RFID’s Perceived Influence on the Marketing Mix in the Logistics Industry

An exploratory study
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Spring 2015
Abstract

The logistics industry is known to be one of the main players for integrating Radio Frequency Identification (RFID) into their supply chain. By reflecting radio waves, RFID allows any item to become an intelligent part of an organization’s information infrastructure. RFID can create greater efficiency and effectiveness as it provides real-time information, and thus has the possibility to heavily increase logistics companies’ performance.

RFID is also suggested to create marketing opportunities for companies as it facilitates customer value creation. However, little is known of RFID’s true influence on marketing. To fully understand what influence RFID has on marketing, companies must seek insight into what influence RFID has on the four P’s; Product, Price, Place and Promotion. By understanding this, companies can gain an increased knowledge of how to utilize RFID to increase their customer value and hence increase their competitive advantage in the targeted market.

This study investigates what perceived influence RFID has on the four P’s within the logistics industry in Scandinavia. This was achieved by performing an exploratory research, and both primary and secondary data was collected in order ensure the validity and reliability of the study. The primary data was gathered by conducting in-depth interviews together with eight logistics companies located in Scandinavia.

The findings from the interviews conducted suggested that the perception of RFID’s influence on the logistics industry’s offered product is positive. According to the findings, the use of RFID technology improved the logistic solution offered which also resulted in an increased perceived customer value. The findings also show that RFID has a positive perceived influence on price as well as promotion and place.

In conclusion, the authors suggest that for RFID to have positive influence on the four P’s it must not only be successfully implemented into the logistics process, but it also requires the implementing company to reach a certain economy of scale, as well as hold a certain level of expertise about the technology to see the full potential of RFID. If these criteria are met there are several benefits to gain from use of RFID in marketing purposes in the logistics industry.
Acknowledgements

We would like to take this opportunity to express our gratitude to all involved parties that have been a part of making this thesis possible.

We would especially like to express our sincere thanks to our supervisor Dr. Setayesh Sattari and our examiner Dr. Pejvak Oghazi for their guidance and support throughout this study. Their expertise, good advice and encouragement have made it possible for us to fulfill the purpose of this study.

We would further like to express our deepest gratitude to all the companies that have participated in our research, and also the people making it possible for us to get in contact with them. Without their participation, knowledge and help this study would not have been possible.

Ljungby May 2015

Frida Andersson, Sophie Dyvelås and Caroline Hansson
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1 Introduction

The aim of this paper is to investigate RFID’s perceived influence on the Marketing Mix in the logistics industry. In this chapter, a background to this subject and previous research will be introduced to create an understanding of the study for the reader. The chapter will include the following sections: RFID, RFID in the Logistics industry, RFID and Value Creation, Problem Discussion, Purpose, Research Questions and finally the Delimitation of this study.

In today’s market one of the most important aspects to stay competitive is to create a superior value for your customers, and consequently building strong customer relationships. To enable this is one of the most vital parts is Supply Chain Management (SCM). SCM is the channel in which raw material becomes a finished product in the hands of the customer, and all the processes, flows and relations in between (Kotler and Armstrong, 2012). The main responsibility of SCM is, according to Grant, Wong, and Trautrim (2013), to link business functions and processes between companies as well as within companies. Linking companies together will improve and help generate a high performing business model (Grant, Wong, and Trautrim, 2013) and thus it is crucial for both small and medium sized enterprises (SME) as well as larger enterprises to have a well-functioning supply chain (Kotler and Armstrong, 2012).

The process of managing all the physical flows in the supply chain is called logistics (Kotler and Armstrong, 2012). In today’s market, due to aspects such as globalization, it is important for companies and logistics to increase their collaboration throughout the entire supply chain (Grant, Wong, and Trautrim, 2013). Suppliers, customers and other members in the supply chain must strive to improve their relations and work closer together to improve the sustainability of the supply chain, and improve the logistics process (Grant, Wong, and Trautrim, 2013). The effectiveness and efficiency of the logistics process heavily affects the company’s costs as well as customer satisfaction, hence heavily affects the supply chain’s competitiveness (Kotler and Armstrong, 2012).

One way for companies to improve their logistics and thus become more competitive, is to invest in greater and more improved Information Technology (IT). In today’s market, many sophisticated IT system are used and supports companies worldwide in order to
control their flows of material and other processes (Kotler and Armstrong, 2012). There are many technical solutions that can be used in order to improve information communication (Jonsson, 2008) and stated by Grant, Wong, and Trautrims (2013), to improve communication in supply chains, technology is an important factor. One example of such an IT system is Radio-Frequency Identification (RFID) (Kotler and Armstrong, 2012).

### 1.1 RFID

RFID is considered the next step within IT development (Curtin, Kauffman and Riggins, 2007; Tzeng, Chen, and Pai, 2008) and allows any item to become an intelligent and mobile part of an organization’s information infrastructure (Asif and Mandviwalla, 2005; Curtin, Kauffman and Riggins, 2007). Adopting RFID into the Business to Business (B2B) industry started getting common in the year 2004 as a result of mandates in the large retailers as well as governmental organizations. However, RFID is not a new technology; it was first invented during the 1940’s when it was used to differentiate between enemy and ally aircraft during the 2nd World War (Asif and Mandviwalla, 2005). The development and growth of RFID since then, has consequently reduced the cost of the RFID technology (Li et al., 2006), which in turn has resulted in an increased number of applications in different parts of the supply chain (Sarac, Absi, and Dauzère-Pérès, 2010).

Figure 1 shows the three main components of RFID: first the key component is the RFID tag; this is placed on the item that is to be tracked or identified. Secondly, is the reader/writer and antennas, these facilitate the interaction between the tags and the software. Finally the software, this enables the handling of the data gathered by the RFID tag (Asif and Mandviwalla, 2005).
By reflecting radio waves, RFID can, unlike other previous information technologies, interact with its environment without the need of any human involvement (Curtin, Kauffman and Riggins, 2007), unlike for example barcodes, which requires human intervention to scan the each object (Jones and Chung, 2007). In addition, when connected to an internal infrastructure, RFID has the possibility to create greater efficiency and effectiveness as it provides real-time information (Curtin, Kauffman and Riggins, 2007).

1.2 RFID in the Logistics Industry

The logistics industry is known to be one of the main players for integrating information technology into the supply chain (Lin and Ho, 2009). By implementing RFID, logistics providers have the possibility to heavily increase their performance, hence making them more competitive in the B2B market (Tsai and Tang, 2012). According to Tsai and Tang (2012) the larger the risk of loss in tracking, such as for logistics providers, which handle large amounts of goods in the supply chain, the greater the benefits of RFID becomes.

In logistics RFID is used for automatic tracking of goods. From tracking the goods during transportation, to automatically detecting the goods when they arrive at the warehouse, processes in the warehouse, and finally when the goods exit the warehouse (Jones and Chung, 2007).
In the warehouse RFID will automatically identify where all goods are stored and can also contain information about each individual item. RFID can scan many items at the same time, cutting down time, labor, and human error at the same time as it allows for a more effective and efficient process (Jones and Chung, 2007). This result in that RFID can offer considerable cost reduction for the implementing organization (Asif and Mandviwalla, 2005). This process is can be seen in Figure 2.

**Figure 2: RFID Solutions for Asset and Item Tracking**  
Source: Danby Group, 2012

RFID facilitates improved visibility and manages problems such as poor information sharing (Kim et al., 2008). Kim et al. (2008) state that RFID results in an increased profit which also is supported by Tsai and Tang (2012) who propose that the operational performance is very positively affected by the use of RFID.

Of course, the many benefits of RFID do not come without challenges and there are still many concerns regarding the ‘new’ technology (Curtin, Kauffman and Riggins, 2007). The most common and recurring challenges and drawbacks listed with RFID are; the cost of implementation, the complexity of the implementation, and the lack of standardization of the technology (Lin, 2009). However, if implemented correctly RFID can offer lasting advantages and benefits (Lin, 2009) such as enhanced operational efficiency in the supply chain (Ngai et al., 2008; Lin and Ho, 2009).
1.3 RFID and Value Creation

According to Rundh (2008), RFID technology helps create a value advantage in the supply chain. By assisting several logistic processes, it facilitates added value of provided services in the supply chain, creating competitive advantages.

Perceived value comprises the perceived benefit less all associated costs of a product or service (Lindgreen et al., 2012). The competitive advantage is created when a customer perceives a higher value based on the benefits versus cost compared to competing proposals (Kotler and Armstrong, 2012).

Lindgreen et al. (2011) claims that value is not created by only one company offering a product to another, but though the collaboration between these different parties. RFID technology enables this co-creation of value as it allows for an improved relationship between suppliers and customers, as a result of improved information sharing between parties (Rundh, 2008). As explained by Rundh (2008), the relationship between parties greatly influences the extent of a company’s success.

Kotler and Armstrong (2012) state a service firm can create a greater service value by offering, for example, more effective services. This in turn leads to an increased customer loyalty, resulting in increased growth for the firm, which becomes more resilient against other competitive rivals. Hence, by offering its customers the benefits of RFID, a service firm, like logistics providers, can thus create greater value for its customers, and Rundh (2008, p. 111) states that “RFID can be a useful tool in organizations that understand the capabilities and limitations of the technology”.

Additionally, this value created by RFID has been suggested to create marketing opportunities for companies (Rundh, 2008). According to Talib and Hamid (2014), RFID provides accurate and targeted information, making it possible for managers to make more informed and appropriate decisions as well as leading to an increased competitive advantage.

Gaining competitive advantage and winning over more customers by delivering a higher value offer is defined as a customer driven strategy. This can be achieved by companies addressing the four P’s in the marketing mix; product, price, place and promotion (Kotler and Armstrong, 2012). Thus for companies to ensure that RFID technology can
create the added value suggested, they must address RFID in each aspect of the four P’s. The four P’s are explained as; Product reflects the product or service that is offered to the customer. The price is the cost the customer must pay in order to obtain the product. The place refers to all the locations and logistics to make the product available to the customer, and finally promotion is how all the above are communicated to the customer. By blending these four P’s together, the marketing mix can become a tool for creating a strong position in the desired market and a means for companies to deliver their intended value (Kotler and Armstrong, 2012).

1.4 Problem Discussion

The logistics process of a company often accounts for a major part of the total cost of an organization. If, through the use of RFID, a logistics provider can fundamentally reduce the cost of logistics, in addition to improving their services, then this will significantly increase the perceived customer value (Rundh, 2008). This increased customer value is important for companies to become more competitive in their target market, as it leads to more profitable relationships (Kotler and Armstrong, 2012).

It is important for companies to seek to understand how that customer value can be created (Kotler and Armstrong, 2012). This can also be facilitated through the use of RFID as the real-time information retrieved enables an improved analysis of demand, logistics, market segmentation and product pricing (Rundh, 2008). In addition, it is suggested by Rundh (2008), that RFID gives companies the opportunity to truly get an insight into the customers’ demands. Hence, RFID does not only improve the logistics process in the supply chain, but it also enables a great deal of new possibilities within marketing (Rundh, 2008).

To fully understand what influence RFID has on marketing, companies must seek to understand what influence RFID has on each one of the four P’s. By understanding this, companies with an implemented RFID system will gain an increased understanding of how RFID can help them increase their customer value and hence become more competitive in the targeted market.

There is a lot of uncertainty in how the RFID should be implemented and utilized (Cannon et al., 2008). This has led to concerns regarding how reliable RFID technology is (Attaran, 2009) and little is actually known about how the attributes and competitive
advantages of RFID are communicated to the customers and how this affects the four P’s. To the authors’ knowledge, there is a gap within research regarding the amounts of literature and research data that is provided about RFID’s influence on the marketing mix within B2B industries. Thus this study will be conducted to seek knowledge about how logistics companies in Scandinavia perceive RFID to influence the marketing mix.

Through conducting such a research, the authors hope to determine if RFID has a positive influence on marketing. This is an important aspect for both RFID and logistics, which needs to be addressed to provide the logistics industry with more knowledge about RFID’s true influence on the marketing mix and thus decrease current concerns about the technology. By determining the relationship between RFID and marketing, this study hopes to aid companies that wish to obtain more information about what influence RFID can have on their companies and their four P’s.

1.5 Purpose

The purpose of this study is to investigate the perceived influence that RFID has on logistic firms’ marketing mix with a focus on the logistics industry in Scandinavia.

1.6 Research Question

RQ1: What perceived influence does RFID have on the product, in a B2B context, in logistic providing firms within Scandinavia?

RQ2: What perceived influence does RFID have on the price, in a B2B context, in logistic providing firms within Scandinavia?

RQ3: What perceived influence does RFID have on the place, in a B2B context, in logistic providing firms within Scandinavia?

RQ4: What perceived influence does RFID have on the promotion, in a B2B context, in logistic providing firms within Scandinavia?

1.7 Delimitations

There are major differences between applying RFID in a B2B setting and applying RFID in a Business to Consumer (B2C) setting. The B2C industry deals with the end consumer, the private person, and therefore the use of RFID is often hindered by
privacy issues which are normally not as sensitive in the B2B sector. When working
towards consumers, businesses with RFID might experience privacy issues such as
concerns regarding leaking personal information or tracking the private person’s
spending habits and physical whereabouts (Kinoshita et al., 2005). To avoid potential
limitations that privacy issues can have on RFID, this study will focus solely on the
B2B industry.

The logistics industry has been selected as it is an industry on the forefront of the use of
RFID. Furthermore, as this is a bachelor project, there are some geographical
delimitations, thus this paper investigates the logistics industry in Scandinavia, Northern
Europe.

Moreover, due to that RFID is relatively ‘new’ in organizational settings, the market
and the numbers of implementations are restricted, this research is limited based on the
knowledge about RFID, as well as to the application of RFID in logistic providing firms
in Scandinavia.
2 Theoretical Framework

This chapter will present relevant theories in relation to the subject of this paper, and will include the following sections: Supply Chain Management, Logistics, Information Systems and RFID, RFID in the Logistics Industry – Challenges and Benefits, Value Creation and Competitive Advantage, Marketing Mix, and Marketing and RFID.

2.1 Supply Chain Management

Supply chain management is according to Jonsson (2008, p. 470) "planning and management of all activities involved in sourcing and procurement, conversion, and all logistic management activities". He argues that it is crucial for a company to have the right means for SCM to perform successfully and increase competitiveness, and that the company needs to prioritize the right performance variables. Jonsson (2008) additionally discuss material flows and information flows, which are flows that need to be as efficient and effective as possible to be able to increase companies’ successfulness and competitiveness. The material flow involves all material handling, transportation, storage and packing of products from point of origin to point of consumption. It does also involve the material flow back from customers to the companies, for example, if products are defect and needs to be returned. The information flow is regarding the information that is needed for all of the shareholders in the supply chain to be able to meet customer demand. An efficient information flow is required to be able to increase the efficiency of the material flow (Jonsson, 2008).

According to Jonsson (2008) it is crucial for companies to have well-functioning SCM as it is the basis for a firm’s competitive advantage. Kotler and Armstrong (2012, p 381) define SCM as "managing upstream and downstream value-added flows of materials, final goods, and related information among suppliers, the company, retailers and final consumers". SCM has during the last decades become increasingly important and most companies are continuously working to improve and make their supply chain more effective, this to increase their competitiveness and to satisfy service level requirements (Simchi-Levi, Kaminsky and Simchi-Levi, 2008). Simchi-Levi, Kaminsky and Simchi-Levi (2008) explains that there are three important aspects of supply chain management. Firstly, SCM involves every aspect that influences the costs and plays a role in satisfying customer requirements, all the way from the suppliers’ suppliers’ to the
customers’ customers’. Secondly, the main objective with SCM is to become truly cost effective throughout the supply chain, which involves decreasing the costs of everything, such as, transportation, manufacturing, distribution, etc. Thirdly, successful SCM is to in an efficient way integrate all supply chain members (suppliers, manufacturers, warehouses, customers etc.) which will increase the communication and collaboration to improve the overall supply chain performance.

Talib and Hamid (2014) explore critical success factors (CSF) in SCM and conclude that one of the most important CSF is information technology, as it enables the right information to reach the company’s management effectively, which gives them the means and motivation to create more competitive business strategies. Furthermore, they state that it helps the company to profile and segment its supply chain members’, as it removes potential barriers in communication. Tzeng, Chen, and Pai (2008) state that IT is a highly important factor to create organizational value; it can enhance products, processes and entire industries (Porter and Millar, 1985).

2.2 Logistics

As mentioned above, logistics is one of the key aspects of SCM. Kotler and Armstrong (2012) argue that many company managers refer to logistics as means of transportation and warehousing, but in reality it is much more. They mention marketing logistics which is about "planning, implementing, and controlling of the physical flow of materials, final goods and related information from point of origin to points of consumption to meet customer requirements at a profit” (Kotler and Armstrong, 2012, p. 381). Thereby they suggest that one should have customer-centered logistics, which implies that the company shall look into what the marketplace need and then work backward to the suppliers, this to in an efficient way meet the service level requirements set by the customers. “The main purpose of logistics is to supply services or products to customers at the right time, with the right quantity, in the right quality, with the right cost, and at the right place” (Lin and Ho, 2009, p. 369).

Logistics consist of four major functions, warehousing, inventory management, transportation and logistics information management (Kotler and Armstrong, 2012; Jonsson, 2008). These are the functions that companies continuously have to improve and make more efficient in order to stay competitive. Warehousing is an important
aspect for all companies as the production of a product and the orders from customers seldom match. A warehouse is the place where companies store their products after they are produced and before they are delivered to the customer. In recent years warehousing have gone through a major technological change, old material handling methods have been replaced with new, often computerized, systems that require fewer employees and provide a more efficient and effective warehousing environment. Thus, affect the customer satisfaction and meet the service level requirements more often. All of the products that are held in warehouses and in stock are referred to as inventory, while inventory management is the firm’s ability to plan how much inventory that is needed to satisfy customers and deliver as promised (Jonsson, 2008). Too few products in inventory most often lead to inability to deliver, and too many products in stock results in unnecessary costs of inventory and warehousing. Therefore, it is crucial for a firm to always have well-planned inventory management that will make it possible for them to provide the customers with the products needed, at all times (Kotler and Armstrong, 2012). Handling inventory might one day be completely automated, for example; the use of RFID technology makes it possible to keep track of all products at all times (Ngai et al., 2005; Lin, 2009). Through this system one can see where a product is in the supply chain and furthermore see exactly when it is time to reorder. Thus, be able to make a more accurate forecasting and develop a more efficient and flexible delivery system (Kotler and Armstrong, 2012).

Transportation is also a major factor in logistics, the means of transportation will affect the price of the product, delivery performance and the quality of the product being delivered. The most common ways of transportation are; trucks, railroads, air and water carrier, and depending on how fast the delivery needs to be executed or how price sensitive the company is the different alternatives of transportation will be suitable for different purposes (Kotler and Armstrong, 2012). All supply chains are greatly in need of on information, the different members of the supply chain need to be able to communicate to create a well-functioning supply chain (Jonsson, 2008). Fast flowing, accurate and real time information is crucial to be able to generate a supply chain that can truly meet customer needs in an efficient way. Thus, maintain and improve their competitiveness (Kotler and Armstrong, 2012).
To clarify, the logistics industry is highly dependent on the ability to deliver as agreed upon, this to uphold a competitive advantage. Furthermore, the companies also need to be able to share information between the point of origin and the final endpoint in order to satisfy customers and meet their demands (Jonsson, 2008). Jonsson (2008) also express that logistics is a means of competition. He suggest that in order to create competitiveness for a company it is crucial that the right type of logistics solutions are performed and that the right solutions are given priority, this to be able to turn efficiency into effectiveness. Companies have to evaluate where they, in the most beneficial way, can store, handle and move their products. Thus be able to make their products available for the customers when needed (Kotler and Armstrong, 2012).

### 2.3 Information Systems and RFID

Information exchange is essential to create a successful supply chain (Jonsson, 2008; Talib and Hamid, 2007) and to in a competitive way work with logistics (Kotler and Armstrong, 2012). The methods and technological solutions available for information communication are many and perform in different ways. Some are only developed to exchange information between stationary units or mobile units. Several systems are developed to enhance spontaneous and unstructured information, others developed to enrich routine and structured information, and some are develop to enhance a mix between the two. To gather information, identification systems are used to collect data, identify entities, capture information about the items and then through an atomized process transfer this information to a computer system. Furthermore, identification systems differ in how much and what kind of information they can carry, and to what extent they can operate automatically. This makes some of the identification systems more appropriate in some situations than others. This also creates a large cost difference between the various kinds of information identification systems available for the implementer (Jonsson, 2008).

The most common identification system is the barcode system, which consist of bar-codes and the bar-codes readers (Jonsson, 2008). But there are other available offers that are gaining market share. RFID is referred to as the next generation bar- codes by Thiesse et al. (2011), and is a fairly new identification system on the market. In comparison with bar- codes the RFID technology can store considerably more data, one can read an object with a RFID tag in real time, several times, and identify numerous
units from a distance at once (Jonsson, 2008; Bunduchi, Weisshaar and Smart, 2011). Even though RFID technology has been around for decades (Asif and Mandviwalla, 2005) there is still a lot of uncertainty about adopting this solution in supply chain management (Cannon et al., 2008). However, previous research shows that RFID technology, which is implemented in a successful manner within the supply chain, will generally enhance a more beneficial supply chain for its members (Hazen and Byrd, 2012; Ustundag and Tanyas, 2009; Fries et al., 2010; Sari, 2010). It is suggested that RFID systems are a superior solution for firms within the logistics industry and it is also argued that RFID will increase the competitive advantage of the adopting firm (Lin and Ho, 2009). The technology can provide benefits such as increased efficiency, effectiveness and visibility for all parties involved (Bunduchi, Weisshaar and Smart, 2011; Tzeng et al., 2008).

2.4 RFID in the Logistics Industry – Challenges and Benefits

There are challenges and benefits with RFID technology in the logistics industry and there are five noticeable areas that cover these throughout the literature; cost, technology, infrastructure, global standardization and security. In this chapter, the benefits and challenges of these areas will be presented.

2.4.1 Cost

Attaran (2012) suggest that all companies within the transportation and logistics industry should have a clear understanding of the importance to strive for a decrease in costs, improved services and efficiency as well as increase in return on investment (ROI) throughout the entire supply chain. It is suggested that RFID can help with all of this. When RFID technology is properly implemented it can give a high return on investment (Attaran, 2012; Oghazi, 2013), as the implementation enhances the efficiency and effectiveness throughout the supply chain (Erickson and Kelly, 2007; Ustundag and Tanyas, 2009; Attaran, 2012; Bunduchi, Weisshaar and Smart, 2011; Tajima, 2007). Several authors also suggest that RFID will help increase companies overall performance, which in turn will lead to a decrease in total supply chain costs (Oghazi, 2014; Sabbagh and Vaidyanathan, 2008; Sari, 2010; Ustundag and Tanyas, 2009). This advocates that a logistics company will not only help its customers decrease their total supply chain cost but they will also decrease their own costs by becoming more efficient and effective.
However, the cost is also presented as one of the main obstacles when adopting RFID, as it is difficult to realize the entire cost of the technology. Lin (2009) discuss the issue of the high cost and that the price increases when the complexity of the RFID technology gets higher, i.e. the more detailed information a company wish to gather to obtain more benefits, the more tags they need and the quantity price gets higher as the technology becomes more advanced. There are several costs included in the adoption and use of RFID. Lin, (2009) proposes that there are six different costs; system establishment costs, maintenance costs, integration costs, customization costs, training costs, and operation costs. And according to Lin’s research, the firms within the logistics industry are hoping that RFID will get standardized to lower these costs. Furthermore, it was highlight that, when the cost of the RFID system is high, the ROI will decrease, and this will in turn influence the willingness of companies to adopt the technology. It is important to be aware of that the calculation of RFID not always is a straight forward, that the benefits of RFID is nothing one will see right away, the benefits are according to Attaran (2012) something that will appear by time. Lin (2009) also suggests that a cost-benefit evaluation needs to be performed, analyzing several situations. This will increase firms understanding of how and if they should utilize a RFID solution.

