the security and privacy issues of an unknown delivery person access their home. One said he will never mind for delivery person to open their door and place a parcel. He is not really concern about the security because he will know who to hold responsible in case of any theft. This is because by entering the access code into the keypad the delivery person confirms his/her presence at the home. However, two of the participant who rejected the idea of home access said, maybe they will consider opting for it if the lock come with CCTV camera to monitor delivery person either on their phone or a recording their activity in their home. With regards to security and privacy issue, one said the solution will be to have a storage room in apartment buildings where they can install a CCTV camera for delivery person to drop off parcels for customer to pick up later. He said to implement the home access concept the new building construction should incorporate a space or small room for delivery of parcels where tenants will use as an option for home access.

5.1.5 Preferred delivery solution if not at home

On the preferred delivery method in case they are not at home, they were of the common view that it will depend on the size and weight of the product you are ordering. For parcels which will fit the size of the mailbox or reception box they will opt for this solution for delivery. But one participant said in his case, he has bought products online which normally fit the size of the reception box but he will either receive a letter in his reception box or notification to go pick his parcel at the nearest collection point. He was of the view that if the parcel will fit in his reception box it should be left in it but not delivered to a collection point. His claim was
supported by three of the participants, who have had similar experience. But one participant had a different experience, when she bought a phone online which was delivered to her students’ reception box or mailbox. When ordering items which are large in size, they were of the common view that collection point will be the best alternative. They said collection point have the ability to handle different sizes of parcels whether small or large sizes or heavy items. But one participants said, collection point can take more time for collection in terms walking distance and eventual waiting in queue to pick up your parcel, which sometimes it's inconvenient and time wasting. The one who initially opted for home access delivery said for now he will prefer to use collection point. But in the near future when he has his own apartment, he will always be willing to use home access delivery as a solution if he is not at home at time of delivery.

5.2 Individual Interviews
The following paragraphs analyse individual interviews and explain the findings.

5.2.1 Shopping online
With the increasing number of online shops and banking facilities and convenience, shopping online has been increasing at a faster rate. Besides access to many shops across the world and faster delivery with a reasonable cost significantly contribute to increasing online shopping. All of the interviewees, to some point, shop online. However the products they buy online varies. Most of these interviewees buy electronic devices and clothes. According to interviewees (4,5,6 and 9) price is one of the big factors for shopping online. Many online shops and marketplace such Wish, Zalando, eBay, Amazon, etc. often offer high discount. All of the interviewees to some extent agree that shipping cost is reasonable. Most of the agree that often they get free shipment particularly from Wish, eBay, and Zalando.. Interviewees (1,5 and 9) said that sometimes it is difficult to get some products they want. Therefore they have to search those items online. Besides that online shops and marketplaces offer more options than local shops.
5.2.2 Delivery methods

The delivery method is the one the most critical process for all three stakeholders - e-commerce companies/sellers, 3PL providers and customers. Delivery processes require the direct engagement of sellers, logistics service providers and customers. Therefore delivery method is a critical factor for shipment cost, delivery time, convenience, and customer satisfaction. The interviewees discussed about delivery methods discussed in literature reviews and the delivery method they follow in collecting goods.

5.2.2.1 Collection points

Although, all the interviewees prefer home delivery but all of them in most of the time receive goods from collection points due to busy work schedules. However, receiving goods from collection points is also difficult for service holders. Managing and finding time during work hours to pick up is big problem for some interviewees. Therefore in weekdays it is difficult to find time to collect goods. The problem is acute to interviewees (1, 4, and 6). According to interviewee 1, sometimes she has to waste/hamper office hours to collect goods. Although there are several methods available, but in most of the cases, customers are given two options either home deliver or collections points. Sometimes, e-commerce companies do not provide information about specific final delivery methods. Therefore, customers has no choice than to accept goods from collections points. The interviewee 9 is very disappointed about this behaviour of e-commerce/3PL providers. She expects that e-commerce should give her choice/option to select delivery method. However, for interviewee three he get the option to choose whether he will opt home delivery or collection point. For interviewee 7, in some cases collection points can take more time for collection in terms distance covered and eventually waiting in queue to pick up your parcel.
5.2.2.2 Locker Banks

Lockers banks have almost similar characteristics as collection points but comes little bit more convenience and freedom. In the observation, the authors noticed that collections point are more available, whereas only few superstores have locker banks. During the observation it has been noticed that few people use locker banks. Almost all of the interviewees also stated that they never use locker banks. Even many of them have no idea about locker banks and they never see locker banks. Only the interviewee 9 has had experience using locker banks in Germany. After discussing about locker banks, all of the interviewees showed interest about locker banks. Afterwards some interviewees said they have seen locker banks before but they have no idea about how it works and have not used it before. The interviewees pointed out the advantages and disadvantages of locker banks. For example, interviewee(1,5,6,7,and 9) one advantage of locker banks is it could be accessed
24/7. However, in the observation the authors have identified that the locker banks Vaxjo- particularly at Willys Teleborg is only available from 8.00am to 10.00pm and the locker banks is located inside the store. As a result, customers do not have access to locker banks after the store is closed. However, most of the interviewees said locker banks have some convenience for working people. They can gain access to locker banks after their office hours. Therefore, they need to worry and waste office hours. However, interviewee 1 said, problem may arise when the size of the parcel is big or weight, which might not fit in the locker banks. This was problem was also shared by interviewee (3,7, and 8).

