Means to capture value in e-commerce of groceries

A systematic approach to explore business opportunities for the food packaging and processing industry

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Means to capture value in e-commerce of groceries: A systematic approach to explore business opportunities for the food packaging and processing industry

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In collaboration with
Abstract
The grocery retailing has evolved over the past 60 years from small, local retailers to out-of-town hypermarkets and now the rise of e-commerce of groceries is reshaping the landscape.

This report seeks to understand how the growing field of e-commerce of groceries is affecting a processing & packaging solution provider like Tetra Pak and further identify business opportunities for Tetra Pak. The company has a unique role within the food industry in which they sell around 185 billion packages every year and they have been reshaping the food industry to where it has gotten today with the iconic package for milk and the subsequent introduction of aseptic technology that made it possible to sustain a longer shelf life for its products.

Further, to achieve the research objective, three goals were set up:

1. Identify the value chain for e-grocery and compare with traditional grocery
2. Identify implication e-grocery has on the packaging system
3. Present business opportunities based on the findings

The first goal was achieved by mapping out e-grocers value chain from a holistic point of view and with further analysis the two following goals could be answered.

The value chain for e-grocery is evidentially different from the traditional value chain in that they offer a service of picking and packing and then deliver safely to the consumer. Within that service e-grocers are facing a lot of challenges and inefficiencies including the high operational cost for their delivery model, conveying the trustworthiness of their service, providing flexibility in line with the consumers’ lifestyle and preference in regards of time-slots and delivery option. Further, technological trends and ventures indicate that e-grocery will advance in the future. Considering technologies such as Big Data, Internet of Things (IoT), Machine Learning and Augmented Reality, will lead to new opportunities both for e-grocers but also food producers.

The packaging system for e-grocery indicated that new requirements such as Portion/recipe sized package, isolating grocery bags/ primary packages that can handle the last-mile distribution are needed. Further, Tetra Pak’s package Tetra Brick Aseptic is found to be suitable for e-grocery however it should be tested in order to know exactly how good it is. The stakeholder involved have optimized towards the traditional value chain and seeing that the online grocery shopping is gaining a rapid growth there are both opportunities and challenges to take upon.

Keywords: E-grocery, processing & packaging company, e-commerce, groceries
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Sammanfattning

Dagligvaruhandeln har utvecklats under de senaste 60 åren från små, lokala återförsäljare till stormarknader utanför staden. Ökningen som sker utav e-handel av dagligvaror håller på att omforma landskapet för livsmedelförsäljning.

Denna rapport syftar till att förstå hur det växande området för e-handel med dagligvaror påverkar en process- och förpackningslösningsleverantör som Tetra Pak och ytterligare identifiera affärsmöjligheter för Tetra Pak. Företaget har en unik roll inom livsmedelsindustrin där de säljer runt 185 miljarder förpackningar per år och de har även omformat livsmedelsindustrin med den ikoniska paket Tetra Classic för mjölk samt den efterföljande aseptiska tekniken som gjorde det möjligt att upprätthålla en längre hållbarhet på färskvaror.

För att uppnå studiens syfte, sattes följande tre mål upp:

1. Identifiera värde kedjan för e-livsmedelshandel and jämför med den traditionella livsmedelshandeln.
2. Identifiera implikationer för förpacknings system
3. Presentera affärsmöjligheter baserad på resultaten

Det första målet uppnådddes genom att kartlägga värdekedjan för den digitala livsmedelshandeln från ett holistiskt perspektiv och med ytterligare analys kunde de följande två målen uppnås.


Nyckelord: Digital livsmedelsbutik, process- och förpackningsföretaget, e-handel, livsmedel
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Preface

About five years ago, we began our studies at Blekinge Institute of Technology (BTH). These five years of intensive study has culminated in a thesis, consisting of the research area e-commerce of groceries. This report in your hand represents the end of our engineering education and in many ways the beginning of our career. The supervisor at BTH was Doctor Martin Svensson and the thesis was conducted in collaboration with Tetra Pak, as part of a larger project in which e-commerce of groceries is explored.

We would like to take the opportunity to thank the people who have helped us and supported us throughout this journey. This project would not have been possible without our supervisor at Tetra Pak, Gustav Levander, who has truly been a mentor throughout the entire process. Thank you for giving us the opportunity to work with you and for the time that you have spent to guide us through every step. We would also want to thank the entire Front End Innovation department for the trust and support and a special thanks to Bengt Björck and Mats Emanuelsson for your wise words and support during this period, it has truly been a journey full of lessons.

Finally we want to thank each other for completing this thesis together and for always doing our best.

Karlskrona, juni 2016

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Jala Omar                                                                 Yasmin Pourmokhtar
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# Table of Contents

ABSTRACT .............................................................................................................................................. i
SUMMARY (SWEDISH) ......................................................................................................................... iii
PREFACE .................................................................................................................................................. v

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>TABLE OF CONTENTS</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Objectives</td>
<td>3</td>
</tr>
<tr>
<td>1.3 Thesis questions</td>
<td>4</td>
</tr>
<tr>
<td>1.4 Delimitations</td>
<td>4</td>
</tr>
<tr>
<td>2 THEORETICAL FRAMEWORK</td>
<td>5</td>
</tr>
<tr>
<td>2.1 E-commerce of Grocery</td>
<td>5</td>
</tr>
<tr>
<td>2.1.1 The Historical Downfall</td>
<td>5</td>
</tr>
<tr>
<td>2.1.2 The Customers</td>
<td>6</td>
</tr>
<tr>
<td>2.1.3 Manufacturers</td>
<td>7</td>
</tr>
<tr>
<td>2.1.4 E-grocers</td>
<td>7</td>
</tr>
<tr>
<td>2.2 Packaging Logistics and the product packaging system</td>
<td>9</td>
</tr>
<tr>
<td>2.2.1 Defining packaging logistics</td>
<td>9</td>
</tr>
<tr>
<td>2.2.2 The product packaging system and supply chains</td>
<td>9</td>
</tr>
<tr>
<td>2.3 Packaging Logistics and E-commerce</td>
<td>11</td>
</tr>
<tr>
<td>2.4 Foresight</td>
<td>13</td>
</tr>
<tr>
<td>2.5 Business models</td>
<td>14</td>
</tr>
<tr>
<td>3 COMPANY DESCRIPTION</td>
<td>18</td>
</tr>
<tr>
<td>4 METHOD</td>
<td>20</td>
</tr>
<tr>
<td>4.1 Research process</td>
<td>20</td>
</tr>
<tr>
<td>4.2 Research Design</td>
<td>22</td>
</tr>
<tr>
<td>4.3 Data collection</td>
<td>22</td>
</tr>
<tr>
<td>4.3.1 Interviews</td>
<td>23</td>
</tr>
</tbody>
</table>
4.3.2 Conference and summit observations 23
4.3.3 Study of archival documents and articles 24
4.3.4 Summary of data collection 24