2.4.2 Technology

According to Lin (2009) RFID is one of the latest innovative technologies within the logistics industry. Even though RFID technology has been around for decades (Asif and Mandviwalla, 2005) there is still a lot of uncertainty about adopting and utilizing this solution in logistics and supply chain management (Cannon et al., 2008). There are concerns regarding the reliability of RFID technology. According to Attaran (2009) failure rate can be as high as 20-30 percent which in turn has affected the reliability of RFID and its quality. He also states that some materials may affect the performance of the RFID. For example, if it is attached to a metal object (Attaran, 2012), or in a liquid environment, this might disturb the performance of RFID technologies (Oghazi, 2014; Sarac, Absi, and Dauzère-Pérès, 2010).

Moreover, RFID technology has benefits that other solutions do not have. The increased efficiency and effectiveness can be the result from many reasons, for example due to automation of reading RFID tags, which helps optimizing the work flow (Bunduchi,
Weisshaar and Smart, 2011; Tzeng et al., 2008) and reduce time (Attaran, 2009), the reduced time spent on manual processes will in turn reduce labor costs, and minimized human made errors (Lin, 2009). It can also be the result of the increased visibility (Sarac, Absi, and Dauzère-Pérès, 2010), which gives the possibility to obtain accurate information of what is where, in what quantities, at all times. Which is a key in supply chain management (Erickson and Kelly, 2007; Mostaghel et al., 2012) and superior logistics performance as the application includes positioning systems, automated vehicle recognition, and other monitoring capabilities (Lin, 2009). Additionally, Ngai et al. (2005) and Lin (2009) argues that RFID applications can generate the possibility to keep track of container locations, increase the visibility through operation data and improve controls of processes.

RFID tags provide a lot more information and help logistics management share more information along the logistics process (Asif and Mandviwalla, 2005) and this facilitates for a more effective communication between the parties involves (Tzeng et al., 2008; Kärkkäinen, 2003; Tajima, 2007), as the information gathered through RFID is more accurate (Sarac, Absi, and Dauzère-Pérès, 2010; Tajima, 2007; Attaran, 2012). However, there are challenges with this vast amount of information generated, it is hard to implement an efficient and well-functioning system that sort through all of this data. Attaran (2009) says that these data and software issues make it hard for the organization to extract the information that can be of value, additionally, react to the data gathered in real-time.

2.4.3 Infrastructure

According to Tsai and Tang (2012) there is a clear linkage between RFID adoption and operational performance. To adopt RFID technology and utilize it successfully it is important to have governmental support, power structure, process flexibility and top management support (Tsai and Tang, 2012; Lin and Ho, 2009). Furthermore, it is vital to increase technological knowledge about RFID among logistics companies, which may help increase the willingness to adopt RFID technology. This can be done by adopting technology related to RFID as it increases logistics companies’ abilities to later adopt RFID technology according to Lin and Ho (2009). From the study made by Lin (2009) the low adoption rate can be due to governmental regulations, only a few logistic companies in China have adopted RFID even though many are interested in
implementing the technology. A similar study that was performed in Taiwan showed similar results where only a few logistic companies use RFID technology even though many are interested. This is a result from that there are no governmental support for the solution and is therefore also hard to implement for companies (Lin, 2009). To improve the use of RFID technology where the technology have not yet been properly introduced, both logistic companies as well as RFID system providers need suitable strategies to speed up the implementation process and change governmental approaches against RFID technology (Lin and Ho, 2009).

Several authors also highlight the importance of being aware of that RFID implementation is different for every company, and is integrated into companies’ differently configured logistics processes and supply chains for various reasons (Attaran, 2009, 2012; Pfahl and Moxham, 2014; Sabbaghi and Vaidyanathan, 2008; Cannon et al., 2008; Sari, 2010; Kärkkäinen, 2003). Lin (2009) states that the infrastructure is a major concern, as all the members of a supply chain need to adopt the same kind of technology in order to gain the real benefits with the system. Furthermore, it is stated that there is a possibility that all companies adopt different RFID solutions with various standards. This creates challenges for companies’ within the logistics industry, as it will be hard to meet all companies different needs, as they might not have the technology compatible with all different kinds of RFID standards.

2.4.4 Global Standardization

Within the logistics industry a growing number of companies recognize that RFID is becoming a major force in the global supply chain visibility and that RFID will improve the tracking process of goods worldwide (Asif and Mandviwalla, 2005). However, there is a lack of international standards of RFID (Sarac, Absi, and Dauzère-Pérès, 2010), governments from different parts of the world regulate the use of RFID in different ways and there are places where it does not work at all (Attaran, 2012). There are also differences in the technology itself, like in what kind of radio frequency that is being used (Sarac, Absi, and Dauzère-Pérès, 2010).

Since RFID is growing within the logistics industry, the importance of international standards is stressed. Not having international standards for RFID tags is a problem within the globalization process (Sarac, Absi, and Dauzère-Pérès, 2010). Globalization
has affected logistics companies’ choices when deciding upon to use RFID as a part of their corporate strategy (Lin and Ho, 2009). However, the global standardization is on the right track. Angeles (2005), explains that EPCglobal, a nonprofit organization was established 2003 to support the global standardization of RFID. EPCglobal’s goal is to; “develop industry-driven standards for the Electronic Product Code (EPC) to support the use of RFID in today’s fast moving, information rich, trading networks” (EPCglobal, 2015).

2.4.5 Security
As RFID solutions are not standardized (Kärkkäinen, 2003; Cannon et al., 2008) it emerge inter-organizational resistance against the use of RFID due to uncertainty and the sharing of sensitive information (Thiesse et al., 2010; Pfahl and Moxham, 2014). There is according to Bunduchi, Weisshaar and Smart (2011) evidence for concerns regarding staff privacy, as one can see where products are at all time, one can also follow the workers. However, as RFID help to increase the visibility within logistics processes and supply chain management, it decreases the amount of lost items (Bunduchi, Weisshaar and Smart, 2011). Moreover it facilitates for more correct controls and the tracking and tracing ability allows for lower inventories (Kärkkäinen, 2003). Attaran (2012) also suggest that RFID enables for improved quality controls and increased reliability in the goods being transported.

Attaran (2009) also discuss the challenges with data hackers, that have the knowledge to forge RFID tags for high-value goods, which is a major security concern for the companies that are using RFID solutions. He suggest that new RFID tags should be introduced that are impossible to counterfeit.

2.5 Value Creation and Competitive Advantage
When looking at the benefits and challenges of RFID it becomes clear that RFID can assist companies by creating a supply chain with a value advantage, as it helps the company in several areas and processes when the RFID technology is properly implemented.
Kotler and Armstrong (2012) argue that the key to build customer relationships is to create a superior value proposition for the customer and to deliver as agreed upon to create satisfaction. Customer- perceived value is the result of when the customer considers pros and cons in relation to the price of the market offering and in relation to similar offers from competitors. They also suggest that most customer do not decide on what to buy in an objective and exact way, instead they act on the perceived value of the goods or services being offered. Lindgreen et al. (2012) argues in a similar way that there are two distinct aspects regarding value; the value of the goods and services, and the value of relationships. The first aspect; value of the goods or services, is about the perceived benefits minus the all costs related to the offer. The importance of understanding that not all customers’ choose the offer that has the highest perceived value is also highlighted. They provide an example that illustrates that buyers might have a budget or other restrictions to follow while purchasing goods or services and are therefore not able to choose the alternative that they perceive most valuable. The second aspect; value of the relationships, suggests that one can perceive value in the relationships between the parties involved and not only the value of the product or service itself, i.e. the parties will through a close relationship be able to generate superior value together (Lindgreen et al., 2012). Furthermore, through a closer relationship one will increase the possibility to in an effective way communicate. This may enhance the company’s ability to determine where the true customer value lies and therefore become more competitive. By determining what the targeted customers’ value and understand why they value just these attributes the company will be able to develop their offers to truly create superior value propositions and through a customer driven strategy gain competitive advantage (Kotler and Armstrong, 2012).

2.6 Marketing Mix

When a company truly understands its customers they will have the knowledge needed to design a customer- driven market strategy. According to Kotler and Armstrong (2012) the goal with this strategy is for the company to discover, attract, maintain, and grow targeted customer segments, and this will be done by producing, providing and communicating superior value to current as well as prospective customers.

When a company is working to develop a customer- driven market strategy a company need to know what customers that they will serve and what their value proposition
contains. When selecting what customers a company wants to serve, they need to divide the market into segments and select the segments that they want to target in the future. Market segmentation is the process of separating a market into smaller groups that have similar needs, characteristics and that require similar kind of goods or services. A customer segment, which companies are recommended to target, is the one group of customers that behave and respond in similar ways to the company’s marketing and offerings. Most often, companies choose to target customers that they know can be satisfied by their goods or services and that are profitable. The firm’s value proposition is the benefits and values the company promise to deliver to their customers. It is suggested that companies need to have a superior value propositions in comparison to their competitors in order to gain the greatest competitive advantage in their targeted segments. The firm needs to, through their value proposition, differentiate themselves from other firms in the same industry. Furthermore, it is crucial that the company has a clear idea of how they want to position their services or/and goods. When companies are deciding on how to position themselves, it is important that they position themselves in a way that will distinguish their offering from competitors in the same industry, and through this they will hopefully gain a competitive advantage (Kotler and Armstrong, 2012). Furthermore, it is suggested that it is significant for the company to monitor and manage competitors’ reactions to its marketing strategy (Oghazi, 2009), as marketers usually work to develop unique market strategies and market positions (Kotler and Armstrong, 2012).

When a company has determined an overall marketing strategy, they are now prepared to develop an appropriate marketing mix (Kotler and Armstrong, 2012). The marketing mix is referred to at putting the marketing planning into practice (Goi, 2009). Furthermore, Grönroos (1994) suggest that the marketing mix is a powerful marketing tool as it simplifies the organizations marketing activities by separating them from the organizations other activities. The marketing mix consists of four marketing tools, the four P’s; product, price, place and promotion, which firms combine to influence the demand of their offered product or service, and to reach the targeted market (see Figure 3). The first P, product, is the product and service combined that are offered to the customer and can be seen as the customer solution. Secondly, price, is the total cost the customer must pay to obtain the offering. Thirdly, place, is all the locations, logistics,
and all other activities that is required in order to make the product accessible to the customer. And fourthly, promotion, is how all the above is communicated to the customer in order to sell the product (Kotler and Armstrong, 2012). Decisions regarding one P in the marketing mix will impact the other P’s in the marketing mix, i.e. if you make a decision about the product, it will have an impact on the price, place, and promotion (Goi, 2009).

![Figure 3: The Four P’s of the Marketing Mix](image)

Source: Kotler and Armstrong, 2012 p. 76

Goi (2009 p.2) states; “The marketing mix is not a scientific theory, but merely a conceptual framework that identifies the principal decision marketing managers make in configuring their offerings to suit consumers’ needs". According to Kotler and Armstrong (2012) a company needs to mix the four aspects of the marketing mix in order to achieve their marketing objectives, position themselves and deliver superior value to the customer. The four P’s in the marketing mix are the key areas in which marketers must contrive, in order to in a successful way handle the exchange of goods, services and ideas in a manner that will satisfy their customers’ needs in a more competitive way (Zineldin and Philipson, 2007).

Moreover, the marketing mix is seen from a company perspective and not from the customers point of view, when the four P’s are translated into the customers perspective they become 4C’s, product- is the customer solution, price- is the overall cost to gain
the solution, place- how convenient the product or service is to gain access to, and promotion- how the solution is communicated (Kotler and Armstrong, 2012; Goi, 2009). It is suggested that marketers shall look into the four C’s before working on the 4P’s as the customer- perceived value is the major determinant if they will finalize a purchase or not (Kotler and Armstrong, 2012).

Furthermore, Zineldin and Philipson (2007) are in their research suggesting that the four P’s also contains aspects of relationship marketing. They discuss relationship marketing as one of the oldest approaches to marketing, and that the aim of this marketing method is for a company to create superior customer relationships from the very beginning and through this satisfy, attract, and keep customers. In relation to the 4P’s it is suggested; that the value of a product or service is affected by to how complex and good the relationship between the seller and buyer is, the better the relationship the more value the customer sees in a firms offering. When talking about Price, it is important to see every single relationship as an investment for the company, if a company take care of the relationship it decreases the risk that the customer will terminate the partnership. Moreover, Place, is according to Zineldin and Philipson (2007) an important aspect and has to be thoroughly evaluated so that the distribution system or place generate superior value. It is also stressed that this is such an important aspect due to that this is where the company actually get in direct contact with the customer. Thus, the decisions made within this area will influence the way customers perceive the company. Lastly, Promotion is so much more than just communicating features and benefits of the products or services, it is about gaining access to individual customers, obtain and in a professional way store information about them. The knowledge obtained will then make it possible to become more effective when performing promotion activities.

2.7   Marketing and RFID

Companies that adopt new technology, such as RFID, need to overlook their existing marketing strategies and make changes that are suitable for the newly adopted technology (O’Callaghan, Kaufmann and Konsynski, 1992). According to Rundh (2008) new technology can be a tool for a more efficient data analysis. Furthermore, it can support marketing activities as well as create new marketing opportunities, i.e. based on the information collected they might be able to improve their marketing mix (the four P’s). Furthermore, when developing the customer driven marketing strategy it
is important to look into the different aspects of RFID. Even though information collected from RFID technology can create opportunities, it can also create challenges for the customer privacy, such as customers that might need their information to be private, and some of their products untraceable (Rundh, 2008; Oghazi et al., 2012).

Logistics marketing channels can decrease customer uncertainty by having information technology such as RFID (Walton 1994; O’Callaghan, Kaufmann and Konsynski, 1992). According to Walton (1994) information technology that provides information enables all actors in a logistic process to reduce the perceived uncertainty. Every actor will be able to share information along the logistic process and between the different parties, which can provide marketing opportunities (Rundh, 2008). Moreover, the logistic process on its own would not create new marketing opportunities; the collaboration between the marketing management and the logistics process could potentially create opportunities (Gimenez and Ventura, 2005; Walton, 1994; Vijayasarathy and Robey, 1997).

According to Jonsson (2008) the utilization of RFID can in a logistics company maintains and increases the firm’s competitive advantage. Kotler and Armstrong (2012) discuss that logistics are given more emphasis today than earlier. Customers of a logistics firm can increase their competitive advantage by improving their logistics management, increase their cost savings, and provide their customers with better service to a lower cost, hence increase the perceived value of their offerings. Additionally they discuss the improvements of information technology and RFID, and suggest that this has created new opportunities for major improvements in distribution efficiency and the management of goods and information throughout the supply chain. Furthermore, information sharing is of high value for some customers, according to Jonsson (2008) all information about a customer’s goods that are being handled, stored or shipped by a logistics company provide added value for the customer. Information technology provides real-time information for the actors and increase the customer- perceived value as the company will be able to improve their responsiveness towards customer’s demand, which is according to O’Callaghan, Kaufmann and Konsynski (1992) a significant competitive advantage. Moreover, Talib and Hamid (2014) states that RFID enables for the right information to be targeted, providing managers with the information needed easily. This information can in turn help management increase the
competitive advantage of the firm and moreover aid the organization to become more resilient and better respond to customers’ needs and wants (Sabbaghi and Vaidyanathan, 2008).
3 Methodology

This chapter will include the methodological procedures conducted in order to fulfill the purpose of this thesis. The chapter will include the following sections: Research Approach, Research Design, Data Sources, Research Strategy, Data Collection Method, Data Collection Instrument, Sampling, Data Analysis and Quality Criteria.

3.1 Research Approach

The following section will demonstrate the research approach that has been applied to this thesis in order to fulfill its purpose. This includes, and will elaborate on a deductive, qualitative research approach.

3.1.1 Inductive versus Deductive

When conducting social science research there are two ways in which the relation of data and theory can be approached. The first type of research is based on empirical observations, where data is first collected and upon which theories are induced. This approach is called inductive reasoning and is normally applied when there is little prior knowledge about an area, and thus the empirical findings are used to improve existing, or create new, theories (Ghauri and Grønhaug, 2005). The second and the most commonly applied approach is deductive reasoning (Bryman and Bell, 2011). This approach deduces hypotheses based on already existing literature and theories and logical reasoning, and then aims to prove or disprove those hypothesis through empirical testing (Ghauri and Grønhaug, 2005).

As this paper provides a theoretical framework which is based upon prior literature and research data in the field of RFID, and Marketing, a deductive approach was applied to this study. Through logical reasoning of the existing literature and research data, research questions, that reflected the purpose of the study, were deduced, and later investigated, to finally provide relevant and reliable findings upon which a conclusion could be drawn.

3.1.2 Quantitative versus Qualitative

Based on the ontology and epistemology of social science, a research can generally be carried out with either a quantitative or a qualitative approach. While the quantitative approach could be seen as placed on one side of a spectrum; based on positivism and
objectivism, the qualitative approach can be placed in the other; based on interpretivism and constructivism (Bryman and Bell, 2011).

The quantitative approach strives to apply natural science research methods onto social science research. This entails standardized procedures, focusing on quantifying large amounts of data, to provide clear and definite facts, to prove or disprove hypotheses (Bryman and Bell, 2011). This is normally done through for example surveys and other similar methods, which can be sent to a large sample group in order to retrieve enough information in order to quantify the data to provide a statistical analysis and results (Malhotra, 2010).

A qualitative research views social science research based on interpretivism that requires a deeper understanding and interpretation of a problem. As this approach explores a deeper understanding of a subject, it leads to a more contextual understanding within the area of research. Since this type of approach focus on in-depth information, a common procedure to conduct a qualitative research is often through for example focus groups or qualitative interviews (Bryman and Bell, 2011). This also results in a much smaller sample size and also a less structured data collection method (Malhotra, 2010). The differences between Qualitative and Quantitative research are summarized in Table 1.

<table>
<thead>
<tr>
<th>Qualitative Research</th>
<th>Quantitative Research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective</strong></td>
<td>To gain a qualitative understanding of the underlying reasons and motivations</td>
</tr>
<tr>
<td><strong>Sample</strong></td>
<td>Small number of non representative cases</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Unstructured</td>
</tr>
<tr>
<td><strong>Data analysis</strong></td>
<td>Non-statistical</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>Develop an initial understanding</td>
</tr>
</tbody>
</table>

**Table 1: Qualitative Versus Quantitative Research**
Source: Malhotra (2010, p. 171)
The qualitative research procedure can be classified into an either direct or indirect approach. The indirect approach conceals the purpose of the study for the respondent, and keeps it disguised for one reason or another. The direct approach unveils the purpose of the study unless obviously apparent. When the direct approach is chosen the two main techniques are focus groups and depth interviews (Hultman et al 2008; Malhotra, 2010).

This research applied the qualitative direct approach to carry out the purpose of this paper. Furthermore, a depth interview technique was chosen in order to provide in-depth information and research data, regarding the perceived influence of RFID on the marketing mix. This can be motivated by the need to retrieve enough information to gain a contextual understanding of an otherwise fairly unknown area of research. Moreover, to make it possible to retrieve information of the perceived influence, a qualitative, interpretative, approach was the only suitable approach to fulfill the purpose of this study.

3.2 Research Design

The research design disclose a framework for the study, what type of data collection should be carried out, what priorities the researcher has, and a plan for how the analysis should be conducted. In this section, the problem of the research is reflected, and depending on if the problem structure of the research is structured or unstructured, there are three key research designs to choose from (see Table 2). The research design that is chosen will determine how and what data should be collected and if chosen wisely, it will retrieve the information needed to answer the research problem in the in the most efficient, and best manner (Ghauri and Grønhaug, 2005; Oghazi et al., 2012).

<table>
<thead>
<tr>
<th>Research design</th>
<th>Problem structure</th>
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<tbody>
<tr>
<td>Exploratory</td>
<td>Unstructured</td>
</tr>
<tr>
<td>Descriptive</td>
<td>Structured</td>
</tr>
<tr>
<td>Causal</td>
<td>Structured</td>
</tr>
</tbody>
</table>

Table 2: Showing the three classes of research design and its problem structure
Source: Ghauri and Grønhaug (2005, p.58)
Descriptive design is defined by structure, rules and exact ways of doing things. According to Ghauri and Grønhaug (2005) the data collection of a descriptive design must be as precise as possible and the variation of collection as small as possible. That means that the problem that is to be solved by the research needs to be clear and well defined, as the measurements and classifications. This research design leaves nothing to chance (Ghauri and Grønhaug, 2005).

The Causal research design is also, as the previous design, structured, but differs in the way that this design instead measures the cause-and-effect in research. An example of a causal research design would be to measure the cause-and-effect of caffeine and its energizing effect on humans (Ghauri and Grønhaug, 2005).

Exploratory research is the most flexible of the three research designs. As it is unstructured, it allows the researcher to have a more or less known research problem, and allows the researcher to follow any new potential lead that is found, and can be important to the study. As data is retrieved the answer to the more or less known research problem, will simply unfold gradually until the problem can be fully answered. This requires the researcher to have great abilities in areas of observation, information retrieval, and hypothesizing (Ghauri and Grønhaug, 2005; Oghazi et al., 2009).

As this research assess a rather unknown area of RFID; the perceived influence of RFID on the marketing mix in B2B industries, it required the research to remain flexible in order to answer the research problem. Prior information regarding RFID’s effect on industries was addressed in order to gain a better understanding of the research problem. The problem was addressed through, as mentioned, depth interviews; this allowed the research to retrieve the information needed to answer the problem, and also to observe the problem, giving a deeper understanding, which enabled a richer theorizing and analyzing process, hence this study is of an exploratory nature.

### 3.3 Data Sources

In order to fulfill the purpose of this study, two types of data sources was used; primary data sources and secondary data sources.

Secondary data is data that has already been researched and published by others. This data is particularly good to help a researcher better understand the area of interest and
thus help the researcher formulated a better defined research problem. The main advantage with secondary data is that it allows the research to gain that understanding about an area, yet requires little time and money in order to fulfill its purpose, compared to primary data (Ghauri and Grønhaug, 2005).

Primary data is data that is collected by the researcher self, in order to answer a particular research problem. This data can be collected in several ways, but there are mainly three ways of collecting primary data; through experiment, observation, and communication (surveys or interviews). Although this type of data collection is more time consuming and costly for the researcher, the main advantage is that the data retrieved is collected for that purpose in particular, which signifies that the information retrieved is more constant to the purpose and problem of the research (Ghauri and Grønhaug, 2005).

The secondary data used to aid this research was mainly retrieved from published external sources, such as books and articles. The secondary data allowed the research to gain an understanding of the area of RFID and marketing, upon which a framework was created, which helped guide the research and also helped the authors create a well formulated purpose and problem question. The primary data was collected to answer the research problem. The data was collected through personal communication, mainly through depth interviews with the participants of the sample group. Through the use of both primary and secondary data, the study had the possibility to answer and solve the research problem in a systematic and well formulated way.