Figure 7: Locker Banks at Willys at Teleborg, Vaxjo (Own Source)
5.2.2.3 Controlled Home Access

Based on the interviews, we found that none of the interviewees had no idea or experience controlled home access delivery. After discussing about the methods and showing a video from YouTube, the initial feedback from interviewees were mixed. Some of them were quite positive about the method and but most of them were scared about security and privacy issues. Most of the interviewees said that due to security and privacy issues, in future they will not allow home access. Some interviewee stated that there is possibility of theft and other crimes. Interviewee 1 said that there might real security privacy and issues, as she lives alone. The interviewee 9 said, as home access facility will use internet and other communication technologies, there is high possibility of hacking. Somebody can hack the password and enter my apartment. Besides, interviewee (5 and 6) said that it will be expensive to install home access technology as currently very few houses have this technology. For interviewee 5, developing such technology will require significant investment. He further stated that there are also some psychological issues in controlled home access. For example, he said if amazon or other e-commerce companies develop and set up home access technologies at my home, I will be emotionally forced to buy goods from these companies.

Interviewee 6 questioned who will pay the cost of setting home access facilities because I will not pay for that. In addition there are some privacy and security issues such as delivery person can steal something from home as shared by most of the interviewees or other person can enter into my home. Due to these reason interviewee 5 said he will not consider this method of delivery. Only interviewee 3 showed interest in this method. He stated that if the systems is okay and secured, he will allow home access because he is very busy and at the same very lazy to collect goods from collections point. He said it will be really helpful for him if delivery company drop goods/parcel to my home. However, interviewee 1, who rejected the idea earlier, stated that if the method is tested, matured and secured, in future she might allow home access.
5.2.3 Preferred delivery solution if not at home

Although all of the interviewee prefer home delivery, as they work during office hour it is difficult to receive goods from delivery person. We found that due to work and busy schedule of the interviewees sometimes they will not be home at the time of delivery. They were divergent views regarding which method of delivery they will opt for in case they are not at home. Interviewees (1,4,6,7, and 8) will prefer their parcel to be sent to a nearby collection point like ICA store or Willys for pick up later. To them collection point offers them opportunity to order items without restriction on parcel size and weight. For interviewee (4,6 and 8), collection point seems convenient for them and sometimes they use collection of parcel in superstore to shop for groceries. However, interviewee 7 said, in some cases collection points can take more time for collection in terms distance covered and eventual waiting in queue to pick up your parcel which is not convenient for him. Interviewee (2,5 and 9) will rather opt for locker banks as alternative solution if they are not at home at the time of delivery. For interviewee 2 locker banks will be more convenient, particularly in relation to 24 hours access to pick up parcel anytime you want. The interviewee 5 said it could be good for them if the locker bank are established near to their home or common place near to residential area. With regards to home access solution only interviewee 3 will prefer to use this solution. He doesn't want to go to collection points or locker banks. He will allow controlled home access. He argued that the main purpose of shopping online is convenience and he does not like to go to collection points or other place to collect goods.
Table 5: Preferred delivery method when not at home

<table>
<thead>
<tr>
<th>Participants (Interviews)</th>
<th>Preferred delivery solution if not at home</th>
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</thead>
<tbody>
<tr>
<td>Interviewees 1,4,6,7, and 8</td>
<td>Collection point</td>
</tr>
<tr>
<td>Interviewees 2,5 and 9</td>
<td>Locker banks</td>
</tr>
<tr>
<td>Interviewee 3</td>
<td>Home access</td>
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</tbody>
</table>

5.2.4 Delivery experience

The interviewees have both positive and negative experiences of collecting goods. Some of the interviewee stated that several times they received goods couple of days before expected time of delivery. Interviewee one stated that 3PL companies offer very fast delivery with reasonable higher price. Many of the delivery service providers e.g. DHL provide precise delivery information which includes tracking of goods when in transit. Some of the interviewees particularly interviewee (1,5 and 9) have bitter experience. Particularly for interviewees (1,3, and 5) collecting goods at office time is very ironic. They face serious problem finding time to collect goods from collection point. Therefore often they have to wait additional 2-3 days collect goods. The interviewee 9 also had a bad experience of home delivery. She said that although she was in her home whole day, delivery person didn’t inform her time of arrival or even didn’t knock her door when the delivery person arrived at her place. She had to wait couple of weeks and finally contact with office of PostNord to collect goods. All of the interviewees complain that e-commerce companies do not give them opportunities to select delivery method except selecting home delivery or collection points. They are never given options to select other methods such as Locker Banks or Reception Box. Overall, the interviewee are not happy with receiving goods.
5.2.5 Shipping time and delivery information

Over the years advanced logistic and transport facilities have tremendously reduced delivery time. Interviewee 1, stated that few years ago she was able to do delivery from Turkey to Sweden in 24 hours, off-course with a premium price. According to the interviewees, it usually takes two days to couple of weeks to get the products. Interviewee 5 pointed out that when he buy online and want free shipment it takes couple of weeks. However, delivery times also varies because of e-commerce companies and third party logistics service provides. For instance, according to interviewees (1,3,5 and 9), DHL deliver more faster as compared to other 3PL. It takes longer time when customer buy from outside of Europe.