4.4 Data analysis 25
4.4.1 Qualitative data analysis 25
4.4.2 Coding 25
4.4.3 Summary of data analysis 26

4.5 Validity and Reliability 27

5 EMPIRICAL FINDINGS 29

5.1 Comparison between traditional and online 29
5.1.1 The Value Chain for traditional grocery 29
5.1.2 The Value Chain for e-grocery 32
5.1.3 Differences between traditional and online grocery retailing 39

5.2 Challenges faced by e-grocers 41
5.2.1 Quality 41
5.2.2 Flexibility 43
5.2.3 Collaborations 44

5.3 Packaging System for E-grocery 47
5.3.1 Primary Packaging 47
5.3.2 Secondary Packaging 48
5.3.3 Tertiary Packaging 50

5.4 Technological Trends 50
5.4.1 Internet of things (IoT) 51
5.4.2 Big data 51
5.4.3 Augmented reality 52
5.4.4 Autonomous car 52
5.4.5 Virtual reality 53
5.4.6 Machine learning 53
5.4.7 Ventures 54

6 ANALYSIS 58

6.1 Implications on the processing and packaging industry 58
6.2 Packaging decisions for Tetra Pak 61
6.3 Business Opportunities and Recommendations for Tetra Pak 65
APPENDIX A: INTERVIEW SUMMARY
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1 INTRODUCTION

In the introduction the authors will explain the relevance of this research for both academia and Tetra Pak. The background, objectives, delimitations and thesis questions will put the base for the rest of this report.

1.1 Introduction

The Internet represents a global revolution in which e-commerce was one of the most important features that emerged and created a marketplace for companies to sell their products and services (Bodini & Zanoli, 2011). Moreover, consumers are provided with substantial information at their disposal before purchasing anything. They are becoming ever more technologically savvy, smarter and increasingly connected to the Internet, leading to an increase of consumer power. This further leads to a higher pace of changing needs among the consumers (Datamonitor Consumer, 2012). Moreover, retailing undergoes disruption every 50 years or so (Rigby, 2011) and now the demand for e-commerce of groceries is increasing, thus leading to retailers responding accordingly (Nielsen, 2015).

The grocery retailing has evolved over the last 60 years from small, local retailers to out-of-town hypermarkets and it is stated that over 50% of the customers have gone over to the new dominant format (Ocado Group, 2016). Each wave of change, even though not eliminating what came before, reshapes the landscape and the consumer expectations are redefined (Rigby, 2011). The growing field of e-commerce of groceries is providing retailers with an entirely new business and revenue model in an already established mature industry. Further, e-commerce of groceries has been around for decades and the attempts to sell groceries online have not succeeded in the past. The e-commerce crash that happened in the beginning of 21th century was not something unique, rather a natural step towards its development. The reason behind the fall of e-commerce at that time was due to underestimating the competition from established companies and operating a viable logistic. Furthermore, it was clear that there was a lack of understanding of consumer needs in a sufficient way (Johnsson & Jönson, 2006).

The grocery industry is one of the largest segments in global industry (Syndy, 2015). Even though, the influence of online grocery is not equally as strong compared to other online retail sectors it still represents the fastest growing retail sector in e-commerce. There are strong incentives that the online food retail is going to expand further due to the increasing number of grocery retailers entering the market, especially the established food chains that are investing heavily on marketing and expanding to various regions. Moreover, time scarcity, already digital active consumer is one of the drivers that reduces the barrier to shop food online (Digital Mathandel, 2016).

In Sweden online grocery sales grew by 39% in 2015, which accounts to 4.1 billion SEK. According to Digital Mathandel (2016), the online grocery sales is estimated to increase by 38% in 2016, accounting to 5,7 billion SEK and equals 1,9% of the total grocery sales. Over the last two years the online grocery market has grown with a doubling pace and from 2009 and up until 2015 e-commerce of groceries grew from 0,6 billion SEK to 4,1 billion SEK, leading to outpacing the industry as a whole.

The UK market is also showing a strong growth in which the total online grocery market grew by 12,5% in 2015 accounting to £8.6 billion. Even though the store-based grocery retailers
remain dominate, with its 73.7% of all online grocery sales in 2015, Ocado being a pure online retailer is outpacing the wider market. The main driver for the consumers in the UK is convenience with online shopping. Other drivers for buying groceries online are delivery slots, speed of delivery and click-and-collect points that is encouraging an increase of online grocery shopping, in which retailers have improved in recent years (Mintel, 2016). Table 1.1 represents the total amount of sales in e-commerce of groceries for different countries and it shows that the maturity of online retailing is different for different parts of the world. UK has the highest e-commerce market share in Europe due to consumers being more open to implement new solutions and more prone to try new things (Digital Mathandel, 2016).

![Table 1.1: The total sales of e-commerce of groceries (2014), (* Swedish sales refer to 2015)
Source: Kantar Worldpanel and HIU Research (Sweden)](image)

The growth rate in online sales leads to actors upstream in the value chain needing to take into account of the consequences of online retail. One of the likely consequences of e-commerce is a changing demand for manufacturers (Rabobank, 2015) and furthermore today’s retail value chain are optimized for stores, with online often treated as a separate business, which leads to poor cross channel coordination across channel specific inventory pools and fulfillment processes (Chaturvedi et al. 2013).

Tetra Pak is the world’s leading company in food processing and packaging solutions, selling 180 billion products every year. They pose a unique role within the industry, where their value proposition includes not only package solutions but also processing, filling and distribution solutions. Their vision is to make food safe and available everywhere, which is reflected in their motto, “Protects What’s Good”. Moreover, Tetra Pak unlocked the modern food and drink industry and opened a wide range of opportunities, simply by introducing the iconic package for milk and the subsequent introduction, in the 1960s, of aseptic technology that made it possible to sustain a longer shelf life for its products (Harvard Business Review, 2014).