3.4 Research Strategy

A research can be conducted in different ways depending on the problem and purpose of the research. According to Ghauri and Grønhaug (2005) there are five methods that can be applied; historical review, group discussion, case study, survey and experiment. These methods, which are also referred to as research strategy, can be seen on a spectrum of more or less qualitative and quantitative, where the first three; historical review, group discussion and case studies are on the qualitative side of the spectrum, while the remaining two; survey and experiment are on the quantitative side of the spectrum (see Figure 4).
The first of the five methods is the historical review. By reviewing old reports, records, archives from the past as well as interviewing people, this helps to understand the present and future. All the data is interrogatively reviewed in relation to the purpose of the research. The second method group discussion also referred to as focus groups. This includes not just one participating respondent, but several and the interviewer initiates a discussion among the respondent, of whose opinions are recorded and later analyzed. As it allows for discussion among respondents, valuable information can be revealed, however the interviewer must be aware of the possibility of respondents being influenced by other respondents, such as group pressure, which can alter the outcome of the results.

The third and the last one of the qualitative methods are case studies. This type of method is common when an exploratory or descriptive research is being done, where data cannot be quantified. In the beginning of a case study secondary data is collected through sources such as reports, records and other historical data, much like the historical review. However, differentiates itself by adding additional primary data through personal interviews, observations etc., often from multiple sources, where the objective is to develop propositions or hypotheses. Furthermore, a case study can have four different designs, single case design or multiple case design, of which both can be either holistic or embedded, as is shown in Figure 5 (Ghauri and Grønhaug, 2005; Shah et al., 2010).
The choice of case study design is dependent on the type of research being performed. If the research is addressing a specific case, or a very extreme and unique case then a single case design is recommended, however if the case is not very unique or rare then a multiple case design is recommended. The choice of a holistic or an embedded analysis depends on the number of units being addressed in the analysis. If the research addresses only one single unit then the choice should be a holistic analysis. However if the research address several units within the one area of research then an embedded analysis should be chosen (Ghauri and Grønhaug, 2005).

The fourth method of research strategy is surveys and one of the quantitative methods of research. As we know quantitative methods seek to quantify data by collecting a large amount of data, and surveys does just this. Surveys are a good way to attain for example opinions or attitudes of a sample group or to see a cause-and-effect relationship. A survey can be done either by a questionnaire that is sent out to the sample group or by structured interviews. Dependent on the purpose of a study, a survey can be either analytical or descriptive, and the choice of such will form the research (Ghauri and Gronhaug, 2005).

The fifth and final method is the experiment. The experiment is performed by the researcher on one or several units. The researcher controls and manipulates independent variables to see what effect they have on the dependent variables, which is studied before and after the experiment (Malhotra, 2010).
The choice of the five above mentioned methods is dependent upon several factors. Not only must the researcher ask him/herself what information is needed and how that information can be acquired, but also the research question. For example, if the question concerns how many or how much, a survey would be a good choice, or if the question concerns why or how, a case study might be the method to prefer. The choice of method is also dependent upon if the behavioral events can be controlled by the researcher, and also if the focus lies on a historical phenomenon or a current one (Ghauri and Grønhaug, 2005).

To be able to answer the research question and fulfill the purpose; how RFID influences the marketing mix in the logistics industry, the authors applied the case study research strategy. Since there is little prior knowledge about the perceived influence that RFID has on marketing, a qualitative research approach were preferred, to gain a deeper understanding of the area, thus the two quantitative methods, survey and experiment was eliminated. The historical review was eliminated since the authors needed to investigate a current phenomenon, and the focus group was eliminated due to the risk of influence the respondents could have on each other. The case study allowed the authors to conduct in-depth interviews with several organizations, thus an embedded multiple case design was selected, as the study address the influence that RFID has on all the four P’s of the marketing mix.

### 3.5 Data Collection Method

It exist many varieties of data collection methods that are used for different sorts of research strategies. As the strategy chosen for this paper was an embedded multiple case study research strategy there are several suitable data collection tools to choose from (Ghauri and Grønhaug, 2005). These are referred to, by Blumberg, Cooper and Schindler (2011), as sources of evidence, there are according to them three sources of evidence; interviews, documents and archives, and observation.

Interviews are the most common to use as source of evidence (Beheshti et al., 2014; Ghauri and Grønhaug 2011) and can be unstructured, semi-structured or structured. In an unstructured interview the questions are roughly predetermined (Ghauri and Grønhaug 2011). Often when conducting an unstructured interview, the researcher have key concepts that are used to create questions when the actual interview takes place, or
have one main question that can be answered freely and based on that answer the interviewer creates new questions that follow up on relevant information (Bryman and Bell, 2011). Semi-structured interviews consist of predetermined questions (Ghauri and Grønhaug, 2005), also called interview guide (Bryman and Bell, 2011). The semi-structured questions contain open-ended questions with no given answer, which leads to that the respondents can answer freely with their own formulations and words (Ghauri and Grønhaug, 2005). Moreover, based on the answers given by the respondents the researcher can formulate new questions to gain an ever deeper understanding of the subject in question (Bryman and Bell, 2011). Structured interviews consist of questions with given answers. The researcher asks predetermined questions and then the respondent can choose one of the predetermined answers to respond (Ghauri and Grønhaug, 2005). There are options regarding how to obtain the information through interviews; either they are held in a personal setting, such as face-to-face, or they are held through a less direct approach such as e-mail, postal or telephone (Bryman and Bell, 2011).

Documents and archives can take many forms; letters, internal saved communication, internal reports, schedules, etc. Documents may provide a rich amount of information, however, one should be aware of inadequacies, as for example a letter to one person might not contain the information it would have if it was intended for another person. Furthermore, archival records are usually obtainable through different data bases. Archival information contains sources such as; previous internal research data, internal customer records, customer satisfaction etc. When one need to get in hold of this information one need to consider if the information is useful for one’s research as there can be a vast amount of information available. However, if one can find an archival source that correlate to one’s purpose the information can be very valuable (Ghauri and Grønhaug, 2005).

Observation is when one observes something and is divided into two approaches; direct observation and participant observation. This approach is utilized if you want to gain a greater understanding of, for example, a culture. Even though one can gather a lot of information through interviews or documents and archives, one will never truly gain an insight into how it is in practice. By observing one can gain a deep insight into how a social environment works (Ghauri and Grønhaug, 2005).
To reach the purpose of this study it was decided to mainly conduct face-to-face interviews. However, to increase the possibility to gain the information needed to fulfill the purpose of this paper, telephone interviews were also needed. Furthermore, it was decided to use semi-structured interview questions. This decision was based on that this research is exploratory and it was needed to gain a holistic view of the research problem addressed. This approach allowed a free-flowing conversation between the interviewer and the respondent, and enhanced the opportunity to gather in-depth information that otherwise could have been missed due to a structured interview (Ghauri and Grønhaug, 2005). The semi-structured predetermined questions used were used as a guide and tool to keep the interviews on the right path.

### 3.6 Data Collection Instrument

As mentioned above, the primary data in this study was gathered through semi-structured interviews, both in a face-to-face setting and through telephone. In this section, the authors will discuss these data collection instruments used to gather the data needed to fulfill the purpose of this paper. This section will contain: operationalization and measurement, interview guide, and validation and pretesting.

Before conducting interviews there are many aspects to have in mind. According to Ghauri and Grønhaug (2005) one need to; analyze the purpose of the research, have a clear perception of what kind of information that needs to be gathered, and gain a great understanding of who would be able to provide the information needed. After looking into these three aspects it is possible to develop a successful interview guide (Bryman and Bell, 2011). An interview guide were developed, as suggested for semi-structured interviews, and become the list that contain the specific questions that covered the research area in this study in a structured way. This interview guide allowed the authors of this paper, to stay coherent during the interviews and focus on the purpose of this paper throughout all of the interviews. Furthermore, the interview guide increases the comparability of several qualitative interviews, as it enables for the interviewer to ask the questions in a similar way in all interviews (Blumberg, Cooper and Schindler, 2011; Mostaghel et al., 2015).

When creating the interview guide, the suggested topics to reflect upon by Ghauri and Grønhaug (2005) were used. The purpose of this study was thought of thoroughly, this
to make sure that the information needed would be gathered. Furthermore, it was decided that the people the authors of this paper were interested in interviewing were working at a logistics company within marketing and sales, and that had a clear understanding of what RFID technology is used for.

The interviews were conducted with eight people, which work within sales and/or marketing, supply chain management and business management. Three of the interviews were performed through telephone and five of the interviews in a face-to-face setting.

3.6.1 Operationalization and Measurement

Operationalization is according to Bryman and Bell (2011) the importance of having variables based on the concepts that are based on the subject in questions. These concepts and variables can be developed in a variety of ways, through the questions, through observations of individuals’ behaviors, through the use of statistics and through content analysis.

In this study, the most suitable method was to develop the variables through the questions used in the interview guide, which was based upon previous research. The authors developed their interview guide based on the theoretical framework and the purpose of this paper, as it was important to ask questions that would gather information about the different concepts addressed throughout this study. Based on these concepts there were variables developed that are the focus of the study. The concepts and variables investigated were compatible to the questions asked (See Appendix 3). The concepts throughout this study are: RFID-technology, product, price, place, and promotion, and they were all covered by the interview questions asked as demonstrated in the Operationalization table (Table 3). The table additionally present the variables measured in this study.
### Table 3: Operationalization Table

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Definition</th>
<th>Interview Questions</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID</td>
<td>“Radio frequency identification, collective term for several methods of identifying objects using radio technology” (NE, 2015).</td>
<td>Questions 1-15</td>
<td>Cost, technology, infrastructure, standardization, and security</td>
</tr>
<tr>
<td>Product</td>
<td>“The goods-and-services combination the company offers to the targeted market” (Kotler and Armstrong, 2012 p. 75).</td>
<td>Questions 2, 3, 4, 8, 13, 15</td>
<td>Variety, quality, features, and services</td>
</tr>
<tr>
<td>Price</td>
<td>“The amount of money customers must pay to obtain the product” (Kotler and Armstrong, 2012 p. 75).</td>
<td>Questions 2, 3, 4, 4a, 8, 15</td>
<td>The cost of RFID system by Lin (2009), and list price</td>
</tr>
<tr>
<td>Place</td>
<td>“Includes the companies’ activities that make the product available to target consumers” (Kotler and Armstrong, 2012 p. 75).</td>
<td>Questions 2, 3, 3a, 3b, 4, 8, 15</td>
<td>Locations, inventory, transportation, channels and logistics</td>
</tr>
<tr>
<td>Promotion</td>
<td>“Activities that communicates the merits of the product and persuade targeted customers to buy it” (Kotler and Armstrong, 2012 p. 75).</td>
<td>Questions 2, 3, 4, 7, 8, 9, 10, 11, 12, 14, 15</td>
<td>Communication, advertising, personal selling, perceived customers perception of RFID, and sales promotion</td>
</tr>
</tbody>
</table>

#### 3.6.2 Interview Guide

Before constructing the interview guide, the research problem were reviewed and thoroughly considered, this to gain a deeper and more precise understanding of what kind of information that was needed to fulfill the purpose of this paper. Moreover, the most suitable sample group was decided, this to gain the information needed. After this, the first draft of an interview guide was developed. The questions were compared to the research problem, this to see that they were consistent to what information that was
needed to obtain, but also to see so that the formulation of the questions were good. In this phase of the development of the interview guide the authors of this paper consulted a professional within the area to get her point of view. After this was performed, the suggested changes to the interview guide were applied and the interview guide was then pretested (for further information see; pretesting). When the pretesting was performed and evaluated the interview guide was improved one last time, which resulted in the interview guide that has been used throughout this research (See Appendix 3).

The interview guide used contains 15 questions, however, more questions were asked. The additional questions are referred to as follow-up or probing questions by Blumberg, Cooper and Schindler (2011). Follow up questions are questions used to make the one being interviewed elaborate further by asking questions in relation to the first given answer, for example; Can you please tell me more about this? Probing questions are questions asked that are focused on one specific aspect in the previously given answer for example; Why do you think A affects B? These questions where used to gain a deeper understanding by gathering more detailed information (Blumberg, Cooper and Schindler, 2011).

Further, to improve the reliability of this study, three probing questions were added into the interview guide and descriptive reports after the interviews were conducted. This, since all three questions were recurring throughout all the eight interviews. These questions are marked as a, and b, questions, and are shown in Appendix 3 and 4.

Moreover, the interviews that were performed, either in a face-to-face setting or by telephone, were approximately 30 minutes to 1 hour.

3.7 Validation and Pretesting

To ensure the validity of the interview guide, the authors of this paper consulted a professional that has a PhD in the area of marketing. This person was then enquired to provide expertise in the subject, as she possesses good analytical skills, respectable knowledge about research, marketing, business strategies, etc.

The interview guide was, after being validated, pre-tested. This to ensure the validity of the interview questions and to gain a deeper understanding on how the questions used were perceived, the level of difficulty in the questions, and the willingness to answer,
from the respondents’ point of view. Pre-testing the interview questions also has a role to ensure that the research instrument works well to reach the purpose of the study performed (Bryman and Bell, 2011; Parida et al., 2014).

The pre-testing of the interview guide was performed through the help and expertise of four people, who were carefully chosen to increase the validity of the pretest. Three of the participants have previously been working with RFID solutions and are therefore familiar with the subject. One of these three participants works within logistics and supply chain management, thus where asked to participate. Furthermore, a fourth person was asked to partake in the pretest, as he has expertise within the subject of conducting interviews and performing research.

After the interview guide was sent to the participants they were asked to provide feedback on the interview and the interview questions. Moreover, the respondents were asked questions about the interview guide itself. This to gain a deeper insight into how they perceived the questions asked and if they were perceived in the wanted way, this to understand if the questions were good enough to provide the knowledge and information needed to fulfill the purpose of this paper.

3.8 Sampling

Sampling is one of the most important tasks when conducting a research. The sample that will be used to gather data need to be specified and one also need to specify how this sample group was chosen and why. Ghauri and Grønhaug (2005) suggest that the procedure for drawing a sample is a six step process. First, the researcher has to describe the sample population, by population does not only refer to people, but it can also be firms, organizations, cities, countries, etc. Secondly, the sample frame needs to be identified, a list of all representatives in the population from which the sample will be selected. Thirdly, one needs to select a sampling procedure, whether or not the sample should be a non-probability sample or a probability sample. Fourthly, the researchers are suggested to determine the sample size, how many participants shall be invited to partake in the research. Fifth, one should select the sample units, who shall be invited to participate in the research being performed. Lastly, the researcher shall contact the potential participants for the purpose to gather the information needed.
According to Ghauri and Grønhaug (2005) and Bryman and Bell (2011) there are two extensive sampling procedures that can be utilized, these are; non-probability samples and probability samples. In probability sampling the researchers use a random selection of elements to reduce biased samples (Blumberg, Cooper and Schindler, 2005). Each potential participant has a known chance of being a part of the study (Ghauri and Grønhaug, 2005). Therefore are probability sample more likely to provide a sample that will represent the entire population. With non-probability sampling, on the other hand, there are several ways to determine the population that will participate in the study (Blumberg, Cooper and Schindler, 2005) and it is often not possible to state that the sample represent an entire population (Ghauri and Grønhaug, 2005). Non-probability samples are not been randomly selected, but rather selected for a specific purpose (Blumberg, Cooper and Schindler, 2005). However, according to several authors (Ghauri and Grønhaug, 2005; Blumberg, Cooper and Schindler, 2005; and Bryman and Bell, 2011) non-probability samples often provides great results when carefully selected.

In this paper, a non- probability sample was used. The sampling process used is referred to as purposive sampling, in this process the authors do not want to use a sample that is random. This sampling method was chosen as it is applicable to the problem addressed in this research as it was needed to get a sample that was strategically chosen and relevant for the problem questions asked (Bryman and Bell, 2011).

The sample population was defined and the parameters decided for who was suitable to partake in this study. To find the companies that were relevant and fulfilled the preset parameters an extensive search was made through different internet sources. All of the firms identified were contacted in the same way, through a predetermined and validated e-mail (See: Appendix 1). The companies that had not responded within a two week span received a reminder (See: Appendix 2). Furthermore, some companies were contacted through phone, the validated e-mail was then used as a transcript.

The sample population chosen is; logistics companies located in Scandinavia. The parameters of the logistics companies that were suitable to partake in this study had an annual turnover of 12 million to 3 billion SEK and utilize RFID technology in an everyday setting or have greater knowledge about the technology. The knowledge criterion involved that the company had to be well familiar with RFID, and know what
the technology can provide for them. Furthermore, many of the contacted companies have been looking into RFID solutions for their logistics processes and supply chain management and are therefore knowledgeable within the area. There were a total of 76 companies contacted through e-mail and a total of 18 companies contacted through phone calls, in total 94 companies were contacted for the purpose of participating in this study.

Throughout this paper, the companies without a RFID solution are; Company C–, Company D–, Company E–, and Company F–. The companies that are utilizing RFID are; Company A+, Company B+, Company G+, and Company H+.

3.9 Data Analysis

Opposed to quantitative analysis of data, the qualitative data analysis has no determined approach or classification. Since qualitative research is more exploratory and unstructured, focus is on understanding a subject rather than quantifying it. Thus it is common for a qualitative research to be conducting continuous data collection at the same time as the data is being analyzed, in order to gain a deeper understanding of the subject (Ghauri and Grønhaug, 2005; Oghazi and Philipson, 2013).

Although there is no determined or agreed upon way to perform a qualitative analysis, there are suggestion and helpful advice that researchers can follow to ease the process.

This study followed the guidelines provided by Ghauri and Grønhaug (2005), which suggests separating the following parts of an analysis; data reduction, data display and conclusion drawing/verification.

*Data reduction* was performed, that is, after transcribing the interviews, the data were then reduced through being simplified, more focused, and the most important parts were selected. After which the authors started to identify patterns and generated themes and categories (Ghauri and Grønhaug, 2005).

Secondly, a *data display* was carried out, hence the data was organized in a way that later allowed for conclusions to be drawn. The data display phase followed seven stages; categorization (data is classified through coding), abstraction (creates more general conceptual classes based on the previous categories), comparison (compares all data collected to create guidelines for further data collection), dimensionalization
(exploring the variations in the data to clarify and enhance the conceptual meaning), integration (maps the relationship between different elements), iteration (the process of simultaneously collecting data and analyzing it), and finally the last stage of data display; refutation (subjecting the final data to a critical empirical analysis to avoid ‘confirmation bias’ (Ghauri and Grønhaug, 2005).

The third and final stage was conclusion drawing/verification in which the data that had been collected and analyzed was interpreted upon which conclusions were drawn (Ghauri and Grønhaug, 2005). Furthermore, in order to ensure the validity of the data, all three authors individually interpreted the data retrieved, after which the researchers together discussed their interpretations until the results were unanimously agreed upon. In cases of disagreement, a professional was consulted (Bryman and Bell, 2011).

3.10 Quality Criteria

When conducting a research, one of the most important aspects is to ensure the quality of that research. This can be accomplished through ensuring the validity and reliability of the research, which can be done through several different tests (Oghazi, 2009). The choice of test is dependent upon which strategy is used to conduct the research. According to Yin (2003) there are four common ways to address validity and reliability in social science. These four tests are shown in the Table 4, which also includes the most common tactics of ensuring such validity or reliability when performing a case study.
When conducting an exploratory or descriptive study the internal validity is inapplicable (Yin, 2003), as this test measures whether the independent variables have an effect on dependent variables or not (Malhotra, 2010). Therefore this study did not address internal validity, but instead focused on ensuring the content validity of the study.

### 3.10.1 Content validity

This validity is also referred to as face validity and is important as it indicates whether or not a research measures what it is supposed to measure. This is performed by addressing professionals in the area of research, who examine the research to ensure that the entire field of the subject being measured is covered (Malhotra, 2010). To ensure the content validity of this research the authors consulted a professional within the area of RFID and Marketing. The person that was consulted is a professional in the area and holds a Ph.D. in industrial marketing.

### 3.10.2 Construct Validity

Construct validity ensures that the construct or theory of the research is adequate in its definitions and measures (Malhotra, 2010). That is the data that is retrieved and

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<table>
<thead>
<tr>
<th>TEST</th>
<th>Case Study Tactic</th>
<th>Phase of research in which tactic occurs</th>
</tr>
</thead>
</table>
| Construct validity | • Use multiple sources of evidence  
                    • Establish chain of evidence  
                    • Have key informants review draft case study report | Data collection  
                      Data collection  
                      Composition |
| Internal validity | • Do pattern matching  
                    • Do explanation building  
                    • Address rival explanations  
                    • Use logic models | Data analysis  
                      Data analysis  
                      Data analysis  
                      Data analysis |
| External validity | • Use theory in single-case studies  
                      • Use replication logic in multiple-case studies | Research design  
                                         Research design |
| Reliability  | • Use case study protocol  
                    • Develop case study database | Data collection  
                                 Data collection |

**Table 4:** Frequently Applied Case Study Tactics for Four Design Tests  
Source: (Yin 2003, p. 34)
conclusions that are drawn are dependent upon the already established theories. According to Yin (2003), construct validity can be very challenging to ensure when conducting a case study. However as shown in the Table 4, this can be ensured through three different techniques; use multiple sources of evidence, establish chain of evidence and have key informants review draft case study report.

To guarantee the construct validity of this study the authors conducted eight interviews, with eight different organizations, this ensured evidence from multiple sources. A chain of evidence was established through analyzing all data retrieved. The final step to ensure the construct validity of this study, the authors addressed professionals within the studied field, to conduct a pretest on the interview questions. It was important to ensure that the questions was well formulated and matched the concepts that were being measured. The questions were then adjusted according to the feedback provided.

3.10.3 External Validity
According to Bryman and Bell (2011), external validity is the extent to which research findings can be generalized outside its research context. Although it can be hard to prove external validity in case studies, the table above presents two ways in which a case study follow to ensure the validity; the use of theory in single-case studies and replication logic in multiple-case studies (Yin, 2003).

As this study applied a multiple case study, replication in the data retrieved ensured the external validity. However to further strengthen the external validity, theories regarding the influence of RFID in other parts of logistics, such as benefits and drawbacks of RFID, was addressed to analyze possible similarities with the data that was collected. Furthermore, the questions provided in the interview guide were based upon the same previous research, which thus further strengthen the external validity and thereby also the generalizability of this study.

3.10.4 Reliability
Reliability refers to how stable a measure is, namely the possibility to replicate a study with consistent results (Bryman and Bell, 2011; Malhotra, 2010). Reliability is ensured mainly through the consistency of the data collected; repeatability, and also ensuring that the measures used are free from errors by generating consistent results; internal consistency (Bryman and Bell, 2011; Oghazi, 2009).
The repeatability of this multiple case study could be ensured by the consistency and minimal fluctuation in the data retrieved from the eight interviews conducted. Furthermore, an interview guide was developed and pretested by four professionals in the field to ensure that the measures that were used were free from errors, and by providing the interview guide this can be used as a case study protocol, if the study at a later occasion should be replicated. In addition, to ensure the inter-observer consistency, all data was, as previously mentioned, individually analyzed and interpreted by all three authors, after which the authors together discussed their interpretations, to ensure unanimous agreed upon results.
This chapter contains the research findings. The data was retrieved from eight logistics companies through in-depth semi-structured interviews.