According to the interviewees, they generally get all required information such as expected delivery time and return policy, collection points, etc. when ordering goods. Most of the interviewees stated that if they do not ask of home delivery, they are given options to select collection points.

5.3 External Observation

As part of the master thesis, we conducted observation at Willys and ICA KVANTUM which are both in Teleborg. The observation was carried out to know the process customers go through to pick up parcel from collection point and locker banks. Both of the observed stores operate in Växjö.

5.3.1 The Pick-up Process

When customers visit the store, he/she should take a ticket for service from an electronic machine. The customers are called and served based on the ticket number. At ICA KVANTUM, the observation was carried out for 28 minute and in all 15 customers came to pick up their parcel. The customer will be made to show their notification either by text, email or letter plus an Identification (ID) card. to pick up his/her parcel. It takes approximately four (4) minute for a customer from taking an e-ticket and picking up his parcel. The time will depend on the number of people in
the queue to pick up their parcel. Out of the fifteen customers four proceeded to shop at ICA KVANTUM.

At Willys Teleborg the observation was carried out for 30 minute and 15 customers came to pick up their parcel from the collection point, but two continued to shop at Willys. There is a DHL Swipbox at Willys but none of the customers used the locker banks to retrieve their parcel. Although from our observation most of the parcel retrieve will fixed well in the locker banks. From our observation, we think that customers will prefer to take an e-ticket join the queue to be called to pick up their parcel, rather than opt for the locker banks.

Summary of the chapter

Figure 8: Current Last Mile Delivery Solutions (Own work)

Based on the empirical findings, the current last mile delivery solutions diagram has been created. The study found that customers mainly use collection points for last mile delivery. In Sweden major 3PL companies e.g. PostNord, DHL, Bring, etc
have large number of collections points. The other advanced technology delivery methods such as controlled home access and automated locker banks are still in early stage. Major 3PL providers e.g. PostNords, Bring, DHL, are expanding the number of locker banks. PostNord, partnering with other companies is working on controlled home access method. The study found that due to privacy and security, the participants have least interest to use controlled home access method in future.
6. DISCUSSION

Chapter six answers the research questions based on literature review and empirical findings. The chapter starts with answering question one, follows up analyzing advantages and challenges of preferred delivery methods by customers. The chapter ends with discussing potential last mile delivery solutions based findings of the study both from customers and 3pl services provider's perspective.

6.1 Research Question 1

Successful delivery of goods is the most critical aspect for e-commerce and third party delivery companies. Inefficient and ineffective delivery process may lead to unsuccessful delivery. Inefficient and unsuccessful last mile delivery of goods may discourage customers to buy online, which may results in reduction of online sales. In addition, inefficient and flawed delivery methods seriously affect the performance and the profitability of 3PL service providers and might lead to end the contractual agreement with e-commerce company. Out of many other issues ‘Not at home problem, is major cause of unsuccessful delivery and return of goods. The first research question will address this problems.

RQ 1- What solutions are used to address the “not at home problem” of last mile delivery?

Sweden as the leading e-commerce nation relative to the rest of the Nordics region, occupies the highest of the Nordic countries in online shopping Sweden (PostNord, 2018). The study found people shop online mainly for three reasons - cheaper prices, access to products that are available at local store, and convenience from buying goods from any place anytime. According to the survey by Postnord(2018), apart from Home delivery three delivery methods- Collection Points, Reception Box, and Locker Banks are offered by major 3PL services providers such PostNord, DHL, in Sweden. However, recently PostNord, partnering with Glue and Assaabloy, has launched a pilot project on controlled home access in Gothenburg. In the study, it was found that out of these fours methods, customers
mainly use collection points and home delivery when shop online. In the following paragraphs, the methods to address the “not at home problem” of last mile delivery are discussed.

6.1.1 Collection points

Collection points is the most common method used for delivering goods. According to the survey conducted by PostNord, in Sweden majority customers use collection points as last mile delivery method. In the study, authors sound that all of the participant frequently use collection points. Particularly for professionals, being present at home and receiving parcel from delivery person in weekday is very difficult. However, only one participant, the interviewee two, who used to work as freelance IT professional from his home is able to receive goods from home. Major 3PL companies including PostNord, DHL, etc, cooperating with some retailers such as Willys, ICA, restaurant, e.g Subway, have extensive network collection points in Sweden. Swedish 3PL company Bring alone has 1400 collection points, whereas DHL has 1350 collection points in cooperating with major retailers in Sweden.