Tetra Pak adapts based on customers’ needs, consumers’ needs, and helps their customers to meet the shifting demands of a rapidly changing market dynamics. In order to response to the emerging needs on the market, Tetra Pak invests in technology and new products in order to respond to those emerging needs. For example, Tetra Pak acknowledged that at current trend is so called on-the-go consumption and developed portion pack formats such as Tetra Prisma® Aseptic to meet this trend, thus leading to selling 100 billion of their products in on-the-go formats (Harvard Business Review, 2014).
The advent of online grocery shopping has fundamentally impacted the consumer landscape and will continue to do so. The possibility to order groceries online has not only addressed the needs for convenience and choice but has also created new needs due to higher expectations from consumers for example demanding higher availability for time slots (Datamonitor Consumer, 2012). But the presence of online retailing does not only have implication on consumer needs, it is stated in Rabobank report (2014) that it “will lead to fundamental changes along the supply chain, from processor through to retailers” (Rabobank, 2014, p. 1). Moreover it is stated that online retailing will be a game changer for processors meaning that they need “to asses brand strategies, adjust and diversify their product range, refine their marketing tactics and modify their supply chains in order to meet the demands of online retailers” (Rabobank, 2014).

Furthermore, the packaging technology has played a fundamental role in the grocery retailing sector, it has catered to the needs and wants of the consumer, creating new disruptive channels, enabling lower costs, enhanced product differentiation, better quality of presentation, to name a few (Coles, McDowell & Kirwan, 2003). E-commerce of groceries is providing an improved flow control, resulting in fresher products for consumers, shorter lead times and smaller batches made possible due to better data and forecasting (Rabobank, 2014). Moreover, there is a lot of talk about the so-called “the last mile” which refers to the delivery of groceries to the consumer. Retailers have had difficulties to create a viable solution in order to accommodate the last mile and various solutions are launched to provide wider slot windows for the consumers but also to secure the freshness of the products during the delivery, which “remains the biggest challenge in grocery delivery” (Syndy, 2015, p. 3).

The growth of e-commerce of groceries will inevitably lead to a new set of challenges emerging but also opportunities that will affect the supply chain. Tetra Pak who are highly involved in the value chain will need to address these changes, either to adapt with its packaging and processing solutions or become innovative and improve the flow of the new online grocery retailing. This research will therefore focus on identifying new business opportunities for Tetra Pak. The value chain for the grocery retail stores are partly shaped by the fact that packaging allows products to be stored in shelves and distributed longer distances and is now changing due to e-commerce. This study will provide with a better insight of how the new landscape of online grocery retailing is affecting the value chain, as well as how this will affect and what challenges they need to address. Moreover, as Nonaka (2008, p. 8) argues: “In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. When markets shift, technologies proliferate, competitors multiply, and products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products.”

1.2 Objectives

The overall objective of this study is to discover means to capture value in the growing field of e-commerce of groceries. Moreover, the aim of this research seeks to understand the implications e-commerce of groceries will have on the value chain. These findings that are presented can be an input for strategic insight for actors involved in the value chain. Furthermore, the study will provide with recommendations on how Tetra Pak should prepare for the future and capitalize in the market and identify business opportunities in the growing field of e-commerce of groceries.
1.3 Thesis questions

This study involves three separate analyses; e-grocery retailing, offline grocery retailing and trend insight in regards to the grocery retailing industry. These separate analyses will then be compared in a holistic manner in order to unveil general gaps and future business opportunities. The study is therefore broken down into three questions, which are the following.

1) What are the differences in the value chain between the traditional and online grocery retailing?
2) What implications does e-commerce of groceries have on the packaging system?
3) What are the business opportunities in e-commerce of groceries for processing and packaging industry?

1.4 Delimitations

The entire supply chain will be examined to understand relations and value streams between different stakeholders that are involved. However, this study will emphasize the online retailers’ value chain and its relation with the stakeholders involved. E-commerce of groceries in this study represents the business-to-consumer (B2C) e-commerce and not other types i.e. B2B, C2C, and C2B e-commerce due to the fact that e-commerce of groceries is targeted towards end-consumers. The focus will solely be on online retailers that offer their full assortment online since we want to compare the data to conventional stores where full assortments are offered. Furthermore, the full assortment will give a widespread picture and knowledge of how the distribution, marketing, logistics aspects are affecting the supply chain from the perspective of the retailer.

The data collection will be limited to Sweden and the UK, the reason being that the thesis is written in Sweden and major online actors can be accessed for interviews, and that the UK market is of interest for trend watching due to its size and maturity compared to the rest of the world.
2 THEORETICAL FRAMEWORK

E-commerce of grocery is first described based on previous research in that specific area, online grocery retailing, meaning that articles that are treating e-commerce of other product categories are have not been considered. The section has been divided into subsections based on the articles that were found. The following section describes packaging systems which is also described in relation to e-commerce; this is to create a framework to understand the role of a packaging and processing company in e-commerce of grocery. Foresight concept is described since that is used during the exploration of future opportunities for e-commerce of groceries. Finally business model theory is required for the final steps of this research when business opportunities for the company are elaborated and discussed.

2.1 E-commerce of Grocery

Research focusing exclusively on e-grocery has been occasionally conducted over the years (Ramachandran et al., 2011). The so called milkman who delivered milk to the homes of consumers, and fast food deliveries are niche markets that has existed a long time with home deliveries. However there are unexplored opportunities to revolutionize the grocery industry, and investments in online operations from large retailers such as Tesco, Sainsbury’s and newcomers like Ocado shows that the market is increasingly becoming aware of the potentials (Ramachandra et al., 2011). As Anesbury et al. (2015) put it; “Multichannel retailing is now the norm, with online being heralded as the fastest-growing distribution channel”. Anesbury et al. (2015) elaborates further and states that the use of Internet to buy goods and services varies across geographies, categories, and so on but the overall trend is that consumers are increasingly buying more online.