All of the companies are anonymous and are therefore referred to as Companies A – H. The companies have been assigned either a (+) or (–), to clarify throughout the paper, if the companies have implemented RFID or not. Company A+, Company B+, Company G+, and Company H+ are representatives from companies that have implemented an RFID system, out of which, three are utilizing RFID on a regular basis. Company C–, Company D–, Company E–, and Company F– does not utilize RFID, but have the knowledge and interest needed to partake in this thesis. Furthermore, this provides the insight into how the companies perceive RFID’s influence on the Marketing Mix. Moreover, the interviewees work positions are; Business Unit Director (Company A+), Country Manager (Company B+ and Company D–), Marketing Director (Company C–), Vice President (Company E–), Supply Chain Manager (Company F–), Sales Manager (Company G+), and Business Developer (Company H+).

The chapter will include the following sections: Product, Price, Place and Promotion; and a discussion of challenges and benefits of RFID technology with regard to each one of the four P’s.

4.1 Product

Throughout the eight interviews, RFID technology and its popularity has been discussed, many of the interviewees express that RFID is uncommon and has not gotten the breakthrough it was expected to get. Company A+ (2015) do not want to stress into using RFID, even though they are utilizing the technology with one customer they believe that RFID is still too new for most of their customers. Company B+ (2015) says that they never have met a customer that requires that they should use RFID. This is also reinforced by Company C– (2015), who states RFID is more unusual than it is perceived to be in the logistics industry, and believe that this can be a result of the high price and the complexity of the technology. Company C– (2015) continues, if RFID would be cheaper and easier to use, and they think that RFID would become more popular. However, Company G+ (2015) is the one company that states that the main reason for their implementation was to stay competitive, and believe that if they would not have implemented a RFID system the customers would abandon them for their competitors that use RFID technology.
4.1.1 Perceived Challenges of Product

As mentioned above, RFID is more uncommon than it is perceived. Additionally, Company F– (2015) explains that they have never come across a fully implemented RFID system that involves all the members of the supply chain. Company H+ (2015) suggests that they perceive that there are some insecurity regarding RFID technology and its capabilities. It is stated that they believe that a lot of people read about RFID, but it is still uncommon in practice. Moreover, they believe that if there were any RFID standards, both in usability and implementation, then maybe RFID would become more popular.

The lack of standardized RFID tags makes it too difficult and complicated to implement the technology (Company E–, 2015). If there were a standardized RFID solution available, the use of bar codes and EDI, and other systems, would become less popular (Company H+, 2015). Furthermore, Company E–(2015) states that it is also hard to know on what level you should implement RFID technology. Should one mark all products with RFID tags or should a larger box of goods be marked. They furthermore suggest that RFID needs to become cheaper so that one can truly benefit from it.

The perception of price and costs is another factor that has affected the use and implementation of RFID (see; Price in this chapter). Company D–(2015) expresses that they had a customer that wanted to implement RFID to reduce human labor and save money, but that was not profitable for them due to that they had small material flows. This is also supported by Company C– (2015) that suggest that RFID technology is more common and better when transporting sophisticated goods that are of high value and if you for example want to perform temperature controls.

Another disadvantage of RFID technology discussed by Company G+ (2015) is that the system is totally depending on technology to function; what if something happens? The company is in need of a backup system, and this system requires human recourses to work, and as RFID is a tool to reduce the workforce, this is not always that easy.

There is an interest of implementing RFID technology from a logistics company point of view (Company F–, 2015; Company H+, 2015), even though it, according to Company E– (2015) is perceived as unnecessary to implement new technology when it is not needed. Company E– (2015) as well as Company C– (2015) are using bar codes
today, and do not see the point of switching to another technology, as their existing is working well. This is also suggested by Company F– (2015), who states that it does not make any sense to implement new technology when you already have a well-functioning system.

Company C– (2015), Company D– (2015) and Company F– (2015) believe that RFID technology needs to be implemented by a larger actor within the industry to enforce the implementation of RFID throughout the industry. Company C– (2015) says that this would be the reason for them to implement a RFID system. If market leading companies implement RFID, smaller actors have to follow if they want to stay in business (Company D–, 2015; Company F–, 2015).

### 4.1.2 Perceived Benefits of Product

According to Company A+ (2015) the advantages of using RFID is the opportunity to keep a high quality as well as being able to stay organized through keeping track of goods. Company G+ (2015) states that since implementing RFID technology, the company has been more up to date as well as increased their ability to keep up with the customers’ demands and expectations. Furthermore, Company G+ (2015) states that RFID is beneficial for the customers because they will now have the possibility to focus on their core business instead of taking care of logistics, which have strengthened the customer relationships.

Company G+ (2015) suggests that the biggest advantage is that RFID eliminates human errors, increases effectiveness and efficiency, automates inventory as well as saves money and time. Moreover Company E– (2015) implies that, if the company would implement RFID, it would help the company pack better, make fewer mistakes as well as keep track of goods throughout the supply chain and logistics process. This statement is supported by Company A+ (2015), who has the possibility to follow their goods through the use of an RFID tag, which provides a geographical location and have an identity, allowing the goods to be identified. This increases the visibility of the goods throughout the delivery process, and one can by this work to improve processes and increase security. Moreover, the increased visibility will, according to Company F– (2015), make it easier and more efficient to handle large amounts of different goods, especially when receiving goods as this is a timely process.
RFID provides the information that helps prevent situations where products just disappear, as one will be able to address problems that previously have been unnoticed (Company A+, 2015; Company D–, 2015). This perceived benefit is also mentioned by Company F– (2015) that says that the more information they can get about something, the more increased possibility they have to improve those areas. RFID is also used for scanning goods internally in warehouses to increase inventory control (Company G+, 2015; Company H+, 2015). Furthermore, Company A+ (2015) states that by the use of RFID it is easier to load the goods correctly, as one can see all the information needed to do so when scanning the RFID tags.

As customers demand for efficiency and effectiveness goes up, it is important to stay competitive in the market. According to Company E– (2015), the implementation of RFID would allow the company to improve and hopefully still be able keep low prices, which is important as customer in this industry is very price sensitive (Company E–, 2015). They also discuss the possible benefit, that RFID can provide their customers with evidence of that the delivery is performed correctly as this process could be monitored.

The customers need to create a demand from logistics companies that they want RFID before companies will start implementing it (Company E–, 2015). Which is supported by Company B+ (2015), that only use RFID when their customers require it, however they do not provide the entire solution of RFID tagging etc. They are instead focusing on providing them with a solution of scanning their goods if it is needed. They state that “scanning is a service that a logistics company should be able to provide its customers with”. Additionally, Company G+ (2015) expresses that those of their customers that are utilizing their RFID solution are very satisfied with the service it provides.

4.2 Price

Throughout the interviews conducted, there is one criterion with RFID that is recurring, the price of the RFID tag is a perceived challenge. However the general perception among most of the companies interviewed is that even though the initial implementation cost of RFID as well as the RFID tag, are considerably high, there are financial benefits with implementing an RFID system.
4.2.1 Perceived Challenges of Price

Companies in the logistics industry are mainly using barcodes, and according to Company B+ (2015) and Company H+ (2015) barcodes are considerably cheaper than RFID tags. According to Company B+ (2015) and Company C– (2015), the main problem with RFID is the high cost, especially if you are transporting goods of lower value, then it does not make sense to mark them with RFID tags. Company B+ says “A cargo with low value goods such as car tires is not necessary to be able to track or know where it is. Therefore RFID is better for sophisticated products of high value. That is why it is used on art and other products of a high value.” Company A+ (2015) says that the cost of the tags and scanners need to decrease for it to be beneficial, which is supported by Company C– (2015) saying that if the technology was cheaper and easier to use, it would be more commonly implemented. The costs of implementing RFID are very high, not only the RFID tags, but also the hardware and software. According to Company E– (2015) for it to be profitable, the RFID tags need to become cheaper.

RFID is not something that you can charge the customer for; nevertheless it can still be financially beneficial, as a result of money saved on processes in the company (Company H+, 2015). Company D– (2015) however believes that RFID is not something you could make money from. Instead Company D– (2015) describes it like this; in this industry we only sell two things; place and price, and it all comes down to how efficiently and effectively you can handle the goods for your customers. They states that this can be accomplished through means other than RFID, and an example they give is that students graduating from the universities today can simply use their new found skills to cut the warehouse levels in half and hence cut the costs tremendously. Everything will be more efficient, and then all goods will be in constant movement, hence Company D– (2015) do not believe RFID tags would have much influence on the logistics cost. However, the company also says that although they believe that no one will want to pay for RFID, RFID will still be something that will be a requirement in the future, but then as a part of a larger package.

Company H+ (2015), a company which has invested in RFID and profits from the system, says that the reason they think that RFID is still so uncommon is that everyone is waiting for more and better standards within RFID technology. No one wants to be
the first one to invent the wheel, as this is often very costly. Companies therefore have to find a solution where it is worth implementing RFID, and where the volumes are large enough for RFID to be financially beneficial (Company H+, 2015). Also Company D– (2015) pinpoints the importance of volume for RFID to be beneficial, where as their customers do not have large enough volumes for RFID to be profitable.

After the wheel has been invented (Company D–, 2015), and someone takes the initial cost, Company D–(2015) believes that sometime in the near future a copycat product will be produced and the cost of RFID technology will decrease substantially.

4.2.2 Perceived Benefits of Price
Four out of the eight companies that were interviewed have implemented RFID into their logistics process. Three of which can see clear financial benefits with the system (Company A+, 2015; Company G+, 2015; Company H+, 2015). The fourth implementing company perceives the benefits of RFID as being dependent on the value of the product being traced (Company B+, 2015).

Company G+ (2015) says that of course the cost of the implementation was quite high, but you have to weigh the cost against the benefits. Since they implemented their RFID system it has exceeded their expectations (Company G+, 2015). Company H+ (2015) confirms the financial benefits of implementing RFID. Before they implemented RFID they analyzed the costs of the implementation against how much they would be able to gain from using an RFID system. The ROI of their RFID system was very good, as a result of money saved on both reduced errors in the logistics process, as well as money saved on keeping track on their logistics pallets/boxes which are considerably expensive (Company H+, 2015). Company H + (2015) say that since their flows are so big, even a minor error in the warehouse grows and becomes bigger later in the process. For example, if they make one minor error like sending one pallet/box with the wrong truck, then this could later affect up to 60 of their customers’ delivery. So by having RFID system that automatically detects as soon as any error is made, they can instantly address the problem and in that way keep down a vast amount of errors, saving both time and money. Company A+ (2015) also sees financial advantages and benefits since they implemented their RFID system. They also used to lose a considerable amount of money due to that the pallet/boxes that they lost during their logistics process and
transportation. They can now follow their pallets/boxes which have resulted in that their RFID system is paying off. Furthermore, they also see an economical advantage as a result of improved quality of flow, and a more efficient process (Company A+, 2015).

According to Company G+ (2015) the biggest contribution that RFID has made is the change of the human factor and reduced human errors. Their process is now both more effective and efficient as a result of reduced manual handling, which has resulted in that their company saves a large amount of both time and money. Company E– (2015) and Company F– (2015) also see that their logistics process would be able to become more effective and efficient, saving money on manual handling, time, and human errors if they were to implement RFID.

Company E– (2015) states “The only way for us to make more profit is to become even more efficient in what we are doing, become faster, increase the security and keep a high quality. If we can do this we will become more competitive, and this is when we can increase our monetary benefits”.

Company F– (2015) believes that it could also be profitable if they could have an RFID system where their goods are received. If they currently had 10 people working on the goods received, they could with the use of RFID cut that number in half. Further, they believe time and labor could be saved if their inventory could be atomized with the use of RFID.

Company F– (2015) is the only company that has not expressed any major concerns regarding the price of the RFID tags. They believe that the price for the RFID tags has decreased a lot in the past 15 years and that it is not the price that is the major problem anymore, but that the RFID technology is simply too advanced for many supply chains to handle.

Company A+ (2015) believes that their customers are very satisfied with their service and that they use RFID, and has not received any complain about the price. Company C– (2015) state that they would implement RFID if any of their major customers would require it, and that that would also make them willing to pay for the cost. Company F– (2015) believe that if one of their major customers would to implement an RFID system, that it would be beneficial if they could do it together and share the cost, they say that “it would be a win-win situation” Company F– (2015).
4.3 Place

All of the eight companies interviewed perceive that RFID technology is a tool that will make logistics and supply chain management more efficient. However, in what ways and to what extent this efficiency will be noticeable, is discussed differently among the interviewees.

4.3.1 Perceived Challenges of Place

According to Company F– (2015) the main challenge with RFID is that the majority of all members in the supply chain have to implement the technology in order to gain all the possible benefits it has to offer. If not, the company needs to have two parallel processes throughout the organization, one that handle goods with RFID and another that handle goods with the older system; barcodes. The logistics industry is referred to as “very traditional and not very keen on changing” by Company E– (2015). They believe that there are not any companies within the Logistics industry that utilize RFID technology as everyone use barcodes. The barcode system is according to them functioning well, therefore they have not seen the reason to change a well working concept to another one that is not used by any others in the industry. This is also suggested by Company C– (2015) who perceives that RFID technology is very uncommon in the logistics industry in Norway. Even though it, according to Company E– (2015), is a nice idea that one will be able to follow material flows by using RFID, they do not see a reason for replacing their existing system with a new one.

When working internationally there are challenges that one can encounter, Company A+ (2015) presents challenges they come across in Poland and adjacent countries. The interviewee perceives that it is hard to implement the same RFID system that their company is using in Sweden at other foreign locations. The reason for this is that they do not want to challenge the existing relationship by demanding that they should invest in this new technology. Two of the interviewees also express the concern regarding this; it will not be possible to demand from other members in the supply chains to invest in RFID technology (Company A+, 2015 and Company F–, 2015).

The companies interviewed that do not have RFID (Company C–, 2015; Company D–, 2015; Company E–, 2015 and Company F–, 2015) are using bar codes today. Company E– (2015) do not see any major reasons to change to an RFID system as they are able to
deliver as promised and already meet their customers’ demands. This is also supported by Company C– (2015) that states that they are easy to work with and perform well. Moreover, they suggest that there would not be any major difference in their delivery processes if they were to change to RFID, this because their customers already have access to enough information, as the barcodes get scanned at each station. Company E– (2015) expresses that it is key that they deliver as promised to stay competitive and that barcodes makes this possible, as they have a really low amount of delivery errors.

The four companies interviewed that utilize RFID (Company A+, 2015; Company B+, 2015; Company G+, 2015 and Company H+, 2015) do not express any major concerns. However, Company B+ (2015) states that it can be issues when products are being transported. The customers that are using RFID technology and want them to get scanned need to send these products through the company’s facilities. Sometimes this is not possible as the cargo is nowhere near their locations. Thus, makes it hard to provide the service of scanning the customers’ goods. Furthermore, it is suggested by Company H+ (2015) that RFID could become more beneficial if their suppliers implemented RFID as well. Today they are using RFID internally to tag their pallets/boxes and believe that if the supplier marked their goods as well, the material flow would be able to become more time efficient.

4.3.2 Perceived Benefits of Place

All of the companies interviewed have some sort of warehouse where they store and handle goods. RFID technology might, according to Company F– (2015), increase the visibility of products in the warehouse, as one will in a time efficient way be able to perform inventory controls, in comparison to when bar codes are used, as one can scan several products at once. This statement is reinforced by Company G+ (2015) who says that the inventory process is where they have noticed a major change since they implemented a RFID system. After the implementation, inventory is calculated automatically, in real time, which reduce the otherwise time consuming process of manually control the inventory levels, which is also suggested by Company F– (2015). Company F– (2015) also suggest that by the opportunity to keep control over the inventory levels in real time, one will be able to help customers reduce their security stocks, which in turn will lead to a more efficient material flow. Moreover, this allows the customers to always be able to track and monitor their inventory levels through a
computerized program without having to go to the warehouse. Company H+ (2015) also express that it has been a noticeable change in their warehouse after implementing RFID, the work process is now more efficient as it is atomized and there are less manual steps that needs to be performed.

Receiving goods is according to Company E− (2015) and Company F− (2015), the most time consuming process in their warehouses. They both state that if it would be possible to automatically scan goods at arrival it would most likely lead to a more efficient process and reduce the time spent on this process that otherwise would be manually performed. This would make the process faster, which they believe could create a competitive advantage.

RFID technology could, according to Company F− (2015), improve many processes, especially the ones when products are delivered to them and when products are delivered to the customers. Company H+ (2015) state that by RFID they have the possibility to identify all of their goods automatically and by this they can see where the goods should be transported and confirm that the goods are on the right truck, going to the right place. If any goods would be on the wrong truck then an alarm goes off and they can instantly correct the error. This leads to a delivery process with fewer errors which in turn lead to an improvement in delivery performance. Correspondingly, Company G+ (2015) suggests that RFID contributes to reduce the errors made by humans, and that this saves a large amount of time and money as the processes becomes more effective and efficient. Furthermore, Company E− (2015) also believes that RFID could improve the delivery performance and provide evidence of accurate deliveries, which would help them to stay competitive. They state that a firm within the logistics industry needs to be able to meet customer demand and deliver as promised, and will soon be forced to provide proof that they have sent the right amount of goods. They also believe that, by making the delivery process more time efficient they can reduce costs and by this also be able to increase their competitiveness.

When the products are being transported it is a benefit to be able to see where the products are located (Company A+, 2015). Company H+ (2015) state that through the possibility that is given by RFID to track and trace, they would be able to keep their customers updated throughout the entire transportation process, to increase the value of the service for the customer. Company B+ (2010) suggest similarly that goods that; are
in need of temperature control, possess a high value, or medical supplies are important to be able follow. By tracking these, one will be able to see what is happening to the cargo and see so that everything is as it should be. The traceability also provides higher security. Company A+ (2015) express that RFID helps them to monitor their trucks, and if something unusual or unexpected happens then they will be able to see that right away. Additionally, this is a good way of evaluating where materials are getting lost and to see where time is wasted, this increased visibility will provide the opportunity to address these issues. Company A+ (2015) further states that RFID technology also provides for better logistics management as they can relocate their trucks and reorganize so that they can provide help to customers under a limited amount of time. Moreover, this leads to cheaper transportation, fully loaded trucks and more environmentally friendly work process.

Company F– (2015) believes that RFID would enable an increased perceived customer value as the technology will make the company more efficient throughout the supply chain, and be able to keep a high quality on deliveries. This is also suggested by Company E– (2015), they believe that RFID would make the entire logistics process more efficient, and as there would be an RFID tag on each product, one will be able to improve the processes that will become visible through following the product when it goes through the supply chain. Additionally, the main reason to why Company H+ (2015) implemented RFID was to be able to increase the perceived customer value. They state that they are able to guarantee a better delivery, which most likely will increase customer satisfaction and customer value.

4.4 Promotion

The perceptions of benefits and challenges in relation to promotional aspects among the interviewed companies are divided. While the three companies with a well implemented RFID system have a very positive perception of how RFID can be related to promotional aspects (Company A+, 2015; Company G+, 2015; Company H+, 2015), the perception among the remaining companies interviewed are scattered.

This chapter will address the perception of how RFID affects the companies advertising, personal selling and also the affect on the communication between the companies and
their customers. Furthermore we will begin with discussing how the interviewed companies’ perceive their customers’ relationship to RFID.

4.4.1 The Customers’ Perceived View of RFID

Company H+ (2015) explains his experience of customers’ reaction toward RFID as mixed. Most people have heard about RFID, yet there many people that do not quite know what exactly RFID is good for or what functions it has. Some believe that if you have RFID you do not need to have any EDI system or any bar codes, as they believe all information can be stored in the tag, and while this is true to some extent, RFID does not have that possibility yet (Company H+, 2015). Company G+ (2015) says that some customers do not have that much prior knowledge of RFID and its capabilities. Those customers can be slightly hesitant towards it, however, after they explained how the system works, the customers’ perception normally changes. The perception of RFID is very positive among the customers that they have, that now use RFID and has experienced the benefits. Company G+ (2015) continues to explain that smaller companies normally have less experience and knowledge about RFID, while the medium sized companies have more experience and knowledge, and are normally very interested in finding out more about what benefits the system can provide. The medium sized companies are Company G’s+ (2015) main target segment, as larger sized companies normally already have their own solutions. Company A+ (2015) also have an idea of which customers/companies that are the most interested in, and suited for the use of RFID. Their perception is that the RFID system has the biggest interest among customers that are working with a high material flow, as those are according to Company A+ (2015) the ones that can see and understand the added value of RFID and the increase in quality control.

Company D– (2015) however does not think that their customers would care much for the promotion or communication of RFID. Rather they believe that their customers’ will have little interest in how things are done, as long as needs are met. Company E– (2015) shares a similar point of view. They believe that their customers do not have the knowledge to understand what benefits that RFID can provide. They think that their customers would have little interest in the subject, as long they can deliver as promised, the technology they use will make little difference to their customers.
4.4.2 Perceived Challenges of Promotion

Company D– (2015) does not question the value of RFID, although they do not think that RFID can make any noticeable changes to their marketing activities. They believe that in the future RFID will be a part of a bigger system and people will just expect you to have it. By the time it starts to get common they do not think that it will be possible to promote RFID, that doing so would be like trying to promote that you have internet. Also Company B+ (2015) relates RFID to the internet. They say that they have never used RFID as part of their marketing strategy and also have not seen it as a marketing tool. However if RFID would get a major breakthrough, then they will most certainly use RFID in their marketing.

Company C– (2015) would not use RFID in their marketing activities. They say that they focus on selling a solution to their customers, and do not promote what technology they use to accomplish this, as they do not think that the customer would have any interest in the technology they use, including if they were using RFID. They instead fully focus on promoting the solution they can provide.

4.4.3 Perceived Benefits of Promotion

By the atomized system that RFID provides, Company G+ (2015) can get an overview of how all their customers are performing. Thus they can instantly see when customers’ numbers goes up and down and can therefore support their customers better. This helps improve the communication they have with their customers as well as the customer relationship (Company G+, 2015). They explain that currently they mostly promote their RFID system through personal communication through their sales personnel and their marketing department, but are planning to start promoting their RFID system both through brochures and online in the future. They want to communicate to their customers the time and money that can be saved through the use of RFID. They say that fewer errors will lead to less cost which results in happier customers (Company G+, 2015).

Company A+ (2015) also mainly promotes their RFID system through personal communication. During meetings they put forward their use of RFID together with other customers, and when they sense an interest from the customer they take it from there. During sales meeting they have power point presentations to be able to show the
customers how they work with RFID, they also inform the customer about the increased quality in material flows and the possibility to keep close track of the product during transportation (Company A+, 2015). Company F– (2015) has not yet implemented RFID, but talks about the importance of having an open conversation with their customers about RFID, to see if there is any possible interest. They also say that if they would have an RFID system then they would communicate to their customers the benefits that this could provide (Company F–, 2015).

Company H+ (2015) says that they definitely promote their use of RFID in their logistics process. They partly promote their use of RFID through their sales personnel, but also through inviting their key customers and other visitors to their central warehouse, where they show their logistics model which also is one of their key aspects in their sales model. A big part of the presentation that they show their visitors and customers is about their use of RFID and how it allows them to improve their logistics and ensure that they can deliver on time, and their reliable logistics model is a strong sales argument (Company H+, 2015). Company G+ (2015) promotes to their customers how they can handle the entire process for the customer, from the minute the customer’s goods get into their hands to the minute it leaves their hands. This allows their customers to focus on their own core business and leave the logistics part to them.