Advantages of collection points

There are several advantages of collection points. Firstly, delivery of goods through collections points is quite economical for 3PL companies. Collect Points enables 3PL provider to transport many parcels together and thus these company can efficiently use their resources. Besides this method significantly reduce the risk delivery failure. Usually collections points are located at superstores, which are often near to residential areas. Therefore customers/receivers need not to travel long distance to collect parcel. In addition, 3PL companies can deliver all kinds of goods in different sizes. In our observation, it was noticed collection points are open until 22.00 pm at Willys and 20.00 at ICA. During weekend these collections are also open. Although interviewees one and three stated that they find it difficult to collect goods during office hours. As the collections points are available after office hours it possible to collect goods.
Disadvantages of Collection Points

Even though collection points are often located nearby to residential areas and in most of the case located within 3 miles of residential area, still customers need to manage time and go to collection points. This often creates additional stress to consumers/customers and might discourage to shop online. Interviewee (1 and 5), stated their disappointment at picking up goods from collection points. Participants in the focus group discussion also raised question that what if the parcel is large and heavy and collection points is couple of miles away from their apartment. If customers, don’t have any car how he/she carries the parcel? In our observation, we noticed that a young mother with her little baby was carrying parcel from Willys at Teleborg, Vaxjo. She was very uncomfortable to carry both the baby and the parcel together.

6.1.2 Reception Box

In our observation, we noticed that most of the residential apartment have reception box for each apartment. The rest half of the apartments have tiny pocket, which can used to deliver letters or newspapers. Reception box is mainly suitable for letters. The interviewees and participants in the focus groups stated that they usually get their letters in their reception box and inside the door through using tiny pocket in the front door of their apartment. The main disadvantage of reception box is the limited capacity of the box. These boxes are often not suitable for goods in relatively bigger parcel. As a result, when shop online, customers have to choose other delivery methods.

6.1.3 Locker Banks

Compared to other delivery methods, Locker Banks is newly introduced in Sweden. In 2015, Swedish 3PL service provider Bring, partnering with Stockholm public transport company SL, deployed eleven automated parcel lockers in Stockholm. The
locker banks were primarily established at the subway in Stockholm. On the other hand DHL collaborated with Danish firm Swipbox installed 60 automated parcel lockers at various locations throughout Sweden in 2015 and had goal to deploy least 200 parcel lockers in Sweden. Ted Söderholm, CEO for DHL Express Sweden, said:

“In Sweden, we deliver thousands of parcels from abroad to individuals each month and the number is rising sharply. The challenge for us at DHL Express is to deliver to individuals in the daytime when many of them are at work. Launching machines in stores is a sought-after solution and makes it easier for those who order from abroad. We are planning a major expansion with hundreds of units in the near future.” (DHLfreight.se)

The study found that except the interviewee 9, none of the participants has any previous experience of using locker banks. However, some of the participant saw locker banks but didn’t have any idea how to use that. These participants were never offered locker banks services while shopping online. The reason behind not offering locker banks is currently there are limited number of locker banks. In the observation, the authors found only one Locker Banks of DHL located at inside the superstore, Willys at Teleborg, Vaxjo. During the observation, it was noticed that there was no customers/receiver using locker banks.

**Advantages of Locker Banks**

There are several advantages of using locker banks. The first advantage is 24 hours accessibility. According to Tobias Åbone from Bring “It’s particularly simple, fast and easy to retrieve your packages from a vending machine, without having to stand in line”. The interviewees and the participants in the focus group pointed out that it would be big advantage. However in the observation, the authors found that Locker Banks at the Willys store is located inside the store and accessible from 8am to 10pm everyday. However locker banks at subways in Stockholm are accessible 24 hours. The interviewees and the participants in focus group agreed that they will feel
less stressed using locker banks. Besides customers need not wait for long queue to collect parcel.

**Disadvantages of Locker Banks**

The main disadvantages of locker banks, like collection points, customers need to go to specific places for instances to nearby superstore to collect parcel. Interviewee 2 stated that she does not find any difference between usability of collection points and locker banks, as she needs to go to collection points. During the observation, it was noticed that there different sizes of box in the locker banks. However, even the largest box in the locker banks can not contain big parcel. Therefore locker bank is not suitable for delivering large parcel. For instance, the interviewee 3 frequently buy parts for his car. The interviewee stated that because of different size and shape of the parts, locker bank will not be suitable.

**6.1.4 Controlled Home Access method**

Controlled Home Access method enables to delivery person to access specific area, specifically front door of an apartment to drop parcel. Swedish company Glue offers smart lock solution to household and 3PL companies that enable couriers to securely unlock a customer’s home to deliver an order while the customer is out. Glue CEO Carl Johan Grandinson said,

“Not only does this partnership take delivery services to the next level, it ‘unlocks’ the force of the on-demand economy and encourages people to think differently when it comes to opening up their homes for services that make everyday life easier,”

The current price for Glue smart kit is 2490 SEK and the installation cost will be much higher. As mentioned earlier in chapter four, ASSA ABLOY, a Swedish lock manufacturer with partnering PostNord offer home delivery service to customers using smart lock solutions. Kristoffer Wadman, director business development at ASSA ABLOY Scandinavia, said,
“We’re seeing great demand from both companies and households for greater choice and solutions that make daily life easier. With new and innovative products, such as our Yale Doorman lock, our customers will have the opportunity to simply and securely avail themselves of different services without having to be at home themselves or available at particular times.” (Assaabloy.com)

Johan Hellman, head of e-commerce at PostNord, said,

“It should be simple and convenient to shop online. We’re seeing a clear trend and a demand for greater choice when it comes to delivery, and we’ll now be able to deliver items inside the front door in a secure way. The recipient doesn’t need to be at home or be available at a particular time, which makes it both simple and convenient. Our ambition is for PostNord to deliver items in the way that best suits the recipient.” (Assaabloy.com).