2.1.1 The Historical Downfall

Although e-grocery is growing rapidly it is not a new concept. Already back in the 90s companies in the USA (e.g. Webvan and Streamline) were developed as pure players and in the UK supermarkets (e.g. Tesco) started e-grocery operations (Transkanen et al., 2002). Webvan and Streamline, amongst others, failed to break even before running out of money. In short you can say that people did not see the benefits of ordering groceries online since it still was difficult to use computers and consumers were not familiar with the Internet it took time to learn the new buying routines before any time savings took place and the technology was not developed to make the ordering process convenient, and IT systems for route planning was not developed, which made it difficult to make deliveries efficient when the quantity of orders increased. Transkanen et al. (2002) explains the struggle for e-grocers is because of low buying power in relation to the suppliers, which in turn is gained when there are large sales volumes, which requires a lot of new customers, and new customers are attracted by good prices and a wide range, which is something you can get with buying power. This can be illustrated as a vicious cycle, one thing is affected or required by the other, see figure 2.1. So e-grocers could not afford to offer attractive prices and a wide range, and this made it impossible to gain more customers, which was the requirement to sell larger volumes and gain more power.
Murphy (2003) concludes in his case study that the problem of e-grocery is of time and space; the design of brick-and-clicks are not suitable for e-commerce picking and packing, while the difficulties in outbound logistics are that low densities of orders leads to high costs of deliveries, while high density lead to complex route planning. The higher flexibility for the customers the higher distribution costs (Murphy, 2003). Murphy (2003) also means that a higher turnover leads to a better range and freshness in products, and raises the problem to scale operations when demand increases. In 2003 Geuens et al. (2003) listed three obstacles for online retailing to become a success; Firstly secure payment and trust, secondly fulfilment problems (expensive logistics and delivery), and thirdly technological problems. Enders and Jelassi (2009) also list three reasons for the lack of success for e-grocers; (1) customers want to sample the groceries (especially fresh vegetables, fruits and meats) themselves which is not possible when shopping online, (2) high distribution costs; due to bulky volumes and the nature of perishable products, and (3) grocery retailing is a low margin industry with severe costs. The downfall of the e-commerce of groceries in the 21th century seems as a distant memory and a new wave of online grocery retailers is emerging. The technology has advanced, digitalization is imbedded into the consumer’s lifestyles, and retailers are more aware of the challenges.

### 2.1.2 The Customers

Ramus and Nielsen’s (2005) study shows that in the minds of consumers e-grocery shopping is preferred over shopping in physical stores in terms of convenience, product range and price, on the other hand the disadvantages are the risk of receiving products with poor quality, and loosing the amusing part of grocery shopping. However it is stated that the quality of fresh products are higher from e-grocers since the items haven’t been touched as many times as if it would when go through a conventional supply chain (Transkanen et al., 2002). So it could be seen as a matter of proving that the quality is higher ordering online and earning the consumer’s trust. The reasons for consumers to start shopping online according to Hand et al. (2009) are situational factors and life events, for example having a baby or getting health problems. Reasons to stop shopping online can be that the factors disappear, or that the consumer gets a negative and frustrating shopping experience online (Hand et al., 2009). Melis et al. (2015) show that consumers at first, when they begin to shop online, usually select e-grocers based on their choices of offline retailers, which could be because they are not as familiar with the online shopping environment as they are with the offline according to Dawes and Nenycz-Thiel (2014). When omni-channel retailers (brick and clicks) have a strong integration in the marketing mix between the online and
offline store the probability is higher that consumers choose to shop from the same retailer online as offline (Melis et al., 2015). However as consumers gain online experience the effect of offline on online store choice will decrease and as the confidence increases the focus will shift to a comparison between different online retailers (Melis et al., 2015).

Delivery charge is not the most important factor affecting consumers preference when choosing between online or offline grocery shopping, it is concluded that time savings gained by shopping online have a greater impact than a lower delivery charge (Huang and Oppewal, 2006). Online and offline shoppers put different weightings on influential factors, both types of shoppers put ordering time and quality first, however offline shoppers put more weight on these factors than online shoppers (Wilson-Jeanselme and Reynolds, 2006), therefore it is suggested that retailers ensure that a first time shopper get a fast and easy experience and best quality items to increase customer acquisition. It has also been found that consumers are more brand and size loyal but less price sensitive online than offline, and that light online consumers show the highest brand and size loyalties and lowest price sensitivity, while heavy online shoppers are the other way around, more price sensitive and less brand and size loyal (Chu et al., 2010).

Shopping online is not a linear process according to De Kervenoael et al. (2014); they mean that a disjointed approach is carried out when shopping groceries online. Because of all the features and activities that are available online, shoppers tend to switch between shopping, social media, evaluations, searching and so on; therefore one can say that there is a reorganization of time instead of time-saving when shopping online. The ethnographic research by de Kervenoael et al. (2014) implies that “technology-mediated interaction is creating new types of fragmented shopper behaviours” (p. 161). People have the opportunity to choose the channel that suits their lifestyle in that particular point in time. Shoppers can, as mentioned, get hold of information about products and grocery stores from various sources, which make it even more important for retailers and manufacturers to understand the socio-cultural consumer as well as the technology-mediated experience (Kervenoael et al., 2014).

2.1.3 Manufacturers
The success of self-service supermarkets came when manufacturers started to package the grocery products (e.g. bread, milk, cereals, washing, and washing detergents) and changed the packages to fit into the store’s structure and shelves, which made identification and handling easier for consumers (Transkanen et al., 2002). Requirements on identification and handling will still be an issue for manufacturers even though they are different in e-commerce. The results from a study of online consumer behaviours conducted by Anesbury et al. (2015) shows that a first-page position is valuable for brand managers since shoppers tend to only view a few online pages of brands before choosing a product from a category. Furthermore consumers usually pick brands that are familiar to them and they do not conduct an extensive search or inspection.

2.1.4 E-grocers
A study by Saskia et al. (2016) shows that the focus of e-grocers is at the moment on empowering customers’ loyalty and gaining market share rather than gaining economic growth. The logistics and transportation issues are still the biggest challenge for e-grocers; they need to get the groceries to consumers in a time and money efficient way, thus home deliveries and the last mile problematic challenging aspects of e-grocery and according to Saskia et al. (2016) storage and transportations (logistics) will decide the future of e-grocery. Hübner et al. (2016) have developed a strategic planning framework, which is for the last mile (order fulfilment and distribution), although the design of an e-grocer depends on country, customer, and specifics for
the retailers, the framework can be used as an overview of fulfilment opportunities and alternative configurations (see figure 2.2.)

![Diagram](image)

**Figure 2.2: A strategic planning framework for last mile order fulfilment and delivery (Hübner et al., 2016, p. 234).**

In online groceries sales the “warehouse” is referred to back-end fulfilment, meaning that the e-grocers offer a service in which they pick & pack to fulfil the consumer order. Fulfilment centres are differently configured depending on the e-grocers business model. For example brick & clicks usually either pick & pack orders in dark stores or in the retail store, while pure online e-grocers have most commonly have dedicated customer fulfilment centres. The back-end fulfilment shows that the picking can take place in different locations, with different levels of automation and integration. Furthermore the last mile distribution displays that various delivery modes, delivery times and delivery areas, and lastly returns can unfold differently. Furthermore Saskia et al. (2016) state that there are three changes in the supply chains for e-grocers: involvement of new actors, new relationships to actors, and new supply methods.