Whenever Company G+ (2015) sell this service they make sure to put forward the benefits that RFID can offer, which also means that these are benefits that they can deliver. In order for them to ensure to new perspective customers that they can deliver as promised, Company G+ (2015) use their good relationship with their customers as references for their new customers. They say that to be able to offer new customers references is very beneficial, since it will help the customer understand the concept before purchasing it (Company G+, 2015). Also Company A+ (2015) provides references to new potential customers, as they believe that it is crucial to be able to communicate the benefits of the product.

Both Company G+ (2015) and Company H+ (2015) use statistics and/or key number which show the benefits of RFID as an important sales argument. Company H+ (2015) highlight that their industry is always developing, yet they and their competitors offer similar products. Thus it is important to be able to offer their customers added service and value that their competitors cannot provide. By promoting to potential customers
that they use RFID, Company G+ (2015) recently won an account, and says that if they
would not have been able to offer this customer RFID, they would never have signed
that customer. Company F− (2015) also says that if they could promote to their
customers that they are using RFID, and that they think that this could improve their
efficiency and might even allow them to push down the prices; then they believe this
would help them gain a competitive advantage.
5 Analysis

In this chapter the empirical data will be presented in relation to the theories used throughout this study in the aim to gain an understanding of the research purpose. The chapter will include an analysis in the following sections: Product, Price, Place and Promotion.

5.1 Product

The product that logistics companies are offering their customers is according to Lin and Ho (2009) the ability to supply services and products to the customer at the right time, in the right quantity and quality, to an acceptable price. Kotler and Armstrong (2012) suggest that to do so, a logistics company needs to plan and control physical flows of materials, goods and information from the source to the final destination to meet the customer demands with a profit. Additionally, Kotler and Armstrong present the product as the combination of service and products that are offered as a solution to the customer. The value the customer sees in the product is, according to Zineldin and Philipson (2007), affected by how well-established the relationship is between the seller and the customer. The perceived value of the offering will increase when the relationship is strong.

According to Lin (2009), RFID is one of the newest innovative technologies utilized within the logistics industry. Even though this technology has been around for decades (Asif and Mandviwalla, 2005) there are still a lot of uncertainties regarding the RFID solution, the adoption of technology, and the use of it within logistics and supply chain management (Jonsson, 2008; Bunduchi, Weisshaar and Smart, 2011; Cannon et al., 2008). This is reinforced throughout the interviewees; two of the companies that use RFID perceived the technology as uncommon within the logistics industry (Company A+, 2015; Company H+, 2015). This is also stated by three of the companies that do not utilize RFID technology (Company C–, 2015; Company E–, 2015). Moreover, the technology is perceived as too new for many of the companies customers and they do not know what this solution involves (Company A+, 2015; Company G+, 2015). It is also expressed by Company G+ (2015) and Company A+ (2015) that during sales meetings they need to provide the customers with information about RFID and their offered solution in order for them to see the benefits of the technology and make the offer more appealing. It is unusual that customers ask if the companies have the ability
to provide RFID solutions (Company B+, 2015; Company C–, 2015). Additional to this is that it is believed that RFID will get its big breakthrough when larger, market leading companies adopt RFID, as this would force the rest of the industry to start using the technology (Company C–, 2015; Company E–, 2015; Company F–, 2015). Lin and Ho (2015) state that it is important to increase the knowledge about RFID among logistics companies as this might help increase the willingness to adopt the technology within the industry. It is additionally stated by three of the interviewees that the customers need to demand the usage of RFID before they will implement or utilize it (Company B+, 2015; Company C–, 2015; Company E–, 2015).

All members of the supply chain need to adopt RFID technology in order to gain the most benefits out of it (Lin, 2009). This also provides a major concern about that there is no standard solution for RFID technology (Sarac, Absi and Dauzère-Pérès, 2010), which creates the possibility that all the members of the supply chain can adopt different variants of RFID solutions (Lin, 2009). One of the interviewees, Company F– (2015), explicitly express that they have never seen RFID completely implemented, as not all members of the supply chain are using it. It would become more valuable if the RFID technology was implemented in the beginning of the process, in production (Company E–, 2015; Company F–, 2015), as this would increase the efficiency when receiving goods (Company E–, 2015; Company F–, 2015; Company H+, 2015).

Concerns regarding standards are also expressed by two of the interviewees. The lack of a standard solution makes it hard to implement, and they believe that if a standard solution existed, it would become more common within the logistics industry (Company E–, 2015; Company H+, 2015). Moreover, it is stated that it is hard to demand from customers that they should implement RFID technology, as it is a customer driven industry and they are working to please their demands (Company A+, 2015; Company F–, 2015). Furthermore, there is one of the interviewees, Company A+ (2015), that are in contact with several different variants of RFID technology. They state that if the customer would demand for them to scan their products and they do not have the suitable technology they would invest in this and according to them “scanning is a service that a logistics company should be able to provide its customers with” (Company A+, 2015). This is aligned with Lin’s (2009) research, where it is stated that the lack of standards increases the challenges when trying to meet all customers’
different needs. This is also reinforced by Sarac, Absi and Dauzère-Pérès (2010) and Lin and Ho (2009) which suggests that the lack of standards has affected the companies’ willingness to adopt RFID technology.

RFID technology provides an increased visibility (Bunduchi, Weisshaar and Smart, 2011), increase in information sharing (Asif and Mandviwalla, 2005) and increased efficiency and effectiveness throughout the logistics and supply chain processes (Bunduchi, Weisshaar and Smart, 2011; Tzeng et al., 2008). These statements are all reinforced by the all of the eight interviews conducted in various ways. They all believe that the processes in some sense will be more efficient and effective, as the visibility increases with the ability to track products. Two of the interviewees, which do not work with RFID technology, believe that it can facilitate an increased competitiveness and increase the perceived customer value (Company E−, 2015; Company F−, 2015). This is also reinforced by two of the interviewees that are working with RFID, that state that this is the case (Company G+, 2015; Company H+, 2015) and Company G+ (2015) states that their customer relationship has become stronger since they implemented RFID into their logistics process, which has lead to an increase in perceived customer value. It has also it has been suggested that the improved information flow and visibility will create opportunities to improve logistics processes (Company A+, 2015; Company D−, 2015; Company F−, 2015). Even though Company E− (2015) and Company F− (2015) see benefits of RFID, they do not see a major reason to change from their existing system, barcodes. Main explanations for this are that there are still too many insecurities and a lack of standardization in the RFID technology.

5.2 Price

Zineldin and Philipson (2007) states that when addressing the concept of price in marketing, it is important to see every relationship as an investment for the company and when these relationships are handled well it will increase the chances of customer loyalty. Further, price is explained by Kotler and Armstrong (2012) and Goi (2009) as the overall cost the customer pays to gain the solution.

According to Lin (2009) one of the main obstacles and challenges of RFID is the high cost. This is also an aspect that is recurring throughout the interviews conducted and appears to be one of the main challenges of RFID within the logistics industry in
Scandinavia. All companies that were interviewed expressed in one way or another that RFID would be more beneficial and common in the logistics industry if the cost of the technology was either cheaper or could be shared with other parties in the supply chain (Company A – H, 2015). However, Company F– (2015) also expressed that they do not believe that it is the cost of RFID that is the major problem anymore, but rather the lack of standards and the advanced technology that is now the main issue. This is reinforced by Company H+ (2015) expressing that they believe that the industry is waiting for a better standard within RFID technology and only after this will RFID become profitable for more companies in the industry. This is also aligned with the research of Lin (2009), which states that the firms within the logistics industry are waiting for a more standardized RFID technology, which can lower the cost of the technology.

Attaran (2012) suggests that RFID can help decrease cost, improve services and efficiency, and increase the ROI within supply chains. It is suggested that RFID can help with all these aspects (Attaran, 2012) and further decrease the total supply chain cost by increasing the company’s overall performance (Sabbaghi and Vaidyanathan, 2008; Sari, 2010; Ustundag and Tanyas, 2009). Overall, five out of eight interviewed companies believed that RFID has, or would have a positive influence on their logistics processes in relation to price as mentioned in the theories (Company A+, 2015; Company E–, 2015; Company F–, 2015; Company G–, 2015; Company H+, 2015). However the three remaining companies had different perceptions of what influence RFID would have on price in their companies.

The three out of four companies that had implemented RFID perceived that it had improved their process in several ways. By keeping track of high value goods and/or enabling a more effective and efficient process, their RFID system resulted in monetary benefits (Company A+, 2015; Company G+, 2015; Company H+, 2015). Company H+ (2015) gave the example of automatically detecting errors in the warehouse, and saving both time and money, as one minor error in the warehouse could affect as many as 60 customers later in the process.

Two out of four companies that did not have an implemented RFID system said that they believed that RFID would provide benefits in their logistics process, and thought that it would help their process become more profitable (Company E–, 2015; Company F–, 2015).
There was one company that had implemented RFID, but was not using it currently unless their customers required it, that did not perceive RFID to be profitable in their logistics process. Their perception was that RFID was not profitable when working with lower value goods. They expressed that in that part of their company, in that country, they worked with goods such as car tires, and did not feel the need to be able to track these products, as the value of the products were too low and the market too price sensitive. However, in another part of their organization, in another country, they were transporting expensive art, and that this was an area of which their company used RFID to track the products (Company B+, 2015).

The two companies that did not have RFID, and did not perceive that RFID would increase their profits in their logistics system were Company C– (2015) and Company D– (2015). Company C– (2015) believed that RFID was too expensive for them to implement as they did not see it being profitable to implement RFID on low value goods, similar to Company B+ (2015). However, Company C– (2015) also stated that if one of their major customers would require them to use a RFID system then they would implement it as well as be willing to pay for it. Company D– (2015) did not believe that RFID was anything that they could make money from. They did not believe that RFID would be profitable for their company as they perceived that their customers did not have material flows that were large enough.

These findings, regarding perception of price seems to be independent of whether or not these companies had implemented RFID or not. It can be related to one aspect, of which the theories in this paper do not discuss, yet was shown to be a recurring subject in several of the interviews. It is the fact that the ROI from RFID is perceived to be dependent on the value and volume of material flow (Company C–, 2015; Company D–, 2015; Company H+, 2015). In other words the profit must exceed the breakeven cost either by working with high value goods, or having volumes large enough for the logistics process to gain from the effectiveness and efficiency provided by an RFID system. The breakeven cost can be related to the six costs of RFID defined by Lin (2009) as the; system establishment costs, maintenance costs, integration costs, customization costs, training costs, and operation costs. Further, Lin (2009) also states the importance of performing a cost-benefit evaluation to increase the understanding of how RFID should be utilized to be beneficial, which indicates that RFID is not suited
for all situations and all logistics processes. This is also put forward by Company H+ (2015) that says that companies need to have, or find, a situation where a RFID solution is beneficial enough for it to be profitable in order to implement RFID technology.

5.3 Place

The place comprises locations, logistics and other activities performed in order to make the product service accessible for the customer, i.e. how convenient the product or service is to get a hold of. Place also covers aspects such as; locations, warehouses, inventory, and logistics (Kotler and Armstrong, 2012), and it is suggested by Zineldin and Philipson (2007) that the place is a really important aspect, as it has to generate superior value for the customer.

In the recent years, RFID has enabled logistics warehouses to become more computerized and automated (Kotler and Armstrong, 2012) which is suggested to lead to a more efficient and effective logistics process (Jonsson, 2008; Bunduchi, Weisshaar and Smart, 2011). This concurs with several of the interviewees who also express that RFID increases visibility in the supply chain, provides better quality controls, enhance the possibility to keep customers well-informed (Company A+, 2015; Company F–, 2015; Company G+, 2015; Company H+, 2015).

Company B+ (2015), Company C– (2015) and Company E– (2015) does not think RFID will increase their delivery performance as they believe they have a great delivery performance already with their existing barcode system. And although they do not express that their current barcode system is better than an RFID system, which would be deviant from the theories in this paper, they also do not see any reason to change systems.

However, although Company E– (2015) believes that RFID will not increase their delivery performance they also stated; “RFID takes this process to another level as one can scan the wrong barcode, but with RFID one can see the exact information of the delivery right away.” This indicates that Company E– (2015) still have a positive perception of RFID’s influence on place however, they cannot see the positive influence within their own logistics process. One possible explanation to this is that Company E– does not have customers with material flows large enough for RFID to be a beneficial solution for them.
Two of the largest companies that were interviewed; Company B+ (2015) and Company C–, (2015) do not believe that there would be any difference in the amount of information available if they should work with RFID, and that barcodes provide all the information needed for them and their customers. Company C– (2015) says that there would not be any major difference in their delivery processes if they were to implement RFID. However as stated by Company G+ (2015), larger sized companies normally already have their own solutions, and thus it is not as common in these larger companies to have implemented RFID in just one of their logistics process unless the entire enterprise implements it. This means that Company B+ and Company C– most likely already have a standard solution within their enterprises that they use worldwide, hence if they were to implement RFID they would not be consistent with the rest of their supply chain.

As stated, RFID enables a more efficient and effective logistics process (Jonsson, 2008; Bunduchi, Weisshaar and Smart, 2011) and one reason is that the atomization and reduced manual handling (Kotler and Armstrong, 2012) as in comparison to more standardized systems like barcodes. There are scattered perceptions of RFID influence on place among the companies interviewed, and the findings indicate that the perception is dependent upon the size of the implementing company. However by the companies that had successfully implemented RFID, Company A+ (2015), Company G+ (2015), Company H+ (2015) had a very positive perception of RFID’s influence on Place, and highlighted benefits such as; a more efficient logistics process and an increased delivery performance.

5.4 Promotion

Kotler and Armstrong (2012) define promotion as how a solution is communicated to the customer in order to sell a product or service. According to Kärkkäinen (2003), Tajima, (2007) and Tzeng et al. (2008), RFID tags can improve information sharing within the logistics process and hence facilitate a more effective communication between parties.

The overall perception of RFID’s influence on promotional aspects differed among all the companies. Companies that had not implemented RFID had a different perception of how RFID would be used to influence promotion and marketing in their company. The
companies that had implemented RFID were able to use it as a tool to promote their improved logistics process, supported by key numbers, statistics and positive references (Company A+, 2015; Company G+, 2015; Company H+, 2015). Key numbers and statistics can be drawn from a RFID system as it provides real-time and more accurate information (Attaran, 2012; O’Callaghan, Kaufmann and Konsynski, 1992; Sarac, Absi, and Dauzère-Pérès, 2010; Tajima, 2007).

The companies that did not have RFID (Company C–, 2015; Company D–, 2015; Company E–, 2015; Company F–, 2015), when asked the question if they believed that RFID influenced or could be used in their marketing and communication to their customers, looked at RFID as a product to be communicated and marketed, rather than a tool that could be used to improve their overall communication and marketing of their service to improve the perceived customer value.

Furthermore, out of the eight companies that were interviewed, four companies perceived that RFID would have a positive influence on their promotion and marketing (Company A+, 2015; Company F–, 2015; Company G+, 2015; Company H+, 2015). The remaining four companies had different perceptions of how RFID would influence their marketing and promotion.

As mentioned, Company B+ (2015) had implemented RFID before, but was not currently using it as they did not perceive it to be profitable enough as a result of dealing with low value goods. They stated that they did not use RFID as a marketing tool but acknowledged that if RFID would have a breakthrough, they most definitely would start using RFID in their marketing.

Company D– (2015) did not think that it would be possible to promote RFID as they believed that RFID would be part of a bigger system. Both Company B+ (2015) and Company D– (2015) believed that promoting RFID would be akin to promoting the internet.

Company C– (2015) had a positive perception of RFID’s possible influence on their processes. However, they did not believe in promoting the technology, but rather focusing on selling a solution to their customers. Also Company E– (2015) had a similar perception of RFID, where they believed that their customers would have little interest in what technology they use. This can be related to the above, where RFID fails to be
perceived as a tool to improve communication and marketing and is rather a product to be marketed.

Regardless of the companies’ perceptions of RFID, it was only the companies which had successfully implemented RFID (Company A+, 2015; Company G+, 2015; Company H+, 2015) that were able to see RFID as both a product that could be marketed to their customers and a tool which provides useful information to improve their marketing and communication to their customers. These were the companies which saw potential promotional benefits of RFID. According to Company G+ (2015), they perceive that their smaller customers and customers with smaller material flow to have less experience and knowledge about RFID and were therefore more hesitant towards the use of RFID. This might be able to be related back to Company B+ (2015) and Company D- (2015) and their perception of RFID’s influence on promotion and marketing. Ultimately, it can be related back to Rundh (2008, p.111) who states “RFID can be a useful tool in organizations that understand the capabilities and limitations of the technology”.
6 Conclusion and Implications

In this chapter the authors of this paper will discuss and present their conclusions regarding their findings of what perceived influence does RFID have on the four P’s, in a B2B context, in logistic providing firms within Scandinavia. This chapter contains; the Conclusions of the study, Theoretical and Managerial Implications, Future Research, the Research Limitations and finally the Concluding Remarks.

6.1 RFID’s perceived influence on Product

In accordance with the theories, there is a lot of uncertainty towards RFID within the logistics industry, both among the companies and their customers. The main reasons for this insecurity seems to be that the technology is unusual to get in contact with, also referred to as too new. Moreover, the knowledge about RFID technology among the logistics companies’ and their customers is perceived as low. Today, sales personnel have to provide the customers with the knowledge needed in order to understand the potential benefits of RFID in order for them to see the superior value of their offer. It is also stated that three of the logistics companies interviewed will not implement or use RFID solutions if not the customer ask for it specifically, as they believe their barcode system provides for an almost as good solution for the customer. Therefore, it might be crucial to provide both logistics companies and their customers with knowledge about the RFID solution as well, which is not discussed in the theories provided. If this was done, the customers will gain the knowledge needed to be able to recognize the benefits of the solution and through this also demand this service from the logistics companies. Furthermore, this increased knowledge among companies and the customers may increase RFID’s positive influence on the product.

Moreover, the fact that if there is no standard solution of RFID technology is also a major concern among the logistics companies. It has been suggested of several logistics firms that they would have implemented a RFID solution, if there was a standard solution available. For the technology to become the most beneficial it has been suggested that it needs to be implemented by the entire supply chain, and with a standard solution it may increase the possibility that the customers will have the same solution as the logistics firm, which would increase the perceived value of RFID for all
parties involved as it facilitates for a more efficient and effective supply chain and logistics process.

Nevertheless, all of the logistics companies interviewed believe the RFID technology can provide increase competitiveness and increase the perceived customer value. It has also been stated that RFID will increase the possibility of making the logistics processes and the supply chain more efficient.

Based on this, one can draw the conclusion that RFID’s influence on the logistics industry’s offered product is positive, as the logistics solution offered to its customers is improved by the use of RFID technology. Nonetheless, it is believed that one can increase the positive influence on the offer by providing more knowledge about RFID and the utilization of this technology, among the logistics companies and their customers. This will lead to increase the perceived customer value of the logistics companies’ product and service. Furthermore, it is suggested that a standardized solution would make the perceived influence of RFID on the product even more favorable, as it would increase the value creation throughout the entire supply chain and therefore also increase RFID’s perceived influence on the product.

6.2 RFID’s perceived influence on Price

The empirical findings of this paper suggests that RFID’s perceived influence on price is dependent on the two criteria that was established in the analysis chapter; volume of material flow and value of material flow. For RFID to have a positive influence on the price, the logistics process must meet and exceed the economy of scale by fulfilling one or both of the given criteria.

Thus it is crucial for any company that is considering implementing a RFID system into their logistics process to understand the limitations of the technology, and to assess if their logistics process fulfills the economies of scale that is required.

The authors of this paper can conclude that if successfully implemented and conforming to nominal material volumes and/or values, then RFID has a positive perceived influence on the price in the marketing mix, in a B2B context, in logistic providing firms within Scandinavia. It allows the implementing company to improve their internal processes and product in a way which has a positive influence on the ROI in the supply
chain. This also allows the implementing company to offer a competitive product/service, yet maintain a competitive price, hence improving the competitive advantage of the implementing company. This conclusion was reaffirmed by the three companies that successfully had implemented RFID into their logistics process.

6.3 RFID’s perceived influence on Place

The utilization of RFID among logistics companies is perceived to lead to a more efficient and effective material handling throughout the supply chain, as the technology provides for an increased visibility and information needed to improve their logistics processes and warehouse management. Moreover, four of the interviewees also suggest that RFID technology provides for an improved delivery performance as one is given the possibility to always keep track of goods. However, the interviewees do not believe RFID technology can provide this, as their delivery performance is good enough to satisfy customers’ needs in delivery performance. This may be the results from that these companies has a high delivery performance already, and therefore do not see a need for improved delivery performance to increase customer satisfaction.

The most noticeable factors that get affected by the use of RFID technology are the warehouse- and inventory-management, and the material-flow. RFID allows for customers to keep control on their inventory levels in real time, without being at place which results in an increase in perceived customer value. Furthermore, RFID technology provides the company with an optimized material- and work-flow throughout the warehouses, which enhance the possibilities to satisfy customer demands.

From this, the conclusions can be drawn that the perceived influence RFID-technology has on place is positive. In the aspect of warehousing and inventory management, the perceived influence is positive as it enhances the logistics companies’ abilities to provide superior value to their customers. However, in relation to delivery performance, there are incoherent results. This is also the case with the aspect concerning information. One can draw the conclusion that these incoherencies seem to be the effect of the perception that these logistics companies already provides good delivery performance or that they do not have a large enough material flow to perceive the benefits of RFID.
6.4 RFID’s perceived influence on Promotion

The empirical findings suggest that RFID’s perceived influence on promotion is dependent upon the company’s knowledge and education about RFID’s capabilities and potential. Regardless of the companies’ perception of RFID, it was only the companies which had a successfully implemented a RFID system that could see RFID’s full potential within promotion.

The companies without a successfully implemented RFID system were more limited in their knowledge about RFID as well as limited experience. RFID was either seen as not having any positive influence in promotional aspects, or, the companies were limited in grasping RFID’s full potential and could therefore only see certain aspects of the possible benefits. This indicates that the lack of knowledge about RFID in the logistics industry limits the perceptions of RFID’s potential within promotional aspects.

However, the companies with a successfully implemented RFID system had more knowledge about the possibilities and could therefore better identify the potential of the technology. These companies were able to see RFID as both a product that could be marketed to their customers as well as a tool which can provide useful information, such as key numbers and statistics, to improve their marketing and communication. Thus these companies perceived RFID to have a positive influence on their promotion.

Hence, the authors of this paper can therefore conclude that a successfully implemented RFID has a positive perceived influence on promotion, in a B2B context, in the logistics industry in Scandinavia. RFID has a great influence on the promotional aspect as it enables both more and improved information sharing between parties, leading to an increased competitive advantage in the targeted market.

6.5 Theoretical Implications

This study has addressed RFID’s perceived influence on the four P’s in the marketing mix, an area that is to, the authors’ knowledge, previously unexplored. The authors’ applied existing research regarding RFID’s benefits, challenges and influence in the logistics industry and supply chain, and through in-depth interviews, sought to understand if RFID has similar influences as well as any other additional impacts on marketing.
The results have shown that RFID has a positive influence on the four P’s and correlates with the theories that this study was built upon. The empirical findings of this paper suggest that, if successfully implemented, RFID creates closer relationships between companies that are utilizing RFID, helps increase customer value and also increases a logistics company’s competitive advantage.

Theory suggests that one of the major challenges of RFID is the cost of the technology and this is supported by the findings of this study. However, this study suggests that the successful implementation of RFID within the logistics industry is dependent upon the value of the material and volume of material flow. That is, that the implementing company must exceed a certain economy of scale for RFID to be financially beneficial and exceed the cost of implementation and cost of the RFID tags.