The interviewees and the participants also agreed that controlled home access could provide desired convenience for shopping online. However, none of the participants has never had the experience of using smart lock and controlled home access. In fact, due to privacy and security issues, except interviewee 3, none of the participant agreed to use that method. Interviewee 1 showed some interest allowing home access, only if the method is proven secured and matured.

Challenges of Controlled Home Access method

Security is the biggest challenge of ‘Home Access Solution’. All of the participants pointed out that security and privacy are the main problems of controlled home access. For this reasons, the participants are not interested to give access to their home when they are not present. The participants argued that if something is stolen or some crimes happened who will be responsible. The interviewee nine mentioned that there is possibility of hacking the smart lock and unauthorized access. Besides, installing such smart lock solution requires investment. The interviewees five and six argued that who will pay the money and they are interested to pay for installation smart lock. Even though, there will be surveillance and monitoring
systems such as CCTV camera and notification on the smartphone of customers, when delivery enter customer’s apartment, the participant are not convinced to allow home access delivery. Another challenge of home access delivery is returning goods (Allen et al., 2007, pp. 41-49; Mckinnon and Talla, 2003). If customers need to return goods, they have to go to nearby collection points or service centre of 3PL companies to drop the parcel.

6.2 Research Question 2

The second research question of this thesis is to answer which of this solution discussed in RQ1 are preferred by customers. Based on the empirical findings this section will discuss the different solution from the customers’ perspective.

RQ2 - Which of these solutions are preferred by customers?

In terms of customers’ preference when buying online, it is clear that people in different countries expect different delivery methods from e-commerce or e-retailers and 3PL providers. By conducting interviews and focus group discussion, customers shopping online still prefer home deliveries. This is due to that fact that the main purpose of shopping online is to have the product delivered to your home, thus the convenience aspect of online shopping. The findings from our focus group discussion and interviews showed that customers prefer home delivery, although there are alternative delivery solutions available. In the focus group discussion six out of the seven participants prefer their parcel to be delivered directly to their home. Also based on the findings from the interviews, the entire participant prefers home delivery when they buy products online. This finding corresponds to studies conducted by Morganti et al., (2014) in relation to customers in Germany and Barclays (2014) in relation customers in UK, France, and Germany. According to Morganti et al., (2014), although Germany has quite a dense pick-up point network where customers are approximately 10 minute within locker banks, 90% of the customers still prefer home delivery whiles 4% of them prefer to have their parcels delivered to locker banks. The same claim is supported by research conducted by
Barclays (2014), which states that 94.9%, 79.6% and 87.2% of customers surveyed in UK, France, and Germany respectively prefer home delivery. However, our findings go contrary to survey conducted by PostNord (2017 and 2018) which showed customers in Sweden will have their parcels delivered to collection point.

However, due to the work and busy schedules of customers deliveries are normally done when customers are not at home to receive them. For this customers will have to opt for an alternative solution to make delivery of parcel successful. The empirical findings, based on the focus group discussion and interviews, showed that selecting a delivery method like reception box or locker banks when not at home will depend on the size of the product you are purchasing online. For example DHL locker banks can be used for parcels up to a maximum size of 60*35*35 cm (Allen et al. 2007). From the focus group discussion, interviews and observation, reception box and locker banks will have some limitation in regarding products which are large in size. Based on the focus group discussion, the participants were of the common view that parcels should be left in reception box if it small and will fit in. One participant said in his case, he has bought products online which normally fit the size of the reception box but he will either receive a letter in his reception box or notification to go pick his parcel at the nearest collection point. This claim was supported by two of the participants. But one participant had a different experience, because she bought a phone online and it was delivered to her students’ reception box or mailbox. For this different experience with regards to using reception box, it’s clear that the online shops customers buy from plays a major role of how your product would be delivered. A consumer survey conducted by PostNord in 2017 and 2018 showed that 31% and 48% respectively, will choose to have their product delivered directly to their mailbox. However, they were of the view when ordering items which are large in size, collection point will be the best solution.