**Preliminary Summary**

Based on previous studies made in the area of e-commerce of groceries it is clear that the main topics are about technological advancement, logistics, and customer behaviour. Historically all these topics have caused e-grocers to fail; technology has not been advanced enough, the complex logistics for fulfilments and deliveries could not be handled efficiently, and consumers were not ready neither mentally (lack of trust) nor technically (lack of computer skills). However most of the obstacles are being overcome by e-grocers nowadays, logically because technology has advanced and consumers are more familiar with the online sales channel. The main focus of e-grocers currently is to gain market share and customer loyalty, and it is stated that storage and transportations will decide the future of e-grocery. The strategic planning framework for back-end fulfilment and last mile shows areas of the value chain that are important to plan and these are the areas that are further studied in this qualitative research. Also, the ordering phase where consumers have to interact with the website and face online marketing is further elaborated in the research.
2.2 Packaging Logistics and the product packaging system

2.2.1 Defining packaging logistics
A package can be seen as the interface between the product and the consumer (Olsson & Larsson, 2009). Consumers’ perception of products is influenced by the packaging and its promotion through textual and graphical communication of the content (Venter et al., 2011). Packaging logistics has been defined as “the process of planning implementing and controlling the coordinated packaging system of preparing goods for safe, efficient and effective handling, transport, distribution, storage, retailing, consumption and recovery, reuse or disposal and related information combined with maximizing consumer value, sales and hence profit.” (Saghir, 2002, p. 45), and it stresses a broad system perspective where different aspects (e.g. product development, logistics, etc.) are addressed and managed with emphasis on figuring the role of the packaging within the product life cycle and supply chain (Saghir, 2004).

The main definition of logistics used in packaging logistics is according to Lindh (2016) the one by the Council of Supply Chain Management Professionals’: “The process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption for the purpose of confirming to customer requirements. This definition includes inbound, outbound, internal and external movements” (CSCMP, 2013). A simplified schematic model of a supply chain for a generic packaged food product that is distributed through retailing is illustrated by Lindh (2016) as in figure 2.3. These types of models are often used in packaging logistics research to describe a PPS’s journey from raw material to use (Lindh, 2016).

Figure 2.3: Schematic model of a supply chain for a generic packaged food product distributed through retail (Lindh, 2016).

2.2.2 The product packaging system and supply chains
The product packaging system, meaning the primary, secondary and tertiary packages and accessories, is a critical factor in the supply chain since all products are contained in packages when moving from supplier to the manufacturer, distributor, retailer, and in the end the consumer (Regattieri & Santarelli, 2013). The packages that come in direct contact with the product are called primary packages (Krochta, 2007), this is the level that consumers usually see as the packaging. The secondary packages are often referred to as retail packaging and are usually used for clustering primary packages and facilitate the handling of packages in retail (Hellström & Saghir, 2007; Krochta, 2007). Tertiary packaging consists of pallets, shrink-wraps, and rolls containers, and is also called “transport packaging” (Hellström, 2007; Hellström & Saghir, 2007). The tertiary packaging is important for the ability to transport many products...
simultaneously (Krochta, 2007). The product packaging system (PPS) is based on a systems approach that highlights the interdependence between three levels of the packaging system and furthermore with the product (Sohrabpour, 2014). According to Hellström and Saghir (2007) the package and the product should be regarded as a unified entity throughout the lifecycle; from the filling until consumption. Researchers argue that the PPS perspective is important due to the fact that changes in one level will impact the others (Olsson & Larsson, 2009; Pålsson et al., 2013).

The design of packaging can affect the performance of each actor in the supply chain and it has the potential to influence the efficiency and effectiveness of the actors as the product is moving through the supply chain (Simms & Trott, 2010). However different packaging levels are concerned by different actors, as illustrated by Hellström (2007) in table 2.1.

Table 2.1: The interacting packaging levels in the retail supply chain (Hellström, 2007).

Thus, all actors have their own demands on the PPS (Hellström & Saghir, 2007; Simms & Trott, 2010) and to access, balance and transform these different demands into smart packaging solutions is a success factor in packaging development (Rundh, 2009). Packaging demands can be translated into functions and features that will meet the demand and create values for actors in the supply chain, the value creation of a PPS can be seen as the value created by the content, the prerequisites for services and the physical package (Lindh, 2016).

Hellström and Saghir (2007) demonstrate that mapping the connection between logistics processes and the physical packaging flow can help to understand the value-adding of packaging, and thereby help to advance the efficiency and effectiveness of retail supply chains. The authors also suggest that a more complete description requires a holistic packaging approach where the processes of end-consumers also are included, i.e. marketing functions, to make sure that conflicting trade-offs are considered in the packaging decisions.
The inter-dependability of packaging and logistics decisions are illustrated by Hellström and Saghir (2007) in figure 1. The loop shows that packaging decisions are influenced by logistics decisions and the other way around.

![Diagram](image)

**Figure 2.4:** The cause-affect loop of packaging and logistics decisions (Hellström & Saghir, 2007).

Furthermore investigating packaging innovation from a supply chain perspective, while taking the whole packaging system into consideration, can realise unexplored potential for competitive advantage and customer satisfaction (Hellström & Nilsson, 2011). A dynamic system perspective is required in order to create packaging innovations, and by considering the interacting systems; packaging, logistics, market and environment new business opportunities can be found (Hellström & Nilsson, 2011). Research on packaging design show that increased e-commerce and home-delivery services are some of the drivers that have shaped the packaging industry to be characterized by continuously growing innovation and development (Azzi et al, 2012).

**Preliminary Summary**

Using a product packaging system perspective is beneficial when looking for unexplored packaging needs and potential opportunities for innovation. Studying the interacting system levels and supply chains can potentially reveal new packaging demand that can later on be translated into functions and design attributes. Packaging logistics theory and the PPS framework will be used to connect packaging with e-commerce, it will also help to analyse the e-grocery implications on a packaging and processing company.