6.6 Managerial Implications

As previously mentioned, when successfully implemented, RFID can have a positive influence on a company’s product, price, place and promotion, as well as strengthening a company’s competitive advantage. Therefore the authors of this paper suggest that when managers are considering implementing RFID there are certain aspects they need to address.

The first aspect is economy of scale. Managers must analyze the cost of implementation and cost of RFID tags in relation to their value of material and volume of material flow in order to see if the implementation would be financially beneficial. If the company does not fulfill these criteria, then it is not likely that RFID will have a positive influence on Price.

Secondly, the managers must address the standards of RFID that are available. They need to see if there are any other members of their supply chain that are using RFID, and in that case which standards they apply. If RFID can be used by several members in the supply chain then it can be highly beneficial. However if the same standards are not implemented, then it will be the same as using two parallel systems, and several of the benefits that can be gained from the use of RFID would be lost.

Thirdly, there is a lack of knowledge about RFID, and therefore the authors suggest that managers must seek to gain more knowledge about the technology, its opportunities and
limitations before implementing it. One way for managers to gain knowledge about how the technology works can be to address similar players in the market that are using RFID, and see what influences it has on their organizations. Furthermore, for RFID to be as beneficial as possible, managers should make an effort to educate their personnel about the technology and its capabilities, and only then will RFID reach a higher potential.

6.7 Research Limitation

This section will discuss the most noticeable and important limitations of this study.

One limitation of the study was interview restrictions. Three out of eight interviews had to be conducted over the telephone due to geographical restrictions. The three companies were located either in another country, or at such a distance that it was not possible to conduct face-to-face interviews. This might have restricted the data collected as closer interaction and observation with the interviewees were not possible.

Furthermore, the sample group was restricted to eight interviews due to the limitation of time. This may have somewhat limited the data collected in the study, and if additional time were available to conduct more interviews, deeper insights may have been gained into the subject matter.

6.8 Future Research

The theories in this study together with the empirical findings have identified cost to be one of the biggest challenges with RFID technology. The findings of this study conclude that for RFID to be profitable in the logistics industry in Scandinavia, it must reach a certain economy of scale, either through volume of material flow or value of material flow. Thus, the authors would recommend further research into the economic aspects of RFID, with a view to determining critical material volumes and values that may make RFID more attractive for prospective companies. Such research could aid prospective companies considering implementing RFID into their logistics processes in determining if such a system would be profitable for their supply chain. This may, in turn, lead to an increased presence of RFID in the logistics industry, which may simultaneously contribute towards a greater standardization of RFID technology.
The authors would also recommend further research into the aspect of knowledge, as it has been seen through this study that RFID solutions are suggested to become more popular if the knowledge about the technology increases. Thus, this aspect is of interest to investigate further. This can, for example, be done through conducting a study of the relationship between increased knowledge and perceived risk in relation to RFID technology and the logistics industry. It has been proposed by several companies that RFID, if it becomes more well-known, probably will get a widespread acceptance among logistics companies and their customers. Hence, it is suggested that the risk of investment will decrease when the knowledge increase.

The authors of this paper also recommend that similar research to this one can be performed in other countries and geographical areas as this research were restricted to Scandinavia. This would lead to an increased understanding of the problem addressed and provide additional information about the subject; the perceived influence RFID’s has on logistics companies marketing mix.

Lastly, the authors would like to recommend for further research of the subject addressed in this paper, but performed with a quantitative approach. By performing a quantitative study, it will become possible to quantifying a larger amount of data and to present findings from a larger sample group. This would provide a statistical analysis and a statistical result of the subject that can prove or disprove the results of this study. This will most likely increase the understanding of the subject and furthermore provide more evidential material with clear and defined facts from a larger sample.

6.9 Concluding Remarks

In today’s logistics industry, efficiency and effectiveness is vital to stay competitive. It is clear that a logistics company that wants to provide the customer with a superior value proposition need to be able to deliver the right products, at the right time, in the right quantity under highly organized conditions. It is evident that RFID systems can enable logistics companies to increase the quality and the perceived value of their customer solutions. This also implies that a company, by the use of RFID systems, can improve their marketing mix; product, price, place and promotion. Nonetheless, the lack of knowledge regarding RFID systems, the fact that there are no standardized solution and the perception of cost, are the main noticeable variables decelerating the progress of
a big breakthrough for RFID technology. The authors of this paper are confident that RFID solutions will become widely spread when these obstacles are truly mastered and the technology is extensively recognized.
References


NE, 2015. *Nationalencyklopedin (NE)*. [online] Available at: <http://www.ne.se/s%C3%B6k/?t=uppslagsverk&q=RFID> [Accessed 27 may 2015].


"Company A+", 2015. Interview number 1 [interview](Personal communication, 10 April 2015).

"Company B+", 2015. Interview number 2 [interview](Personal communication, 14 April 2015).

"Company C-", 2015. Interview number 3 [interview](Personal communication, 16 April 2015).

"Company D-", 2015. Interview number 4 [interview](Personal communication, 17 April 2015).

"Company E-", 2015. Interview number 5 [interview](Personal communication, 21 April 2015).

"Company F-", 2015. Interview number 6 [interview](Personal communication, 21 April 2015).

"Company G+", 2015. Interview number 7 [interview](Personal communication, 23 April 2015).

Appendices
Appendix 1, Transcript email

Hi name,

My name is Sophie Dyvelås, and at this moment my colleagues, Caroline and Frida, and I are writing our bachelor thesis, about; RFID and its perceived impact on marketing within Logistics companies using RFID within Scandinavia. We feel that this is an important subject to study sense the research done in the area is next to nothing, compared with research only done on RFID technology itself. Also, as sales and marketing students, it is interesting to see if RFID has a negative or positive influence on marketing strategies.

We now hope that you have the time and interest of participating in an interview at any time between the 7th of April- 30th of April. We are very flexible with time and dates and can even do it over Skype if that would suite you better. The interview will be around 30 min up to one hour.

You can contact us on this email or phone: +46762638973

Best regards,

Sophie Dyvelås, Frida Andersson and Caroline Hansson

International Sales and Marketing

Linnaeus University, Sweden
Hi name,

We contacted you some time back regarding our bachelor thesis; **RFID and its perceived impact on marketing within Logistics companies using RFID within Scandinavia.** We are still hopeful that you have the time and interests of participate in an interview at any time between the 9th and the 30th of April.

Best regards,

Sophie Dyvelås, Frida Andersson and Caroline Hansson

International Sales and Marketing

Linnaeus University, Sweden
Appendix 3, Interview Guide

For companies with an implemented RFID system

1. Can you describe how your company uses RFID today?
2. For what reasons did you implement RFID technology within your company?
3. In what way and in which processes does RFID technology contribute to your company?
   a. What influence do you think that RFID has on your logistics process?
   b. What influence do you think that RFID has on your warehouse management?
4. Have your company developed after you started to use RFID technology? If so, in what ways?
   a. What influence do you think that RFID has on financial aspects in your company?
5. What are the advantages with using RFID technology?
6. What are the disadvantages with using RFID technology?
7. What are the most noticeable changes in your company’s marketing activities since you came to implement RFID technology?
8. Has RFID technology resulted in other noticeable changes in your company and its processes?
9. Does your company utilize the usage of RFID technology in its marketing strategies?
10. Does RFID technology provide valuable information that can be used within marketing activities?
11. Does your company promote to its customers that you are using RFID? If so, in what ways?
12. How do your customers react towards that you are using RFID technology?
13. Have RFID technology contributed to an increase in perceived customer value? If so, in what ways?
14. Have RFID technology in any way influenced your competitiveness?
15. Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?
For companies without an implemented RFID system

1. Can you describe how your company uses RFID today?

2. For what reasons have you not implemented RFID technology within your company?

3. In what ways and in which processes do you think RFID technology could contribute to your company?
   
   a. What influence do you think that RFID would have on your logistics process?
   
   b. What influence do you think that RFID would have on your warehouse management?

4. If you started to use RFID, how do you think RFID would develop your company? If so, in what ways?
   
   a. What influence do you think that RFID would have on financial aspects in your company?

5. What do you believe are the advantages with using RFID technology?

6. What do you believe are the disadvantages with using RFID technology?

7. If you were to implement RFID technology into your company, do you believe there would be any other noticeable changes?

8. If you were to implement RFID technology into your company, what do you believe would be the most noticeable changes in your company's marketing activities?

9. Do you believe that your company would utilize the usage of RFID technology in its marketing strategies?

10. Do you believe that RFID technology could provide valuable information that can be used within marketing activities?
11. Would you promote to your customers that you are using RFID if you did? If so, in what ways?

12. How do you think your customers would react if you were to implement RFID technology?

13. Do you believe that RFID technology would contribute to an increase in customer value? If so, in what ways?

14. Do you believe that RFID technology in any way would influence your competitiveness?

15. Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?
Swedish interview guide. For companies with an implemented RFID system

1. Kan ni beskriva hur ert företag använder er av RFID idag?
2. Av vilka anledningar har ni implementerat RFID teknologi i ert företag?
3. Vad anser ni att RFID teknologi tillför till ert företag och i företagets processer?
   a. Vad tror ni att RFID har för påverkan på er logistik process?
   b. Vad tror ni att RFID har för påverkan på ert lager system?
4. Har ert företag utvecklats efter ni börjat använda RFID teknologi? På vilket sätt?
   a. Hur tror ni att RFID påverkar eran ekonomiska situation inom företaget?
5. Vad är fördelarna med att använda RFID teknologi?
6. Vad är nackdelarna med att använda RFID teknologi?
7. Vad är de mest synliga förändringarna inom ert företags marknadsföring efter det att ni kom att använda RFID teknologi?
8. Har RFID resulterat i några andra synliga försändningar i ert företag och era företags processer?
9. Använder ert företag sig av RFID teknologi i era marknadsförings strategier?
10. Bidrar RFID med värdefull information som ni kan använda er utav i er marknadsföring?
11. Marknadsför ert företag att ni använder er av RFID? På vilket sätt?
12. Hur reagerar era kunder på att ni använder er utav RFID teknologi?
13. Har RFID teknologi tillfört ökat värde för kunden? På vilket sätt?
14. Har användningen av RFID teknologi på något sätt påverkat ert företags konkurrenskraft?
15. Finns det något som ni vill tillägga om RFID som inte redan har dikuterats på denna intervju?
Swedish interview guide for companies without an implemented RFID system

1. Kan ni beskriva hur ert företag använder er av RFID idag?
2. Av vilka anledningar har ni inte implementerat RFID teknologi i ert företag?
3. Anser ni att RFID teknologi skulle kunna tillföra något till ert företag?
   a. Vad tror ni att RFID skulle kunna ha för påverkan på er logistik process?
   b. Vad tror ni att RFID skulle kunna ha för påverkan på ert lager system?
4. Hur tror ni ert företag skulle utvecklats om ni börjat använda RFID teknologi?
   a. Hur tror ni att RFID skulle påverka eran ekonomiska situation inom företaget?
5. Vad är fördelarna tror du att det finns med att använda RFID teknologi?
6. Vad är nackdelarna tror du att det finns med att använda RFID teknologi?
7. Tror ni RFID sulle resultera i några synliga försändningar i ert företag och era företags processer?
8. Vad tror ni skulle vara dom mest synliga förändringarna inom ert företags marknadsföring om ni skulle implementera RFID teknologi?
9. Om ni implementerade RFID, skulle ert företag då använda sig utav RFID teknologi i era marknadsförings strategier?
10. Tror ni att RFID skulle kunna bidra med värdefull information som ni skulle kunna använda er utav i er marknadsföring?
11. Skulle ert företag marknadsföra att ni om ni använder er av RFID? I så fall på vilket sätt?
12. Hur tror ni att era kunder skulle reagera på om ni använ des utav RFID teknologi?
13. Tror ni att RFID teknologi kan tillföra ökat värde för kunden? På vilket sätt?
14. Tror ni att användningen av RFID teknologi skulle på något sätt kunna påverkat ert företags konkurrenskraft?
15. Finns det något som ni vill tillägga om RFID som inte redan har dikuterats på denna intervju?
1. **Interviewer:** Can you describe how your company uses RFID today?

**Interviewee:** We have a partnership with a customer where we are tagging pallets. A rack is the thing you put goods on when they are transported. These racks are circulating around in when we drive around and either pick up or deliver goods, for or to various customers. Many of our customers work with LEAN production and they want structure and the ability to keep control and order. When the rack goes into the production area, the right volume of products get loaded on the rack, and by the RFID tag one can see what the rack should get loaded with, and we can also see what rack it is etc.

2. **Interviewer:** For what reasons did you implement RFID technology within your company?

**Interviewee:** So that we could keep track of the racks. If a couple of racks disappear, they will have an identity and a geographical location. Because sometimes the racks disappear by accident, because they have been put away, used for another purpose or they have been stolen etc. Furthermore, you are able to get a status of the racks, they can break and by knowing where they are we will be able to organize for the rack to get fixed. However, we don’t want to rush into working with RFID, we have one customer now that we will try it with and then we will see what happens.

3. **Interviewer:** In what ways and in which processes does RFID technology contribute to your company?

**Interviewee:** The thing is we work a lot together with personnel within border control and the police due to many break-ins, stealing, as well as damage. We are working with safety in our warehouses and try to keep focus on this, and perform all sorts of controls to get better. We are working with companies that handle expensive materials and that share sensitive materials and information with us, and it is important to uphold a high quality.
However, there is a lot of internal stuff happening, unfortunately. There is a big dark number, where products are getting lost. RFID helps here, as we can trace the trucks. So we can see if a truck drives into a parking lot and stays there for 30 minutes. This decreases both loss of goods and increases the ability to become more effective as one can see where time is getting wasted. We have a guy that sees all the trucks all around Europe on his computer. He will see if a truck stops at an inappropriate location and see if there is something unusual happening. In the begging, there were some discussions with the drivers and they were not really happy about it since we would be able to see if they had a hotdog for 15 minutes longer than they should. We had to make it clear that this was not the reason to why we implemented RFID. However, we could still use it like that if someone is not doing his hers job.

a. What influence do you think that RFID has on your logistics process?

Interviewee: As mentioned before we have a project with one of our customers, where a couple of 100 racks are circulating around, even outside of Sweden down to Poland and nearby countries, RFID makes it possible to keep track of the different racks and make sure they get back to Sweden again. RFID has also helped us improve the synergy affect within our logistics process. We are able to react to customers’ requests right away, since we are able to track our trucks and therefore see if they can do an extra stop as well as if the trucks have any space left in the truck. This have also improved the quality of our logistics process, as well as getting things control and in order which is positive for our customers that work in LEAN.

b. What influence do you think that RFID has on your warehouse management?

Interviewee: As mentioned before, we are able to increase security within our warehouse, which is important to us as well as for our customers.
4. **Interviewer:** Have your company developed after you started to use RFID technology? If so, in what ways?

**Interviewee:** We are more effective. Before, when racks disappeared we were not able to track them down, we had to ask around among our customers if they had any lying around, but now we can see where most of them are right away.

As mentioned before, when a customer calls and asks; “*we are in Moheda right now. Can you drive here, can you rearrange? Do you have any space left in any truck?*” This leads to a synergy affect and improved quality. As we can locate our trucks we can rearrange so that we are on spot fast, optimize by fully loaded trucks, which leads to cheaper transport and a more environmentally friendly work process.

    a. *What influence do you think that RFID has on financial aspects in your company?*

**Interviewee:** We buy diesel for millions of crowns every year, which is a huge cost. We try to decrease that with 10%, and if that would be possible it would be great. We have some competitions about driving environmentally friendly were the drivers can get bonuses and stuff like that. This makes us save a lot of money. But the customers have more demands about how environmental friendliness we should be, but they are not really willing to pay for it. Also as I said before that we could keep track of where the racks are, this is an economical advantage that RFID has contributed to. Furthermore, a problem with the RFID cost is that, when we drive to Poland and around there, they do not have the money to invest in RFID and therefore we can take full advantage of RFID.

5. **Interviewer:** What are the advantages with using RFID technology?

**Interviewee:** keeping track of the racks. Our customers do not understand how many racks that get lost and how much that cost every year. Not only the cost of the rack but the amount of work it takes to locate the racks, making phone calls to find missing racks etc. This is where we see an advantaged and also the quality of the flows and getting things in order. You are able to find out in no time where the racks are if a company calls and asks for them, which is a benefit the customers want. Everything is moving quickly these days. We have become a society where everyone wants answer right after they ask a question and it would have been preferable if everything happened an hour or
two hours ago. It is also an economical advantage. Earlier it was hard to see the reason to why racks disappeared, but with the use of RFID we can see when they disappear and also why. One can see what really happened, and do something about it. We will get the information we need to be able to work with situations like these so that they won’t happen again.

6. **Interviewer. What are the disadvantages with using RFID technology?**

**Interviewee:** A lot of people see a problem with more work and high cost, especially the companies that we are working with in Poland. Our problem is that we have issues with the racks in Poland and countries in that area. Some of the racks that goes to the suppliers and customers, we don’t get back in a good quality or not at all. Furthermore, they don’t have the same scanning equipment. This is a bit negative at this point in time. For us this is really negative, both that they don’t have the technological possibilities and that they are not at the same level as us when it comes to quality control. They probably will be at the same level as us in a short period of time, but they work in a different way and they have a different mentality.

It is hard for us to travel to Poland and demand that they should use the same technology as we do and demand that they should invest, it would damage our relationships with them. It is really important to have clear communication and take everything in a slow paste.

It is also hard to reach all the racks, they are lying around on several different locations, and the truck drivers are often given time to be able to tag racks if they get the chance.

Moreover it is as it always is with technology, there can be bad connection and the scanner might be low on battery, all of this of course affects the function of RFID. We have to be prepared if something happens or anything breaks down, we need to be able to take care of the situation.

7. **Interviewer: What are the most noticeable changes in your company’s marketing activities since you came to implement RFID technology?**

**Interviewee:** Not that many, as we only use RFID with one customer and it is quite new. However, we send out catalogs and monthly up-dates where we have created a reference to the customer we are working with RFID with. We will market the use of
RFID in the future, and right now a coworker is developing new brochures’ so we will see if they contain any information about this.

8. **Interviewer:** Has RFID technology resulted in other noticeable changes in your company and its processes?

**Interviewee:** As mentioned before, the main changes are the ability to provide the customer with the information they need if they ask where products are. It has also helped us to get back racks that have been missing for a long time, also made the logistics process more effective with the customer that we use RFID with.

9. **Interviewer:** Does your company utilize the usage of RFID technology in its marketing strategies?

**Interviewee:** One can say that we have targeted one customer at this point and this is the customer we have focus on, the implementation have taken over a year. So what we lack now is experience and I don’t know how I should approach customers about this as it is all very new to us. So one almost need to speak from the hart, that RFID can become this and that etc. Today we only talk about this in sales meetings and when we see that there is an interest of it.

10. **Interviewer:** Does RFID technology provide valuable information that can be used within marketing activities?

**Interviewee:** At the moment not that much, it is too new. We are promoting in sales meetings that we are using RFID with another customer, and if we see that there is an interest of this we go from there. But we don’t really market that we are doing this if we don’t think there is an interest for it.

We express that we can provide them with correct information about their products right away instead of calling around to find the package, with RFID everything is already in the system. It is crucial for me to be able to communicate the benefits with the technology to get the customer to see the value of the technology.

11. **Interviewer:** Does your company promote to its customers that you are using RFID? If so, in whatways?
**Interviewee:** I don’t think it is on our website yet. However, I often mention RFID when I am on sales meetings and use it as a sales argument. So we have information about RFID in our power points to be able to show how we are working to the customer. We are telling them about the increased quality in the material flows and that it gives them the opportunity to keep close track of the goods being transported.

12. **Interviewer:** How do your customers react towards that you are using RFID technology?

**Interviewee:** It is new to most of them, if you haven’t worked with it before. Even though RFID has been around since the 80’s most people haven’t worked with it. It has been around for a long time but it has been it is still very uncommon to come in contact with.

Information is important. That you communicate that RFID will bring effectiveness, quality and economy. It is like when the computer came. It was suppose to be a paperless community but it hasn’t gotten to that point yet, even though the information flows have become more efficient. This is basically the same thing. At some point you have to go for it, in order to gain from it.

The customers that are the most suitable and more interested of this solution are the customers that are working with a high material flow, as many materials are being transported, handled and stored. These are the once that understand the added value of RFID and the increase in quality control.

13. **Interviewer:** Have RFID technology contributed to an increase in perceived customer value? If so, in what ways?

**Interviewee:** Yes in some points, we try to be a clean and tidy company that can keep a high standard, look good and represent order. RFID technology makes it possible to keep an ever higher quality and stay well-organized. This can lead to increase competitiveness as we can provide a more appealing offer than others. However, if we shall become good at working with RFID the costs of the tags and the scanners need decrease, because right now it is not very beneficial. But at the same time do we get the possibility to offer our customer something superior. And we have realized that the initial cost is the biggest one, but since we can keep track of racks that we normally...
have lost and never gotten back we save money. So maybe it isn’t that expansive at it seems.

Environment is a sales point. We measure the damage on the wheels and diesel usage, and everything else we can measure. More and more customers is demanding this from us, or at least request it. Really the customer demands it. Our key accounts, they have their environment policy, and if we can’t meet that demand, their environment policy will fail.

14. Interviewer: Have RFID technology in any way influenced your competitiveness?

Interviewee: yes, the customer that we are working with now (where the RFID is implemented). We have been working with them for 3-4 years and no of our competitors have reached out to them. If that is because we have established a relationship with them due to our professionalism, I can’t say. I guess you have to ask the customer. But since they are still with us and haven’t tried to push down the price, I think they are very satisfied with our services. At least that is what they tell us.

Our warehouse is built with a lot of security, and that is something I use as a sales point, that we have high security, our staff is trained to focus on control as well as safety. We can handle high value products, more sensitive information and things like that, as well as keep high quality. And we can do this when we receive goods as well as when we send out goods, you can for example have a tag on the car to trace it.

15. Do you want to add any other information to this interview, about RFID, that you feel has not yet been covered?

Interviewee: No I believe that we have covered most of it, we even talked about the environmental aspect.

1. Interviewer: Can you describe how your company uses RFID today?

Interviewee: We are a company that does transactions for various customers. We are using RFID because our customers are using RFID. We have the facilities and scanning possibilities needed to handle our customers’ goods as that is where the RFID technology is used. RFID is not that common, and is not used in an everyday setting. Even if we, the Norwegian part of the company do not use RFID, other parts of the company do, in central Europe, more specifically Germany. “A cargo with low value goods such as car tires is not necessary to be able to track or know where it is. Therefore RFID is better for sophisticated products of high value. That is why it is used on art and other products of a high value.”

2. Interviewer: For what reasons did you implement RFID technology within your company?

Interviewee: The main reason for this is because our customer is using RFID. We don’t have RFID ourselves, it is the customers that have RFID, and if they want we offer them help to scan their goods.

3. Interviewer: In what ways and in which processes does RFID technology contribute to your company?

Interviewee: The thing is we only need to move the cargo from place A to place B. For example, I move something from Scandinavia to China, and when I do I tell them that I can scan their goods in our warehouse, and I might organize so I can do it somewhere else. But sometimes I never see the cargo, and in that case it is really hard for me to provide that service.

   c. What influence do you think that RFID would have on your logistics process?

Interviewee: Since it is the customers that are using RFID, it does not really affect or processes since we have nothing to do with the customers RFID. I believe RFID is more beneficial for high value goods, such as art. RFID could also potentially provide a
service for the customer that allows the customer to follow up on the cargo at any point in time.

d. *What influence do you think that RFID would have on your warehouse management?*

Not addressed

4. **Interviewer:** Have your company developed after you started to use RFID technology? If so, in what ways?