As said earlier all the interviewees prefer home delivery, as they work during office hour it is difficult to receive goods from delivery person. We found that due to work and busy schedule of the interviewees, sometimes they will not be home at the time
of delivery. They were divergent views regarding which method of delivery they will opt for in case they are not at home. Based on the interviews we found that five out the nine interviewees (1, 4, 6, 7, and 8) will prefer their parcel to be delivered to a collection point for pick up. The main reason for selecting this solution and not reception box or locker banks is, they have no reception box or mailbox in their apartment. Apart from that reception box or mailbox and locker banks comes with size and weight limitation. To them collection point offers them opportunity to order items without limitation on parcel size and weight. This is supported by Ding (2014) who found that, size and weight of parcels at collection point are not strict or not limited as compared to locker banks. According to interviewee (4, 6 and 8), collection point seems convenient for them and sometimes they use collection of parcel in superstore to shop for groceries. Also from our observation, we saw that 6 people who came to pick up their parcel went ahead to shop in the process. Weltevreden (2008) found that collection point is beneficial to the operating parties because collection point users would purchase something when collecting their parcels. However, interviewee 7 said, in some cases collection points can take more time for collection in terms distance covered and eventual waiting in queue to pick up your parcel which is not convenient. McKinnon and Tallam (2003) and Weltevreden (2008) found that the inconvenience related to collection point is reduced or solved if the collection is made in the course of a trip the consumer is already making. For instance, if a customer is going to the petrol station to buy fuel or superstore to buy groceries, the customer can collect their parcel thereby reducing or eliminating the problem of inconvenience. From the focus group discussion, they were of the common view they will prefer to pick up their parcel from collection point. However, this is influenced by whether they have reception box in their apartment or house and are buying items which are large in size can fit well in mailbox. Also from our observation carried out at ICA KVANTUM in 28 minute, 15 customers came to pick up their parcel of different sizes (that is at approximately every two minute a customer comes to pick up a parcel). At Willys Teleborg the observation was carried out for 30 minute and 15 customers came to pick up their
parcel from the collection point (at every two minute a customer comes to pick up parcel). Moreover, there is a DHL Swipbox sited at Willys but none of the customers used the locker banks to retrieve their parcel during our observation. From our observation, it could be the case that customers are aware of locker banks but do need see the need to use them since they collect parcel in the same setting (collection point) where this locker banks are found. As per a survey conducted by PostNord, 84% of the customers in Sweden preferred their parcel to be delivered to collection or distribution point for pick up. It was conducted on 12 different occasions from February 2017 to January 2018 via an online panel TNS SIFO (PostNord, 2018). PostNord (2017) found that Swedish customers prefer to have their parcels delivered to a collection point for pick up. The finding corresponds to studies conducted by Morganti et al., (2014) which showed customers in France prefer to use collection point. As per Morganti et al., (2014), pickup points is a well-established alternative to home delivery in France at the national level, due to their presence coverage in urban, suburban, and rural areas.

Also based on the interviews, we found out three participants (2,5, and 9) will prefer that parcel will be delivered to locker banks. They were of the view that locker banks will be more convenient, particularly in relation to 24 hours access to pick up parcel anytime you want. The fact three of the participants will prefer to use locker banks shows that locker banks has the potential to grow. A study conducted by PostNord showed that out of the 19, 186 respondents, only 13% will chose to have their parcel delivered to locker banks for pick up (PostNord, 2018). Looking at the survey conducted by PostNord the previous year showed that out of the 19,122 respondents, only 2% will prefer to collect their parcel from locker banks that is accessible 24/7(PostNord, 2017). We found that most participants have seen locker banks before but they have no idea about how it works and have not used it before. Some even had no idea about locker banks. It could be the case that Swedish are more used to collection point (PostNord, 2017 and 2018) compared to Germany who are used to locker banks (Morganti et al., 2014). However, the reason could be
that locker banks were recently introduced in Sweden. According to Forslund et al., (2016), the locker banks is a newly employed solution in Sweden and Swedish online shoppers may have lack knowledge in using locker banks. Nonetheless, this situation could be improved with a close collaboration of the various players, such collaboration between DHL and Swipbox, DHL and Instabox, Bring with Stockholm public transport company SL, Instabox with Pressbyrån and 7-Eleven chains.

With regards to home access solution only one participant (Interviewee 3) will prefer to use this solution. He argued that the main purpose of shopping online is convenience and having the product delivered to your home. However, based on the focus group discussion and interviews, we found most of the participants were against home access delivery due to security and privacy issues. For some of the participants they will never consider the idea having delivery person opening their door and dropping a parcel in their hallway due to trust issues. This corresponds with the argument made by Mckinnon and Tallam (2003), who found that the main issue with home access system has to do with security and privacy. They were of the view that, it could serve as route into the home for burglars particularly those in collusion with delivery drivers and goods delivered by one company could be stolen by a later delivery driver (Mckinnon and Tallam 2003). We found that two of the participant may consider opting for it if the lock come with CCTV camera to monitor delivery person either on their phone or a recording their activity in their home. But the main concern will people be willing to have CCTV camera in their due to concerns about digital privacy and cyber-attacks. The fact that one person opted for home access delivery and others will consider the idea if it secured, means home access delivery has the potential to grow in Sweden. For example, in 2017 a pilot project of in-home was initiated by PostNord and ASSA ABLOY along with e-retailers Jollyroom, Apotea and Komplett, with 100 households in Lerum, a town east of Gothenburg in Sweden. This project was launched in response to results from PostNord’s 2016 E-barometer Annual Report, which showed that one in four
Swedish customers would like to have their parcels delivered in this way (Assaabloy.com). Also, Glue has a partnership with two of the leading Logistics Company in Sweden namely Bring and PostNord to make deliveries easier in some selected cities in Sweden.