**2.3 Packaging Logistics and E-commerce**

The importance of the packaging system is growing due to the development of e-commerce and that the role of packaging will be less about the traditional shelf presentation and become more about information and containment of products (Regattieri Santarelli, 2013). More attention is preferably given to the consumer’s perception of a brand during usage rather than the shelf presentation (Visser, 2002).
E-commerce or online shopping have an effect on the interaction between packaging and industrial functions from a marketing, logistics and environment point of view, different issues found in a research by Regattieri & Santarelli (2013) are listed in the table 2.2. The authors compare issues in “real shop” with “online shop”, real shops meaning traditional grocery stores “offline” and online shops meaning e-grocery stores.

<table>
<thead>
<tr>
<th></th>
<th>Real shop</th>
<th>Online shop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>Sell, differentiate, promote, value, inform, shelf presentation, visual communication</td>
<td>Brand identity, means of disseminating information, product promotion</td>
</tr>
<tr>
<td>Logistics</td>
<td>Handle, transport, store, distribute</td>
<td>Protection and covering the products, transport, reverse logistics, security</td>
</tr>
<tr>
<td>Environment</td>
<td>Reduction of materials used, re-use, recover, disposal</td>
<td>Reduction of materials, recyclable materials, re-use, disposal</td>
</tr>
</tbody>
</table>

*Table 2.2 Packaging and industrial issues in real and online shops (Regattieri & Santarelli, 2013)*

Packaging for marketing purpose is traditionally about selling products, differentiating, promoting, adding value, information, shelf presentation and visual communication. For e-grocers the marketing has become more about brand identity, means to spread information and promote products. Logistics has gone from handling, transporting, storing and distributing to more focus on protection and covering products, transportations, performing reverse logistics and security. The issues concerning the environment have not changed much, however more recyclable materials are required.

It is found that e-commerce does require a new paradigm for the product packaging system (Regattieri et al., 2014). Regattieri et al. (2014) have explained packaging for e-commerce based on three pillars; design, logistics and environment. The authors introduce a framework for packaging in e-commerce presented in table 2.3. The framework is meant for companies that decide to start an e-commerce business and it shows how three pillars; design, logistics and environment, have different characteristics in e-commerce. The pillars and characteristics are meant to be used for analysing the packaging system design for e-commerce.

<table>
<thead>
<tr>
<th>Design:</th>
<th>Logistics:</th>
<th>Environment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>Order management</td>
<td>Pollution</td>
</tr>
<tr>
<td>Volume</td>
<td>Management of the warehouse</td>
<td>Reduction of packaging waste</td>
</tr>
<tr>
<td>Weight</td>
<td>Lead time</td>
<td>Bio-degradability</td>
</tr>
<tr>
<td>Materials</td>
<td>Shipment</td>
<td>Recycling</td>
</tr>
<tr>
<td>Accessories</td>
<td>Traceability</td>
<td>Re-use</td>
</tr>
<tr>
<td>Protection and containment</td>
<td>Protection against in-transit Theft Reverse logistics</td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handle-ability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2.3 Framework for packaging in e-commerce based on three pillars (Regattieri et al. 2014)*
The development of online packaging should also take into account the ability to attract consumers and gain their curiosity (Regattieri et al, 2014). Online packaging has to be modified in different ways, such as functions that are communicative and informative to assist the consumers in identification of the products by reinforcing brand identity, and helping consumers in their decision making online (Regattieri & Santarelli, 2013). Packaging plays a central role in marketing, sales, and distribution of products and its potential for innovation is especially interesting from a supply chain perspective since packaging has such a basic role and function throughout the supply chain (Olander-Roese & Nilsson, 2009). Packaging has multiple functions; it is a device for protection during the distribution and also an important tool in the marketing mix, since innovative packaging design can bring benefits for consumers as well as producers (Rundh, 2005).

Preliminary summary
The main differences between the offline and online sales channel are about marketing and logistics. In marketing the online brand recognition and information becomes takes the role of shelf presentation, and in logistics protection and security are the main concerns. Furthermore the framework for packaging in e-commerce raises interesting point about requirements on design, logistics, and environment, however these pillars are for e-commerce in general and not specifically for e-grocery. The pillars can be used as a way of triangulating the findings from the empirical study.

2.4 Foresight
Foresight has been relatively difficult to define but in contrast to traditional forecasting, which more so fail to predict the future in turbulent times, it provides with a platform where it is possible to develop the science of the future. Magruk (2015) points out R. Slaughters definition of foresight as being “a universal human ability that allows thinking ahead, to model, create and respond to eventualities in the future”. Furthermore, foresight is providing organizations (i.e. companies, regions, etc.) to see into the future with new eyes and fully understand the implications of technological/societal paths. Moreover, it aims to “systematically exploring, predicting and/or explaining future developments with the means of different methods and techniques”. Thus, leading to adapt or renew its organization accordingly (Duin et al, 2014). With the rate of technological and other changes, it is even more so critical to know how these changes are impacting the business environment (Haridimos & Shepherd, 2009).

According to Voros (2003), foresight is an aspect of strategic thinking in organizational context, i.e. exploring options whereas strategy development is about setting directions and decision making, and lastly strategic planning is about implementing actions. Foresight is therefore seen as a direction for strategic planning through input into strategic making (Voros, 2003). The literature does not provide with simple rules to follow for choosing suitable methods and ultimately it can complicate the creation of optimal workflow. The process of selecting methods that suits the research is rather a complex process and often times based on intuition. Moreover, there is no single best method to be chosen, it all depends on the function and context of the study and to let the method dominate over the research is harmful (Magruk, 2015). Furthermore, the process of foresight starts with data collection, meaning related information available from various sources acts as a standpoint for further future analysis (Horton, 1999).

Foresight is a methodology that can act as a framework for the research design, leading to answering the research questions. It can act as a guideline of the data that is required to yield and
in what order to proceed with the research. Magruk (2015) brings up three research context, including technological, social and cognitive research. Methods related to technology have its function to identify key technologies, technology trends, observation and analysis of new technologies etc. Methods related to social context includes amongst other, examining the structure of social change, monitor social needs and investigate how factors will affect social development, thus affecting the social networking. The cognitive context refers to restorative and creative process and the main purpose is to understand and answer questions related to management of technology (Magruk, 2015). Within the three contexts, Magruk (2015) presents ten classes of innovation depending on the context of the study research. For this study methods within the innovation classes strategic and analytical has been considered but as Magruk (2015) points out to the fact that methods in each class could act as a substitute for another class depending on the research process (Magruk, 2015). Moreover, according to Haridimos & Shepherd (2009), it is important to be aware of the fact that foresight is not about predicting when new technologies will arrive rather it is about what implication they will have and their ability to offer new products/services, meaning that foresight is not a recipe nor specific forecast provider (Haridimos & Shepherd, 2009). By implementing foresight methodology, it will yield an understanding of the implication certain trends might have on the business environment and act as an input data to study future developments.