**Interviewee:** As I said, we are not really affected by RFID. The only thing is that we have to possibility to provide the service of scanning RFID-tagged goods if our customers want us to.

a. *What influence do you think that RFID would have on financial aspects in your company?*

The cost, customers can not afford to pay for RFID, and if they did the RFID tags would be tossed away after it had been used once, since RFID is not that beneficial for low value products.

5. **Interviewer:** What are the advantages with using RFID technology?

**Interviewee:** I have seen, through my customers, several benefits of using RFID. Especially as mentioned before, customers that transports goods of high value or when they have to perform temperature controls etc. It is often used for medical supplies, electronics and other expensive goods. Also that RFID will provide a service for the customer, so the customer can follow their goods by tracking records which makes it possible to see what is happening to their cargo. *“It makes sense that a customer that is transporting something with a value of 2 million dollars from Norway to Buenos Aires use RFID technology, as they want to make sure they know where it is and what is going on.”*

6. **Interviewer.** What are the disadvantages with using RFID technology?
Interviewee: Once again, the cost. It is too expensive for the customers and not economical beneficial for low value goods. There is other, cheaper, tracking devices that work that aren’t as expensive to implement and use.

Moreover, you cannot reuse the tags if you put them on, for example, cardboard materials. As they are usually tossed away, you will never get back the RFID tag.

7. Interviewer: What are the noticeable changes in your company’s marketing activities since you came to implement RFID technology?

Interviewee: We tried to introduce plastic pallets that had integrated RFID tags in the Norwegian market, the pallets were not that popular at that time as the RFID tag was too expensive. Customers that looks for logistics solutions are often very price sensitive.

8. Interviewer: Has RFID technology resulted in other noticeable changes in your company and its processes?

Not addressed

9. Interviewer: Does your company utilize the usage of RFID technology in its marketing strategies?

Interviewee: No we don’t, we don’t use it as an active part of our marketing strategy, and I have never seen it as a marketing tool. We probably will use it in marketing in the future. It is the same as internet back in the days, it was not promoted either, but here it is. So if RFID get a major breakthrough and becomes popular, we will most definitely use it in our marketing.

10. Does RFID technology provide valuable information that can be used within marketing activities?

Interviewee: As it is not used in marketing at all we wouldn’t say that.

11. Interviewer: Does your company promote to its customers that you are using RFID? If so, in whatways?

Interviewee: No we don’t. Well, if I am in front of the client, then I of course tell him that we have the possibilities of working with RFID, but we don’t perform any promotion of it at all. I use it as a sales argument if I see that there is an interest of it.
12. Interviewer: How do your customers react towards that you are using RFID technology?

Interviewee: It’s not that common, and I haven’t met anyone that has it as a requirement that we should have RFID technology. However, they appreciate that we can offer them scanning facilities and possibilities.

13. Interviewer: Have RFID technology contributed to an increase in perceived customer value? If so, in what ways?

Interviewee: Since we have the possibility to provide scanning of RFID marked goods, customers that use these goods sees a value in that. If it would happen that a customer wants to scan RFID tags that we don’t have the suitable readers for, we would go buy the reader needed to make it possible. “This is a service that a logistics company should be able to provide its customers”. Normally when we use RFID technology is when the customer has it or when they want to implement it.

14. Interviewer: Have RFID technology in any way influenced your competitiveness?

Interviewee: We always try to please our customers, so I can’t say that the use of RFID is the only reason for being competitive.

15. Do you want to add any other information to this interview, about RFID, that you feel has not been covered?

Interviewee: No I am fine, just want to wish you guys the very best of luck.
1. **Interviewer:** Can you describe how your company uses RFID today?

**Interviewee:** We do not use RFID. It is very uncommon in the Logistics industry in Norway. We are mostly using bar codes.

2. **Interviewer:** For what reasons have you not implemented RFID technology within your company?

**Interviewee:** The main reason is that most companies within the logistics industry are using bar codes. However, we do get in contact that are using RFID tags in their pallets, the plastic ones but it doesn’t make it necessary for us to use it. I believe it is more uncommon than it is perceived to be in our industry. If the RFID technology was cheaper and easier to use it would have been more implemented. But today, when the technologies we are using are working we don’t see any reason to change.

3. **Interviewer:** In what ways and in which processes do you think RFID technology could contribute to your company?

**Interviewee:** Today, when we are using bar codes, our customers can follow their products and see where they are. I believe that all customers get enough information about their goods being delivered as it is today. I don’t think there would be any difference with RFID.

   a. **What influence do you think that RFID would have on your logistics process?**

   RFID would probably provide more benefits for companies that are handling products of high value as well as products that need to be temperature controlled.

   b. **What influence do you think that RFID would have on your warehouse management?**

   RFID would probably not improve or warehouse management since we are handling low value products.
4. Interviewer: If you started to use RFID, how do you think RFID would develop your company?

Interviewee: We have been talking about putting RFID tags on some goods, but as there are no standard we don’t think it is possible to change from bar codes. We will start to use it if some large company will tell us to, like IKEA for example, if they say that we need to implement RFID, we will and this will also make us willing to pay for it. One of the major players in the market needs to start using the technology, and then I think others will follow. I believe that there will be a new technology in the future, and we will have to adapt to the new technology if our customers asked us to. If it will emerge new demands tomorrow we will be forced to adapt.

a. What influence do you think that RFID would have on financial aspects in your company?

What I have understood, RFID technology is really expensive in comparison to bar codes, and we are very price sensitive in our industry. As previously mentioned if RFID less expensive and the technology were not as complicated it would provide more benefits and therefore probably more companies would use it.

5. Interviewer: What do you believe are the advantages with using RFID technology?

Interviewee: RFID is most common for temperature control. As far as we know, RFID is probably better for sophisticated products that are of high value, such as art. An advantage with RFID is also that it provides you with more information, which is important.

6. Interviewer. What do you believe are the disadvantages with using RFID technology?

Interviewee: As I said before, I think that RFID technology is really expensive in comparison to bar codes. It is not necessary with RFID on low value goods, I believe bar codes are good enough for those products. Furthermore it is too complicated and it is also hard to implement as there are no standards, but if there would be a standard solution that are international we may start using it
7. Interviewer: If you were to implement RFID technology into your company, what do you believe there would be any noticeable changes?

Not addressed

8. Interviewer: If you were to implement RFID technology into your company, what do you believe would be the most noticeable changes in your company’s marketing activities?

Interviewee: No, not if our system looks like it does today.

9. Interviewer: Do you believe that your company would utilize the usage of RFID technology in its marketing strategies?

Interviewee: Today we express that we would solve the customers problems, but the technology we use to do so we never promote or use actively in marketing, the customers are not interested of that. We want to show the customers that we can deliver their goods, fast without causing any damages all over the globe.

10. Interviewer: Do you believe that RFID technology could provide valuable information that can be used in marketing activities?

Not addressed

11. Interviewer: Would you promote to your customers that you are using RFID if you did? If so, in what ways?

Interviewee: I don’t think we would, we would focus on solving the customers problems.

12. Interviewer: How do you think you customers would react if you were to implement RFID technology?

Interviewee: The customers are the one that will have to start using RFID for us to start using it.

13. Interviewer: Do you believe that RFID technology would contribute to an increase in customer value? If so, in whatways?
**Interviewee:** Most customers are choosing us today as we are easy to work with and perform good follow ups. I don’t see a reason to change our technology as they are pleased today. But of course if one of our customers or their suppliers chose to change their technology we would have to change too as we are the one transporting their good we have to understand the technology used to take part of the information.

14. **Interviewer:** Do you believe that RFID technology in any ways would influence your competitiveness?

Not Addressed

15. **Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?**

**Interviewee:** I believe that you have to go to the companies that store, handle and deliver valuable goods as these companies more likely will have more advanced systems. Our company has a limited impact on the logistics industry.
Interviewer: Can you describe how your company uses RFID today?

Interviewee: We do not use RFID in our company, but I know people and companies that do, and I have experience of RFID from previous companies I have worked in.

Interviewer: For what reasons have you not implemented RFID technology within your company?

Interviewee: Our industry looks like this; we only sell two things and that is place and price, and then how efficiently you can store the goods for the customer will determine the place and price, hence how much money we can make. In the company I worked for before this one, RFID was a requirement. However, it was shown that even though we had to use it, no customer was willing to pay for it. I have talked to some people in the industry with RFID experience that believes it is impossible to make any money on this, and that it is not worth a single penny (SEK). In the logistics industry the only thing that matter is how efficiently the goods are packed, stored and transported.

Interviewer: In what ways and in which processes do you think RFID technology could contribute to your company?

Interviewee: I believe that for manufacturing companies RFID will have a big effect, it already does, and they are very good at the active processes. Also some logistics companies do use RFID to be able to track their goods, but I don’t think it is something that you can make money on. I think now when extremely talented students graduate from the universities, with their activity based costing, they can in a bare moment cut down the cost to half by making warehouses more effective and efficient. Then RFID and its tags won’t have much influence, since the goods are always in movement.

What influence do you think that RFID would have on your logistics process?

Interviewee: Mainly I think RFID could make the logistics process shorter as well as quicker, which can be of great value to the customer. If we would have larger account with bigger flows, we could probably save money on human labor.
b. What influence do you think that RFID would have on your warehouse management?

Not addressed

4. Interviewer: If you started to use RFID, how do you think RFID would develop your company? If so, in what ways?

Interviewee: I don’t think this part of the organization would develop that much from the use of RFID, but of course the company as a whole would. I know that there is another part of the company that is located in another country would probably gain a lot from having RFID since I know they have a very large account that uses it. But not here with us, as we don’t deal with the same extreme volumes as they do.

a. What influence do you think that RFID would have on financial aspects in your company?

Mainly as I mentioned before, if you invest in RFID no customer will be willing to pay extra for it.

5. Interviewer: What do you believe are the advantages with using RFID technology?

Interviewee: If you have larger account with larger a logistics flow, then I believe one advantage is the money that can be saved on human labor. The logistic process will probably benefit and create an advantage as RFID can potentially shorten the logistic process which will bring higher customer satisfaction.

6. Interviewer: What do you believe are the disadvantages with using RFID technology?

Interviewee: I don’t believe in disadvantages. I think if a product would have disadvantages they would not be able to breakthrough and succeed in the market. I believe the products with disadvantages are removed from the market in the first process they enter, so they would be gone within three to six months. But that is just my personal opinion.
7. **Interviewer:** If you were to implement RFID technology into your company, do you believe there would be any other noticeable changes?

**Interviewee:** We had a customer that wanted to implement RFID to decrease the amount of human labor and in that way to save money. However the amount of goods that they had was too small to implement it, because you have to reach a certain amount in order for it to be profitable.

Of course it would cut down the labor in the warehouse and save time. However I have a hard time seeing that our company will reach that point where we implement RFID any time soon, if even ever. However, I think that it might be an expensive implementation in this point in time, but in soon future someone will bring the concept to for example India, where a copycat of RFID can be produces, and the price of the RFID tag will decrease substantially.

8. **Interviewer:** If you were to implement RFID technology into your company, what do you believe would be the most noticeable changes in your company’s marketing activities?

**Interviewee:** I don’t believe that RFID can make any noticeable changes in our marketing activities. Even though I do not question the value of RFID, the customers does not want to pay extra for it, I think that in the future they will just expect you to have it. It will just be a small part of a bigger system; we just have to provide it as part of the package. I think it will be for us like it was for Wal-Mart’s suppliers, when Wal-Mart implemented RFID. If the suppliers wanted to keep the collaboration with Wal-Mart they had to implement RFID, or else they were excluded from Wal-Mart’s list of suppliers.

9. **Interviewer:** Do you believe that your company would utilize the usage of RFID technology in its marketing strategies?

**Interviewee:** No, as I said before, people will expect you to have it since it will improve the process, but people are not willing to pay for it. I don’t think that people will care much for marketing RFID in any sense, as long as the customers’ needs are met, they will not care in what way. It is a package deal, if I can deliver what I am
supposed to in the time my customer wants, then they will not care if I had to use RFID to get it there.

10. Do you believe that RFID technology could provide valuable information that can be used within marketing activities?

Not addressed

11. Interviewer: Would you promote to your customers that you are using RFID if you did? If so, in whatways?

Interviewee: Logistics will always be about packaging efficiently, and the whole industry sells the same thing and the same ideas. I don’t think you could promote RFID since by the time it starts getting common everyone will have it, and then it would be like promoting that you have internet. I think it will have a similar breakthrough; it will enter into the larger enterprises, especially the car industry. Then they will start having demands on the rest of the supply chain, and who ever don’t get on the train will be out. Then I think it will become a part of the lean process, where RFID is used to shorten the process, so no one will be able to single out just one thing, in this case RFID, to market that aspect.

12. Interviewer: How do you think your customers would react if you were to implement RFID technology?

Interviewee: Our customers have to small amounts of flow in our warehouse for it to be beneficial for them, they would not be able to make any profit on if we implemented RFID.

13. Interviewer: Do you believe that RFID technology would contribute to an increase in customer value? If so, in whatways?

Interviewee: Of course RFID contributes to an increased value for the customer. But as it will be a part of a package I don’t see how this value could be communicated to the customer.

14. Interviewer: Do you believe that RFID technology in any way would influence your competitiveness?
Interviewee: If we were the only ones that had implemented RFID and none of our competitors, then yes, of course. I think all larger enterprises will implement RFID within just a few years, and then all we smaller enterprises just have to follow not just to stay competitive, but to be able to stay in the market at all. However I do not believe that anyone would be willing to pay for it, it will just have to be one of those things that is required to have.

15. Interviewer: Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?

Interviewee: Yes, for RFID to get its breakthrough, I believe that someone must make money on it. Otherwise it will be like internet, as mentioned before. However, I think that the car industry is the one that will make the most use of RFID. It will start there, they have the biggest logistic flows, they are growing the fastest, those are the people that push to develop SCM and logistics further, and those are the sharpest people within logistics.
1. Interviewer: Can you describe how your company uses RFID today?

Interviewee: Not at all.

2. Interviewer: For what reasons have you not implemented RFID technology within your company?

Interviewee: Well, it just has not been on our mind, we don’t see a reason for it. You should know that this industry is very traditional and not very keen on changing, we are very paper based and even if you don’t believe it, everything is manually handled. And I do not think that anyone within the transportation industry is using RFID either. Companies are using bar codes, and they are scanning as well as measuring the weight of goods manually.

We haven’t gotten to the point where we think implemented RFID is important. Even if people within our industry are talking about that you could go around by truck and put RFID tags on everything, as this will help us to become be able to follow the flows within our warehouses. Even though this is a nice idea, we don’t have any problems with waste, we have a good quality when sending away orders and they are not often wrong. This is the major reason to why we haven’t considered RFID, it wouldn’t help us. We don’t have any customers today that are using RFID that I know of. They might have marked their products when they are produced, however, we wouldn’t know about that since we are not involved.

Furthermore, we are using bar codes which is working totally fine, and it wouldn’t make sense to invest in a new technology when we already have a quite modern technology that are working without any problems.

3. In what ways and in which processes do you think RFID technology could contribute to your company?

Interviewee: If you could imagine the use of RFID, where you just took the products and drove them through a port and everything was scanned while receiving or sending out products, then that would provide evidence for the customers of what we are packing and sending is correct. We will someday get to that point where we must be
able to prove for our customers that we can pack right. It is a part of the business, we need to be able to deliver the right products to the customer when they are needed. Moreover it would be possible to reduce time spent on otherwise time consuming processes.

a. What influence do you think that RFID would have on your logistics process?

It might increase the efficiency, and quality of the deliveries, and it would be a good way to provide the customers with evidence that the product actually has been delivered. To keep a customer we need to be able to meet the customer demands and deliver as promised. We could also save a lot of time we now spend on scanning every single product through a manually process. “RFID takes this process to another level as one can scan the wrong bar code, but with RFID one can see the exact information of the delivery right away.”

b. What influence do you think that RFID would have on your warehouse management?

RFID would improve our internal flows of products, to see where products are within the warehouses. Also within our warehouse if we scanned the products automatically by going through a port and scan every product which will provide more evidence for the customer for see how we perform, which would increase our efficiency.

4. If you started to use RFID, how do you think RFID would develop your company?

Interviewee: There is a possibility that we would be able to decrease the human errors, however, not completely as there are humans that need to put the RFID tag on the product, they can still miss one product. It is also a chance that we can become more effective. Especially when we receive goods, as this is the most time consuming part of our business. If it would be possible to scan 100 goods that have RFID tags at once it would of course make the process more efficient, but if this is possible I don’t know. If the process when we are receiving goods becomes more efficient it would be possible to save a considerate amount of hours spent on this process otherwise, hypothetically we might even reduce the time spent on this process in half. And of course if we can make this process both cheaper and faster we will become more competitive.
a. What influence do you think that RFID would have on financial aspects in your company?

The high cost of implementing a RFID system, not only the RFID tag but also the hardware, software etc. We don’t have the money for that, as the marginal for benefits aren’t that high in the industry today. We might have a couple of SEK in marginal on every package we deliver. But we don’t have any more marginal. And that marginal would completely disappear from the cost of the RFID tag. And when thinking about it, if we were to mark everything with a RFID tag it would be extremely costly. Then we would stand there with no profit at all. You have to consider, should you lose your profit to increase customer service? I don’t think so. We can say it like this, if we would implement an RFID system, we would pack better and make less mistakes, and also know where the flows are going but that will cost a lot of money. But yes, then we wouldn’t make as many mistakes, but once again we don’t do a lot of mistakes today.

5. Interviewer: What do you believe are the advantages with using RFID technology?

Interviewee: Everything that can provide us with proof that we do our packing correctly is in our interest. Even if our packing error percentage is very low, there is a demand from the customers that they want proof of that we pack and send, and that it is correct. With RFID you would be able to prove exactly what products that was sent and at what time. That we print a list that someone later signs is not a proof. We have started with scanning bar codes, because that is one type of evidence, one will see when the bar code is scanned. It is an extra moment that take time, however not that much of time.

If RFID would get a major breakthrough, then we would probably have to demand it from the beginning of the process, in production. Thus, make sure that all products are marked from the beginning, and this will also lead to higher security. It would make the whole logistic process more efficient, and as there would be an ID on each product that would go through the supply chain it would be follow the product through the entire process. This would really create a lot of efficiency for us, because today we mark everything that are missing identification with new bar codes by our self before distributing the products. When we get a product from a supplier that does not have any
identification, then we will get them a bar code to be able to handle them internally, it would have been more efficient if this was done from the beginning.

6. **Interviewer. What do you believe are the disadvantages with using RFID technology?**

**Interviewee:** It is hard to decide on what level one want to mark the products, should we mark all of them or just the bigger box with several inside. The RFID solution has to be cheap enough so that one really can benefit from using it.

RFID has not gotten its big breakthrough that it was expected to get, it has not become as popular as it was thought to become. However, many shops mark their products with RFID to prevent steeling etc, and in situation like these I can see a clear reason for using it.

It is really expensive to invest in a new system, and then we have to increase the prices for our services, which customers realize but maybe don’t want to pay for. I believe that the amount of mistakes we perform today is okay, it is on such a small level that customers are accepting it. There are some challenges that we can overcome, but to make it profitable to overcome these with RFID the tags need to get cheaper so that we can benefit from it. It is also important to remember that RFID is a technology, things can go wrong.

7. **Interviewer: If you were to implement RFID technology into your company, do you believe there would be any noticeable changes?**

**Interviewee:** I can only refer to how we are doing it today, we are scanning all the bar codes when something gets into the building and every time products leave the building. But, it would be great if it was possible to increase the security of this, to make sure that it really happens. When scanning bar codes there is always important to see the human factor, and it’s not totally uncommon that bar codes are missed. If we would use RFID and use some kind of “bow” it would just work if the tags were properly attached to the products, so there are a possibility for human errors in the RFID system too. There is still a risk that the company won’t be able to deliver 100% right all the time. However, as mentioned before, RFID could efficiency, quality of the flows as well as provide
more evidence of Performa to the customer. Once again; to keep a customer we need to be able to meet the customer demands and deliver as promised.

8. Interviewer: If you were to implement RFID technology into your company, what do you believe would be the most noticeable changes in your company’s marketing activities?

Interviewee: As mentioned before, we are in a very traditional industry, we don’t really feel it is necessary to change more than we have to. However, this business is always exposed to customers that want to push down our prices, which makes it impossible for us to make any major profits. It would have been good to find a way to become better. “The only way for us to make more profit is to become even more efficient in what we are doing, become faster, increase the security and keep a high quality. If we can do this we will become more competitive, and this is when we can increase our monetary benefits“. If we can increase our efficiency we can earn more than our competitors, we will also be able to keep customers as we will be able to deliver in a good way. As we cannot increase the price, as the customers won’t stay with us if we do, we need to become more efficient to be able to increase our profits and to stay competitive. If we can truly show that we are using RFID and that it can be confirmed that RFID will help our company to always send away the right things in an order, then it would have been interesting and this would also increase our competitiveness as customer always want us to deliver the right thing.

9. Interviewer: Do you believe that your company would utilize the usage of RFID technology in its marketing strategies?

Interviewee: Customers today wouldn’t stay if we would increase the price for our services. The only way for us is to become more efficient to keep customers, they demand that we always get better and are working to develop ourselves. If RFID would help with this I guess we can use the technology in a way to find new and keep customers.

10. Do you believe that RFID technology could provide valuable information that can be used within marketing activates?
**Interviewee:** We can say like this, if we would have been using RFID we might become really effective at packing and deliver the right goods to the right customer and always be able to see where the things are. This would probably been a way to win customers. However, it is in extreme cases, we can already provide customers with this information as all the products passing through our facilities are marked with bar codes, and this information is then stored and every time the bar code get scanned that new information will be available. Maybe we won’t be able to say that the products are on highway X, but we can at least say that it is on its way.

11. **Interviewer:** Would you promote to your customers that you are using RFID if you did? If so, in what ways?

**Interviewee:** I can provide you with an example, for our biggest customer we pack 15 pallets a day and we get one report a year where the delivery for some reason has been off. If we were a bigger company, with more employees we would probably invest in systems and technical solutions as there are a bigger work force with a lot of inexperienced people. I believe this would make the process more efficient. This would probably also give the evidence needed to show the customers that one can deliver as promised. We can already do this now as we barely make any delivery mistakes.

I also believe, that if we were to sell a RFID solution to our customers we be forced to explain the technology, the process and the benefits. They don’t have the knowledge needed to understand what RFID is or what it can do for you. I literally don’t think the customer cares about the process or the technology as long as we can deliver as promised.

12. **Interviewer:** How do you think customers would react if you were to implement RFID technology?

**Interviewee:** We always get in contact with our customers when we will invest in some new solution. I don’t know how they would react. But, if they were to demand this solution from us I guess we have to solve the situation, especially if it is a key customer. You have to weigh the benefits of the system with the costs of implementing it, and as we see it right now RFID wouldn’t provide us with anything. I dint believe that any customers would demand that we can handle their products with a RFID system.
My perception is that not many people know what RFID is, and the ones that do, I don’t think they have the knowledge to say what the benefits are.

I don’t think that some of our customers would be interested at all, the ones that have large products that weigh up to a ton, they wouldn’t be worried as it would be impossible to lose these products.