6.3 Recommended Last Mile Delivery Solutions
In order to solve the current problems, considering current delivery method and expectation of the participants, the authors recommend following solutions.

Recommendation one: Secured room at residential building to drop parcel.

Recommendation two: Automated Locker Banks closer or in side the residential building

Recommendation three: Collection Points more closer to residential area.

Figure 9 : Recommended Last Mile Delivery Solutions (Source: Own Work)

Based analysis of literature review and empirical findings, the recommended last mile delivery solutions has been proposed.
6.3.1 Secured room at residential building
Secured room at residential building will enable delivery person access that room using one time code to drop parcel. The secured room could be washroom or locker room at residential building. There will be some surveillance systems e.g. CCTV camera, sensors for security purpose. In Addition, customer will get message or notification when delivery person access that room and drop parcel. The main advantages of this solution customers will enjoy home delivery service, without being present at home in delivery time. Besides, customers need not to worry about going to collections points or locker bank, they can gain access to that room anytime. In addition the secured room will be shared by all other resident of that building. The challenges of privacy and securities will be minimized using advanced technologies.

However the main challenges will be finding a secured room in residential building. In addition, 3PL providers or homeowners have to monitor and keep maintenance of that room on regular basis. In this proposed solution, the delivery cost will be a bit higher than collection points. Delivering parcel in secured room will be less than reception box, since the room will be shared by all other residents of that building.

6.3.2 Automated Locker Banks closer to residential area
Automated locker banks closer to residential area will provide some additional advantages to customers. Firstly the automated locker banks will located very closer to customers home and will be accessible for 24 hours. As a result to need travel very short distance to get their parcel. Besides, customers worry about time, as the automated locker banks will be accessible 24 hours.

As the proposed locker banks will be located outside of building, the main challenge will be security of the locker banks. There will be possibility stealing and hacking. However the security challenges can be minimized by using advanced security measures and surveillance systems used in Automated Teller Machine (ATM).
Initially installing and later on maintaining a large number locker banks will require huge investment.

6.3.3. Collection Points more closer to residential area  
Currently collection points are located to superstores, which are often located a bit far away from residential area. Collection points at nearby store such Pressbyrå will provide additional convenience by reducing distance. The participants in the focus group argued it would be really good for them if there is a collection at the university campus, where thousands of student live.

To provide this service, 3PL service providers will require to establish more collection points and to establish more collection points these company will to do partnership or business agreement with many other companies/small stores. This process might take long time and more operation cost. Customers might need to pay more for delivery fee.

6.4 Summary of the chapter  
In order to enjoy the convenience of shopping online, all of the participants want home delivery. But in home delivery, the problem arises as customers require to present in person to receive goods from delivery person. The alternative options for delivery services described above have both advantages and disadvantages for both 3PL service providers and customers. Collections points have some advantages for 3PL companies such as delivery of large amount of goods at a time to collection points. However, customers can choose nearby or preferred collection point to pick up goods. Locker banks overcome some problems of collection point, considering 24 hour accessibility most of the participants showed interest to use locker banks. Although, there are different sizes of box available, still locker banks can not fit large size of parcel. Controlled home access method can solve the “not at home problem” and provide more convenience. However due to privacy and security, the participants are not interested to use this method.
7. CONCLUSION AND FUTURE RESEARCH

7.1 Conclusion

To conclude, we found that all the participant prefers home delivery. This is due to the fact that the main purpose of shopping online is to have the product delivered to your home, thus the convenience aspect of online shopping. However, due to the work and busy schedules of customers deliveries are normally done when customers are not at home to receive them. For this customers will have to opt for an alternative solution to make delivery of parcel successful. Our findings reveal selecting a different method of delivery if not at home is influence by some factors. Based on the focus group discussion and interviews, we found that participants were of the common view that parcels should be left in reception box if it small and will fit in. Moreover, it will be convenient for the customer retrieve his or he from the reception box than to go collection point or locker banks. From the focus group discussion, they were of the common view when ordering items which are large in size, collection point will be the best solution. In this case selection of reception box is influence by the size the parcel they buy and whether they have reception box at their apartment or home.

Moreover, we can see that not at home problem of last mile delivery is one of the major concerns 3PL service providers face in the discharge of services to customers. In order to be effective and efficient in their provision of services 3PL service providers have adopted solution to minimize the cost associated with redelivery of parcels when customers are not home. It can be seen from the discussion that using unattended last mile logistics solution have the potential to reduce delivery cost in terms of transportation cost and eliminates redelivery cost hence leading greater efficiency for 3PL service providers. However, 3PL service providers should take a number of factors into consideration before opting for the best appropriate solution. These factors include investment cost, customer density, and customer willingness to use each solution.
But, there were divergent views form the interviews regarding which method they will prefer. We found that five out the nine interviewees will prefer the parcel to be delivered to a collection point for pick up. As said earlier the reason for selecting this solution and not reception box is because they have no reception box or mailbox in their apartment. Apart from that reception box or mailbox and locker banks have size limitation. Three out of the interviewees’ opted for locker banks. They were of the view that locker banks will be more convenient, particularly in relation to 24 hours access to pick up parcel anytime you want, although it comes with issues regarding parcel size limitation. With regards to home access solution only one participant will prefer to use this solution. He argued that the main purpose of shopping online is convenience and having the product delivered to your home. However, based on the focus group discussion and interviews, we found that most of the participants were against home access delivery due to security and privacy issues. However, some of the participant shows interest only if the method is proven secured and matured over time.