**Preliminary summary**

The foresight theory will be used for the analysis of technologies, the purpose is to understand how certain trends are affecting the e-commerce business environment and moreover find interesting viewpoints for analysis and strategic business model opportunities for a packaging and processing company.

### 2.5 Business models

Since the mid nineties the notion of business models have been commonly addressed in peer reviewed articles but there is not yet a common and broadly accepted language for the examinations (Zott et al., 2011). However there are four common themes amongst researcher:

1) Business models are a new unit of analysis;
2) Business models explains how firms do business through a holistic system-level approach;
3) The conceptualizations of business models have been influenced the activities of the focal firm and its partners;
4) And business models search explanations for both value creation and value capture (Zott et al., 2011).

DaSilva and Trkman (2014) have defined the core of business models as “a combination of resources which through transactions generate value for the company and its customers” (p. 383). A business model is employed by all established firms, and it describes how value is created, delivered and captured (Osterwalder & Pigneur, 2009). “A business model articulates the logic, the data, and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value” (Tecce, 2010 p. 179). The need to know how to capture value from new products and services has increasingly become more important in our new customer centric environment (Tecce, 2010). The business model concept offers a new way of analysing options in an uncertain and fast moving environment (McGrath, 2010). Business model design is as important as the product innovation when firms are aiming for profitable innovations; where business design options, customer needs

14
and technological trajectories have to be understood (Tecee, 2010). It is a useful tool to figure out a strategy with its dynamic perspective on the firm in action (McGrath, 2010). Many scholars have criticized and questioned the term business model due to its ambiguity, for example Porter who described it as a confusing term leading to faulty thinking amongst managers (DaSilva & Trkman, 2014). However the business model concept is relevant when it is about finding business opportunities in a holistic matter and less about managing a business.

The business model design process is usually iterative and very much situational (Tecee, 2010). It takes time for marketplaces to discover the most efficient business models, thereof experimentation is needed (McGrath, 2010). Experimentations are also supported by DaSilva and Trkman (2014) who state that the business model cannot become successful purely based on speculations and untested assumptions. Tece (2010) argues that having differentiated and hard-to-imitate business model architecture is crucial for establishing competitive advantage, but he also adds that business models often become “shared” by multiple competitors when it is successful (Tecee, 2010). It is difficult to plan analytically for which new BM that will displace an old one, since many variables are unknown, hence McGrath (2010) suggest experimentation to discover new BM’s. Moreover it is necessary to do strategy analysis coupled with business model analysis in order to protect the competitive advantage of a new business model implementation (Tecee, 2010).

A business model constitutes of two components; the “unit of business” and the process or operational advantages, the unit of business is what customers will pay for, and the second is what business architecture will yield superior performance (McGrath, 2010). When comparing units of business to one another as part of a strategic analysis, or analysing key metrics for performance assessment, one does not need an in-depth understanding of the resources and capabilities in the firm (McGrath, 2010). Demil and Lecocq (2010) have described a three core components in the RCOV framework (see table 2.4), they mean that a few general core components make it possible to measure changes across firms but at the same time have the flexibility to match the business model components to different organizations, since core elements can differ between them. The Business Model Canvas (BMC) can be used as a tool to test future conditions and if the business is set to handle future scenarios. The BMC is a snapshot in time, and foresight is a good framework to look at how the future might look (Osterwalder & Pigneur, 2009). The BMC is usually used as a tool to describe and discover new possible business models. With the same theme of discovering new opportunities Johnson et al. (2008) present a roadmap consisting of three steps for companies that want to create a new business model; (1) find opportunities to satisfy customers who needs a job done, (2) create a blueprint that describes how the company will fulfil that need at a profit, and (3) compare the new model with the existing model to see how much that can be kept and changed to capture the opportunity. The third step will allow the company to investigate if there are parts of the existing business model that has to be changed or if a separate organizational unit needs to be developed for the new model. The authors define a business model with four elements that are interrelated and will create and deliver value together; Customer value proposition (CVP), Profit formula, Key resources and Key processes (Johnson et al., 2008).

<table>
<thead>
<tr>
<th>Definition</th>
<th>Components</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>“…two core components of what constitutes a business model” (McGrath, 2019, p.249)</td>
<td>“Unit of business” Process or operational advantages</td>
<td>McGrath (2010)</td>
</tr>
</tbody>
</table>
elaborating on the Penrosian firm view, we assume that a BM can be described with three core components…”

<table>
<thead>
<tr>
<th>Business Model Canvas: A concept which describes the business model of an organization, it can be used as a blueprint for a strategy, and it consist of nine building blocks that are representing four areas of a business; the customers, offers, infrastructure, and financial viability.</th>
<th>Organizational Structure</th>
<th>Value Proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Proposition</td>
<td>Customer Segment</td>
<td>Osterwalder &amp; Pigneur (2009)</td>
</tr>
<tr>
<td>Customer Relationship</td>
<td>Channels</td>
<td></td>
</tr>
<tr>
<td>Key Partnerships</td>
<td>Key Resources</td>
<td></td>
</tr>
<tr>
<td>Key Activities</td>
<td>Cost Structure</td>
<td></td>
</tr>
<tr>
<td>Revenue Stream</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reinventing your business model: “…four interlocking elements that, taken together, create and deliver value”.</th>
<th>Customer Value Proposition</th>
<th>Johnson et al. (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Value Proposition</td>
<td>Profit Formula</td>
<td></td>
</tr>
<tr>
<td>Key Resources</td>
<td>Key Processes</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2.4: Ways of defining components of a business model.**

The BM should evolve over time to be able to handle different scenarios since the business exists in a larger system and recognition of how the system responds in time is needed to understand the business model not only now but also in the future. Established companies such as Apple, did not just take a good technology and designed it in an attractive way, what they did was far beyond design; they wrapped the good technology in a successful business model. With software (Itunes), hardware (Ipod) and the service (easy and convenient) they built a groundbreaking business model. Entire industries can be changed and reshaped through business model innovations; however it is very rare for well-established firms to do a business model innovation, only 10% of innovation investments are focused on the development of business model innovation at global companies (Johnson et al., 2008).