13. Interviewer: Do you believe that RFID technology would contribute to an increase in customer value? If so, in what ways?
Interviewee: if we can become more efficient and handle bigger flows, then of course you will increase customer value. However, we believe that we can do this without RFID. The most important aspect is that we are able to take care of their products and deliver when it is needed. Make sure that nothing get lost and make constant inventory controls so that we can keep them updated. But we are already doing this in a good way so I am not sure that RFID would help with this.

“The more efficient we are when handling customer goods, the more value the customer perceive. If the customer sent in an order yesterday, the best possible solution would be that they received their goods yesterday”. But this will of course never be possible.

14. Interviewer: Do you believe that RFID technology in any way would influence your competitiveness?
Interviewee: as I said before, the demands is always increasing, and the whole society is built on control and that you are able to always provide proof that you have acted in the most appropriate way. At least if something goes wrong, then you need put in more time and money into some process that will help you provide proof of your innocence.

This process can take 5 or 15 years to get in place, it always takes longer than you think to implement technology. The customers have demands on us Logistics companies and they are always increasing. And today you have previously tested methods and of substitutes that you can or are working with, RFID is still very new. For an example, bar codes and such has not been around for a long time, about 10-15 years ago all transport handling was 100 % manual. "The amount of paperwork was overwhelming”. We still have a lot of paperwork, but it is still working with the use of bar codes. It is the last couple of years that technology really has been implemented in the processes within logistics. RFID was already an option 10 years ago, but it was too expensive and
therefore you went with other options. “As companies have invested in other options of systems and put a lot of money in this, it makes it harder to move on with new implementations. Mainly because you are still using something that is quite new, and it will continue to work for a long time”

15. Interviewer: Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?

Interviewee: No. But I would find it very interesting to take part of the information you are able to gather regarding marketing and the possibility to utilize RFID in marketing, it would be nice to see what you reach for conclusion.
1. Interviewer: Can you describe how your company uses RFID today?

Interviewee: Not at all.

2. Interviewer: For what reasons have you not implemented RFID technology within your company?

Interviewee: I have during my years in supply chain management seen RFID solutions many times. However, I have never seen it fully implemented. We have discussed it internally as we have a large amount of different goods that would have been easier to handle with the help of RFID technology. There is an interest of implementing RFID, but it would be preferable if a larger player in the market does it first, this will also force other companies in the industry to implement it. We don’t mind if we are one of the companies that implement RFID first, however, we do not feel that it is necessary to be the absolutely first one.

3. Interviewer: In what ways and in which processes do you think RFID could contribute with to your company?

Interviewee: When looking at RFID, hypothetically speaking, one will be able to keep track and increase the visibility which would improve many processes, especially the ones when products are delivered to us and then when products leaves our facilities and are delivered to the customers.

a. What influence do you think that RFID would have on your logistics process?

If we would implement RFID it is important the majority of the supply chain is using the same system, so we would get the full benefits from RFID such as an increased visibility, so the whole supply chain can use the same technology and gain superior benefits.

The amount of waste will most definitely decrease, as all inventory processes would get better. An RFID investment would bring improvements, provide for control over the whole process. And the process of when products are delivered from our facilities we
will be able to insure that the right product is in the right box as well as see the time schedule.

\[b. \text{ What influence do you think that RFID would have on your warehouse management?}\]

We would be able to see what is delivered to and from us, we would also be able to in an effective way check inventory levels and see where in the facilities all the different goods are located. Furthermore, RFID would create a good opportunity to quickly see what products it is on a specific pallet or in a box, as well as being able to scan it of quickly in a smart way so it is less time consuming. We will also be able to keep a better control of our inventory, now we have one of these packages left our warehouse. This process will be quicker if it is atomized. Today we track and trace products by using bar codes, manually. You would save time if you did not have to scan every little package. Potentially, the customers security stock would minimize due to customers will be able to perform inventory controls extremely fast comparing to counting one product at the time. This would also decrease waste.

4. **Interviewer:** If you started to use RFID, how do you think RFID would develop your company?

**Interviewee:** We would be able to decrease otherwise time consuming processes and become more efficient.

\[a. \text{ What influence do you think that RFID would have on financial aspects in your company?}\]

RFID has decreased in cost since I started in the business 15 years ago, I believe companies must weigh cost against benefits to see if the company can create a true value.

5. **Interviewer:** What do you believe are the advantages with using RFID technology?

**Interviewee:** The benefits could be, when we receive deliveries from the suppliers, then we will have a really good opportunity to quickly see what products it is on a specific pallet or in a box, as well as being able to scan it of quickly in a smart way so it is less
time consuming. As mentioned before, an overall improvement over the whole logistic process would be possible including inventory control.

If we have 10 people working with the goods we receive, we would at least cut that number in half if we implemented RFID.

Special or unique products would definitely benefit from RFID, as well as high value products. Because you can track and trace those products directly, this will provide the customer with more control and build trust. There are a lot of times when we have four products in our system, but there are only 2 products of that kind in the actual warehouse, which makes it hard for us to uphold good delivery. If all products would have RFID tags, that mistake would be hard to make. We have waste today, but that is to a minimum since we have a good system from our bar code scanning, but of course there is always the human factor that can make mistakes and forget to scan one of the bar codes.

However, as mentioned before, it is quite costly to implement and individual companies has to weigh the pros and cons against each other, I believe that in the end one will save money through making the facilities and processes more effective.

6. Interviewer: What do you believe are the disadvantages with using RFID technology?

Interviewee: The cost of RFID technology have decreases since I started to look into RFID 15 years ago, so I don’t believe that it is the price that are the most important thing anymore. Rather, the complex technology that are difficult to build and all the equipment on all different places one need to utilize RFID. It is also hard to demand from our customers that they should start using RFID as we are the ones working for them, we are not the ones with the possibility to demand different things. But if one of our major customers would implement RFID and we could do it together and share the costs it would have been a win-win situation.

As mentioned before, it is important that the majority of the supply chain also have implemented RFID, so the supply chain is using the same system. Otherwise we would have to have two parallel processes throughout the organization. One material flow that are using RFID technology and then another one that are using bar codes. This will in
turn lead to that the employees need to learn these, have the equipment to manage these two different processes and this will in turn be costly.

I am also unsure how it is, if someone can hack RFID codes and by that reach the signals on our products, maybe even through a wall. If this is possible it would be a major security issue as we are working with secrecy with many customers, that unauthorized people would be able to see what we are keeping in our warehouses would be really bad.

7. Interviewer: If you were to implement RFID technology into your company, do you believe there would be any noticeable changes?

Interviewee: As mentioned, the amount of waste will most definitely decrease, as all inventory processes would get better.

8. Interviewer: If you were to implement RFID technology into your company, what do you believe would be the most noticeable changes in your company’s marketing activities?

Interviewee: We would not scream that we are using RFID, however we would communicate that we are using a technology that will help with this and that.

9. Interviewer: Do you believe that your company would utilize the usage of RFID technology in its marketing strategies?

Not addressed

10. Interviewer: Do you believe that RFID technology could provide valuable information that can be used within marketing activities?

Interviewee: I believe you can get a lot of information through the use of RFID. As the information would come to us automatically without scanning each box would make our processes more effective, which is really good and would have made us more competitive. We use all information, and the more information one can get about something the bigger possibility it is to improve something.

11. Interviewer: Would you promote to your customers that you are using RFID if you did? If so, in what ways?
**Interviewee:** I don’t think we will start screaming that we have RFID, however, we would say that with the help of technology we are able to this and that, thus create a stable deliver quality and can be a stable organization.

12. **Interviewer:** How do you think your customers would react if you were to implement RFID technology?

**Interviewee:** If we would say to our customers that we are using RFID, and that we think this will improve our efficiency and that it might even allow us to push down our prices, then I believe we would gain competitive advantage. We are actually talking to some of our customers about this and all the benefits it can contribute with. But as it is now, no one of our customers demand that we have to use RFID. We are all following the development of RFID to see how others are doing, and to see who that will make the first investments in RFID. I believe it is important to have an open conversation with all of our customers to see if there is an interest for RFID.

13. **Interviewer:** Do you believe that RFID technology would contribute to an increase in customer value? If so, in whatways?

**Interviewee:** I believe we would provide an increase value for the customer as we will be more efficient throughout the supply chain, the customers will therefore be able to sell their products faster as we would be able to work faster and keep a high quality on the deliveries, we might even have the possibility to decrease our prices.

14. **Interviewer:** Do you believe that RFID technology in any way would influence your competitiveness?

**Interviewee:** I believe that we would become more competitive with RFID, as we will reduce the delivery times, actually the time in the entire chain of materials, by always be able to see where all the products are. This will also lead to that the customers will be able to decrease their inventories and minimize the time the products is on the shelf. We would be able to meet their demands on fast and correct deliveries.

15. **Interviewer:** Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?

**Interviewee:** No.

1. Interviewer: Can you describe how your company uses RFID today?

Interviewee: We use the RFID tags as access cards as well as in our warehouse and logistics system. The tags are used in the terminal to scan goods. These are the main areas where we use RFID.

2. Interviewer: For what reasons did you implement RFID technology within your company?

Interviewee: Before we implemented RFID we had another system, however, this was not adjusted to the way we need to be able to scan our goods, and therefore we implemented our new RFID system in 2014. It was a new concept to us, however, other parts of the organization had been using RFID for some time, so we were familiar with the concept and this was one of the reasons why we chose to implement RFID. Also, since other parts of the organization already had the knowledge of how to use the system, we could save money through having internal education of the system, instead of hiring expensive consults.

3. Interviewer: In what way and in which processes does RFID technology contribute to your company?

Interviewee: The biggest contribution of RFID is on the change of the human factor. By using RFID we can reduce the human errors in the logistics process, such as packing and preparing for deliveries and other similar processes in the warehouse. This saves our company a large amount of time and money, and the processes become more effective and efficient by reducing the manual handling.

Inventory processes have now become atomized, which saves time for both our customers and us.

   a. What influence do you think that RFID has on your logistics process?

As mentioned before, we have been able to reduce human errors and over all made our logistic process more efficient and effective since it has become atomized.
b. What influence do you think that RFID has on your warehouse management?

We have seen big and positive change in our inventory, as mentioned. Clients used to have to send over their own staff once a year in order to calculate their inventory in our warehouse. However, since we implemented RFID into our system, inventory is calculated automatically, in real time, saving both time and money for our customers and the atomization of inventory.

4. Interviewer: Have your company developed after you started to use RFID technology? If so, in what ways?

Interviewee: Yes, we are more up to date with the modern technology and we are able to keep up with today’s demands and expectations. But of course, there is a constant development of IT that you need to keep up with.

a. What influence do you think that RFID has on financial aspects in your company

Of course the cost of the implementation is quite high, but you have to weigh it against the benefits. Since we implemented the system it has exceeded our expectations and the implementation went very smoothly.

5. Interviewer: What are the advantages with using RFID technology?

Interviewee: The biggest advantages are the reduced human errors, more effective and efficient processes resulting in saved time and money, and the atomization of inventory.

6. Interviewer: What are the disadvantages with using RFID technology?

Interviewee: The biggest disadvantage with RFID is that our system becomes dependent on the technology in order to function. What would happen if the system were to stop working? Of course, we have a manual response management that we can use if something would to malfunction. But the bigger problem would be if we would have the resources that it would require to run everything, in terms of human labor and such.
7. Interviewer: Does RFID technology provide valuable information that can be used within marketing activities?

Interviewee: The information that is gathered is among other things used for statistical reasons. The information can show how human error has decreased and how it influences the customer. The statistical information is used in marketing, and shows in numbers the benefits of RFID.

It also allows us to get an overview over how all our customers are performing, which is great since you can help support the customers better and good business for our customer is good business for us. By having RFID no customers fall through the cracks, which could happen before, instead we will instantly see if any of our customers need extra support and also follow their development. This has also improved our communication and relationship with our customers. You could say that we are more up to date now with what our customers need and want. This was not possible before, when everything was handled manually.

8. Interviewer: What are the most noticeable changes in your company’s marketing activities since you came to implement RFID technology?

Interviewee: The time and money that we save in the processes, which can be communicated to our customers. Fewer errors, less cost, and happier customers.

9. Interviewer: Has RFID technology resulted in other noticeable changes in your company and its processes?

Interviewee: We partly implemented it so that we could offer the customers scanning at all times, so the customers can track and trace their inventory and also see stock levels from their own office without having to be physically here. Then we can be more up speed with the requests the customers have for us, which is especially important since we are working within shipping, where products are not moving especially fast.

10. Interviewer: Does your company utilize the usage of RFID technology in its marketing strategies?

Interviewee: We can now put forward that we can handle the entire process for the customer, from the minute we get the goods until the minute it leaves our hands. This
allows the customer to focus in their core business and leave the other part to us. The customers that utilize our RFID system are very satisfied with the service it provides. It helps strengthen our customer relationship and with time helps build trust, which is very affirmative. These good relationships are then later used as references for our new customers, if they want to get more insight into how we work and how the system works. To be able to offer our customer references are very beneficial, since they often want to look at, and understand the concept before deciding and purchasing it.

11. Interviewer: Does your company promote to its customers that you are using RFID? If so, in whatways?

Interviewee: Yes, we communicate to our customers that we use RFID. Personally, I am in contact with all our key accounts, so during our meetings I put forward RFID to the customers. I was not there during the implementation itself at our warehouse; however, it is very important for me to know everything about the system so that I can communicate this is a good way to the customer.

Our marketing department also put forward our use of RFID and make sure to communicate it to the customer, which has resulted new accounts. We recently won an account just because the fact that we use RFID, otherwise we would never had signed that customer.

Both in our marketing of RFID and when we sell our service/product, we make sure to out forward the benefits of RFID, which also means that these are benefits that we have to be able to deliver.

Since the system is so new with us, we have not yet had the time to start marketing RFID in brochures. Currently, we mostly market it through personal communication to the customer, but we are planning to start marketing it both through brochures and online in the future. We are now trying to figure out how we would communicate it to the customer in the best way, since there is a big variation among the customers regarding their experience and knowledge about RFID.

12. Interviewer: How do your customers react towards that you are using RFID technology?
**Interviewee:** Some customers that do not have previous knowledge about RFID and its benefits, might experience the concept slightly too innovative. However, when we have explained the concept and shown how it works, the perception normally changes. Some are still a bit nervous when implementing it, but after experiencing the benefits of the system and how it makes the process more effective and efficient, they change their perception about RFID and outcome is very positive.

Normally smaller companies have very little knowledge and experience with RFID which increases nervousness about the system, while the medium sized companies have more knowledge and are very interested in the benefits that the system can provide. These are our main targeted segment, as the larger companies already have their own solutions which we have to adjust to. We normally explain about how RFID enables automatic traceability, the possibility to control and check up on the product from any location, and how it minimizes errors by removing the human factor.

13. **Interviewer:** Have RFID technology contributed to an increase in perceived customer value? If so, in whatways?

**Interviewee:** When we sign a new account we feel that it is very important to involve the customer and have an open and clear communication. Our customer relationships have become stronger and RFID allows us to work closer together with our customer. Our customers are very cooperative which make it easier for us to do a good job.

14. **Interviewer:** Have RFID technology in any way influenced your competitiveness?

**Interviewee:** We implemented RFID to improve our third party logistics as well as make the labor in our warehouse more effective and efficient, this to become more competitive to improve the relationship with our current customers but also to gain new customers. This system allows our customer to have control over their goods, without needing to be here, that is the service we want to be able to offer our customers.

If we would not have implemented RFID then we would have risked losing some customers to competitors with similar systems. So you could say that we felt that we had to implement RFID to stay competitive.
15. Interviewer: Do you want to add any other information to this interview, about RFID, that you feel has not been covered?

Interviewee: No.
Descriptive Report 8 – Company H (2015)

1. **Interviewer:** Can you describe how your company uses RFID today?

**Interviewee:** We use RFID mostly in our internal logistics process, in our central warehouse in Sweden. We have load carriers in our warehouse in which all good that is being sent out is packed, these load carriers take the shape of boxes which are sent out to smaller warehouses around Sweden, where the goods will continue on to the customer and the boxes will sent back to us. Those boxes are what we mark with RFID tags.

By having the boxes marked with an RFID tag, we can automatically identify where those boxes are. We have several stations inside our warehouse, where we can identify where the boxes are located, then we it is time to send them to the next warehouse we can see that the box is loaded onto the right truck and when it leaves our warehouse. This means that we can automatically control that each box are transported to the right warehouse, and if a box is loaded onto the wrong truck then an alarm goes off and we can instantly correct the error. The system keeps track of what has been loaded and sent off and what has not.

2. **Interviewer:** For what reasons did you implement RFID technology within your company?

**Interviewee:** There are two primary reasons for why we implemented RFID; the first reason is to be able to keep track of the boxes of which we use in our warehouse and for transportation. These boxes are expensive and by knowing where they are located, we can ensure that the boxes are returned to us after the goods have been delivered to the second warehouse. If a box is lost somewhere on the way, then we can simply see who is responsible and invoice them for the cost of the box. Hence, one reason for the use is for internal and financial reasons.

The second reason that we implemented RFID has more to do with customer satisfaction and customer value. We can now track boxes within our warehouse, and ensure it gets on the right truck, which increase the value for us as well for the customer.
3. Interviewer: In what way and in which processes does RFID technology contribute to your company?

Not addressed

a. What influence do you think that RFID has on your logistics process?

Interviewee: Overall all our processes have improved; we do fewer mistakes and can keep better control over what is on our trucks and where it is going. We do have such big flows and therefore small mistakes become a lot bigger later in the process. For example, if we make one mistake in the warehouse, say we send one box with the wrong truck then this can affect 60 customers later in the process. So by using RFID that automatically detects errors we can keep these problems to a minimum and our delivery performance have hence improves a lot.

b. What influence do you think that RFID has on your warehouse management?

Interviewee: As mentioned before, by being able to track the boxes in our warehouse, and ensuring that each box gets loaded onto the right truck and delivered to the right place, this makes it possible for us to hold higher standard on our delivery performance. And since we have such a large flow of goods in our warehouse it makes a major difference. Also since we implemented RFID the working process in our warehouse has improved, since the process is more atomized and there are less manual steps that need to be addressed.

4. Interviewer: Have your company developed after you started to use RFID technology? If so, in whatways?

Interviewee: I believe it is a better process now, with fewer errors. This system eliminates a lot of human errors, and even though we did not have a lot of errors in our process prior to the implementation of RFID, our material flow is so large that even minor errors caused big impacts on our delivery performance.

a. What influence do you think that RFID has on financial aspects in your company
Well, it is a big investment so one needs to look at the investment compared to the benefits for implement it. It is important to calculate if there is any winning of implement RFID, as could it pay off itself?

5. Interviewer: What are the advantages with using RFID technology?

Not Addressed

6. Interviewer: What are the disadvantages with using RFID technology?

Interviewee: Not really, I cannot see any disadvantages. However, you need consider the initial investment, will it pay itself off, will it eliminate any flaws, and will it meet a need in the company are questions you need to ask yourself. You need to analyze if it will be worth it, but that is an assessment you have to do in all investments. But off course, it is not a bad thing to gain more control over the logistics through an atomized system.

7. Interviewer: What are the most noticeable changes in your company’s marketing activities since you came to implement RFID technology?

Not addressed

8. Interviewer: Has RFID technology resulted in other noticeable changes in your company and its processes?

Interviewee: As mentioned, not only our working processes have improved better, fewer errors and the return on the investment in RFID was very fast. Before we implemented RFID we did a spreadsheet to analyze the cost of implementation versus how much we would gain from not losing any more boxes and money saved on human errors made in warehouse and transportation.

However, the RFID system that we use is also going to be implemented into our company but in Norway, only they are going to take it one step further and put RFID tags on each item being transported, this will then be attached to our track and trace system, which is available to our customers. Then we will be able to keep our customers updated on every on each step of the way that their ordered product take. This is a service we will offer our customers, to increase the customer value, so that the customers feel that we are the right choice of company for them.
If I look at other aspects where RFID really could be beneficial for us would be if we could get suppliers to also use RFID with which we could cooperate. Then we would be able to see instantaneously when goods arrived at our warehouse, which would cut down our lead times enormously. However this is nothing we have looked into too much yet, but there are some great possibilities.

9. Interviewer: Does your company utilize the usage of RFID technology in its marketing strategies?

Interviewee: We definitely market our use of RFID in our logistics process to our customers. Of course through our sales personnel, but also by having our key customers come to our central warehouse to see our logistics model, which is one of the key aspects in our sales model. Our good and reliable logistics model is a strong sales argument, why should you choose us, because we can guarantee that the right things get delivered on time, where it is supposed to.

10. Interviewer: Does RFID technology provide valuable information that can be used within marketing activities?

Interviewee: Yes, an important sales argument that we show our customers are our statistical numbers and low number or errors in our logistics process.

11. Interviewer: Does your company promote to its customers that you are using RFID? If so, in whatways?

Interviewee: As mentioned, we promote our use partly through our sales personnel, but also by showing our key customers around our central warehouse. Our warehouse is one of the biggest ones in Europe, and yearly we have 4000 visitors. A big part of the presentation we give our visitors is about our use of RFID and how it allows us to ensure that we can deliver on time at the right place.

12. Interviewer: How do your customers react towards that you are using RFID technology?

Interviewee: Based on my experience, the reaction towards RFID is mixed. Most people have heard about RFID, but there are still a lot of people that don’t know what it is good for or what exact function it has. Some people believe that if you have RFID
then you don’t need to have an EDI system, because they think that all information can be stored in the tag, and of course, this is true to some extent but not totally. It is also another way of scanning goods, where you don’t need to personally scan each and every code, but instead you have an automatic reader that can since where the goods are.

You need to find an implementation that is suited for the company and business. RFID has been in the industry for some time, but there are not a lot of companies that has implemented it. Probably because you have to find a situation where it is beneficial to implement it, and also that there has to be large enough volumes for RFID to be financially beneficial. I think there are some insecurity about RFID and its capabilities.

13. Interviewer: Have RFID technology contributed to an increase in perceived customer value? If so, in what ways?

Interviewee: You have to find a reason why to implement RFID, and of course customer value is one of those reasons. By us being able to guarantee that everything we send out to our customers has been sent out help us get closer to our goals and promises that we make to our customers of a 100% delivery guaranteed. This certainly increases our customer satisfaction and customer value. Then of course, things can still break maybe during transportation or so, but RFID helps us to minimize errors which we can influence. And then we always follow up with our customers if there is any error that has occurred or any deviant cases.

14. Interviewer: Have RFID technology in any way influenced your competitiveness?

Interviewee: Absolutely, by keeping down errors in our logistics process we can offer our customers better service and also as it keeps down our costs we can keep down the prices to the customer. The benefits that have arrived as a result from RFID are nothing that we charge our customers for, we just want it to improve our process as well as improve the value for the customer. This makes us more competitive. Neither us nor our competitors stand still in our development, and since we all offer similar things to the customer, it is very much about what added services and added value that you can offer your customers, which your competitors can’t.
15. Interviewer: Do you want to add any other information to this interview, about RFID, that you feel has not already been covered?

Interviewee: I think that a lot of people read about RFID, but it is not so common in practice yet. I think if there were more standards within the implementation and usage of RFID, and the tag could become a more stand alone thing, put more information on the tags, then maybe it would be possible to cut down the use of barcodes and other EDI systems. I think everyone is waiting for more standards, and no one wants to be the first one, it is often very costly to invent the wheel. I think our company is very far ahead when it comes to RFID. Normally it is customer demands and needs that make you implement a neat is not the case for us this time, but we hope that it will fulfill a customer demand in the future.