Based on the literature reviews and findings the authors have come up with several solutions which might solve the problems faced by customers in last mile delivery and improve customer satisfaction through adding values. Existing collection points are performing well, but it could perform better if collection points are located more closer to residential areas. Similarly locker banks could be established closer to residential areas and public spaces and need to accessible 24 hours. In residential apartment, some secured place such as washing room or a secured room could be used to drop parcel so that delivery person need not enter into apartment. Finally, 3PL and other companies, mentioned earlier in the paper should continue research through engaging customers/users and come up with more secured and better home access solution so that customers might be motivated to use home access method, which will provide ultimate convenience of shopping online.
7.2 Contribution to existing research

The study provide in depth views and experience of last mile delivery from customers perspective. Existing literature lack in depth research on last mile delivery methods specifically from customer perspective particularly on locker banks and controlled home access method. The study provides some in depth customers’ views and expectation about these methods. Besides the study came up with a new solution - Secured room at residential building, which could be an alternative delivery method of Controlled Home Access and solve “Not at Home Problem” through minimizing privacy and security challenges.

7.3 Contribution to Practical Application

The finding of the study provides detailed analysis of some problems particularly ‘not at home problem’ faced by customers during last mile delivery. The study came up with some unique solutions. 3PL companies operating in Sweden could benefit from looking at the problems and the expectation of customers in last mile delivery. The solution and recommendations might provide some useful ideas to both e-commerce and 3PL companies to come up with better and improve delivery solutions. E-commerce and 3PL service providers could consider these solution to provide better delivery service to customers.

7.4 Criticism of the paper

The study could provide better and more reliable result if more primary data collected through survey and interviews to get insight from larger population. Beside, the study could be further improved through conducting in depth interview with representative working in major 3PL providers such as PostNord, DHL, or Bring in Sweden. In depth study about possible solutions might produce better outcome. As the author had no other sources of information or checking the reliability of the survey, there is a possibility of bias in reference to the survey conducted by PostNord.
7.5 Future research

- With this thesis we found out all the participants prefer home delivery due to convenience. However, in most cases customers are not at home at the time of delivery. Therefore considering all of the delivery solution, Controlled Home Access delivery could be best alternative for home delivery when customer is not around. However, the main concern of home access delivery is about privacy and security. So further research is needed in this area to know how the privacy and security could be improved both from the customers and 3PL perspective with collaboration from companies providing this digital locks. Also a studies should be conducted to know the cost benefit analysis of investing in home access delivery. Due to security and privacy issues most of participants are not interested allow home access in future. Rather than participants suggested alternative solution which is Secured room in residential building to drop parcel using one time code. In future feasibility study could be conducted on this suggested solutions.

- Moreover, this thesis was conducted to give insights into different solution used to address not at home delivery problem and which of this solution is preferred by customers. With the prospect for increasing use of unattended last mile logistics solution due to not at home problem, further quantitative (cost) on the subject is needed. Also, customer satisfaction and needs should be taking into account if conducting further research.

- We found that most participants have seen locker banks before but they have no idea about how it works and have not used it before. Some even had no idea about locker banks. It could be the case that Swedish are more used to collection point or locker banks are limited in the market. As it stands know it is difficult to know the number of locker banks currently operational in the Swedish market. We recommend a future research as to why Sweden has been slow in using locker banks as compared to other countries in Europe.
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Appendix

Questionnaire for focus group and interview

1. Why do you shop online? Is it because of delivery to your home, access to abundant product, reasonable prices, less time and location limitation, or what? If yes, how often do you shop online?

2. Which medium do you prefer - offline (buying products from traditional shops) or online?

3. What type of products in terms of costs/perishable or non perishable goods, do you shop online?

4. How much time does it usually take to get the products?

5. How much money usually you need to pay for shipments of the products?

6. How do you usually get the products - e.g. home delivery, collection points, locker box, access to your home. Etc.?

7. If it is collection points or locker banks, then how far and how much time you need to pick up and drop the products/parcel?

8. After you order any products on online, do you get all necessary information about delivery and shipment - e.g. time of arrival, preferred methods such as home delivery, collection points, insurance policy, damage of goods, delay of delivery etc.

9. Which of the delivery mode do you know? Eg. delivery to reception box, delivery box, home access delivery, locker banks or collection points, others?

10. Which of these delivery mode do you normally use or prefer?

11. Do you think using the modes other than direct home delivery gives you more convenience?

12. While delivering your products, do you think about security issues of your products?

13. In absence at your home, what kind of delivery method would you prefer?

14. If you are offered home delivery services, in which you may need to give access to specific area of your home to delivery person, will you accept the offer?