The business model components according to Johnson et al. (2008) can be described as follows

**Customer value proposition**
In what is the company helping the customers to get an important job done? The way a company is creating value for the customer is through a solution for a specific problem that the customer is experiencing. The company needs to understand the job or need to the fullest and design the offering accordingly. “The more important the job is to the customer, the lower the level of customer satisfaction with current options for getting the job done, and the better your solution is than existing alternatives at getting the job done (and, of course, the lower the price) the greater CVP”. A powerful CVP is designed when a real job/need is in mind when designing it and when it gets that job done perfectly, to get the precision of nailing a specific job is difficult to achieve, many try to achieve a lot but that will end up in doing nothing really great. One way of creating a CVP is to think about four common things that hinders people to get jobs done; insufficient wealth, access, skill, or time.

**Profit formula**
The profit formula consists of a revenue model (price times volume), cost structure (direct costs, indirect costs, economies of scale, primarily costs of key resources), margin model (contribution from each transaction to reach profit), and resource velocity (speed of turnover in inventory and assets). It is a blueprint to display how the company is creating value for itself while delivering value to the customer.

**Key resources**
All assets that are needed to deliver the value proposition to the customer. What are the key elements and how are those interacting?

**Key processes**
Operational and managerial processes that allow companies to successfully deliver value to the customer, “…in a way they can successfully repeat and increase in scale” (Johnson et al., 2008, p. 53)

Companies should be confident that the opportunity to reinvent a business model is large enough for it to be worth the effort, and there is not a meaning in investing in a new business model unless it is new to the industry or market, not just the company. “Pursuing a new business model that’s not new or game-changing to your industry or market is a waste of time and money” (Johnson et al., 2008, p.56). Therefore the understanding of the industry and the market is important, both the current state and the future. It is stated that it is the business model that is disrupting the market rather than the technology itself, a well known example (Clayton, 2004). It is further stated that a breakthrough innovation rarely emerge from established businesses since the innovation needs its own new business model. Therefore the importance of understanding the company’s business model in a granular level provides the condition of reinventing it. To create a new business model, one have to identify a important job to be done meaning that a “fundamental problem in a given situation needs a solution” (Johnson et al, 2008, p. 3)

**Preliminary summary**
Business model design can lead to profitable innovations if one can understand the business design operations, customer needs and technological trajectories. It can be used as a tool to develop strategies, and by comparing units of business it is possible to use the tool without having an in-depth knowledge about company resources and capabilities. All these benefits that have been mentioned are the reason for using business model design as a tool to analyze the research company and finding business opportunities in e-commerce of groceries. For this thesis the definition by Johnson et al. (2008) has been chosen, the authors define a business model with four elements that are interrelated and will create and deliver value together; Customer value proposition (CVP), Profit formula, Key resources and Key processes. The new business models will be developed through an understanding of the changes that occur on the market due to e-commerce of grocery.
This chapter provides a description of Tetra Pak and its business model. The business model includes four elements, from the point of view of Johnson et al. (2008) including customer value proposition, profit formula, key resources and key processes. Tetra Pak’s business model will act as a base for the subsequent process, mainly when business opportunities are articulated.

Customer value proposition

Tetra Pak is a world leading company to specialize in complete solutions for processing, packaging and distribution. Creating value for its customers is central for Tetra Pak; value is created by having the broadest product portfolio in the industry and always aim for innovation for the benefit of the customers’ competitiveness and satisfaction. Moreover, the product portfolio consists of packages, processing equipment, filling machines, distribution equipment, and service products. Furthermore, the product categories that Tetra Pak target are mainly liquid food such as dairy products and juice products, however they have extended their product categories to some food products as well such as cheese, canned food, and pet food to name a few. Tetra Pak also has its own product development centers that provide their customers with new products for the end-consumers. Sustainability is highly integrated into the business and the focus is always to keep the raw material and energy consumption at a minimum during manufacturing and distribution.

The packages take different shapes (squares, pyramids) that are more efficient for stacking during distribution and on shelves. The aseptic packaging extends the shelf life and eliminates the need for refrigeration, making ambient distribution possible for fresh produce. The carton packages consist of unique laminated material, polyethylene and aluminum foil to protect from light and oxygen. The motto Protects What's Good entails that they protect the product with their processing and packaging solution; the processing allows sterilization and the packaging preserves taste and nutrition over time without preservatives.

In short the benefits regarding the value proposition are the possibilities to increase the shelf life and have ambient distribution of fresh produce, which makes it possible to transport the products longer distances, and to have longer time-spans between production and consumption.

Profit formula

Any successful company is operating according to an affective business model thus leading to profit. With the above mentioned value proposition, Tetra Pak targets a specific customer segment (food producers) with a clear definition of what job to be done and how to offer that job. Tetra Pak offers a processing and packaging solution in which the customers buy the machines to process food and simultaneously package the food, leading to a revenue model in which Tetra Pak profits mainly from selling the packaging material. This type of revenue model is usually called razor & razor blade model (analogy from Gillette revenue model) in which the customers have a onetime payment for the machines and complex aseptic systems, but repeated payment for the packaging material. The machines and aseptic systems are sold with lower margin since these are expensive to produce while the packaging material is sold with higher margin and with economies of scale.

The cost structure indicates how Tetra Pak is allocating the costs in which it is predominantly driven by the key resources required for the business model. The cost structure for Tetra Pak is based on an extreme economy of scale and “one size fits all” thinking. Since Tetra Pak is targeting the huge mass market the investments have been in efficient factories and production
equipment, and a flow with a high utilization rate is built. By having economy of scale the costs for raw material can be minimized, however the biggest investment cost has been the 40 production plants that are located globally.

**Key Resources**

Key resources are eminent in order deliver the customer value proposition in a profitable way. It is worth to mention that Tetra Pak represents over 60 years of experience in creating solutions for efficient food production (mainly dairy products), with customers all over the world, and this gives them incomparable expertise. The expertise include among others, the aseptic technology (world leading in heat transfer technology), optimized line flexibility and uncompromising food safety.

A standardized production allows Tetra Pak to secure deliveries. Tetra Pak has 40 production plants spread out globally, and all of them produce identical output. Meaning if one plant is out of function they can easily switch to another plant without any disturbance or differences in the output. Furthermore to have outpost plants globally shortens lead time and distances to customers, which is both good for the environment and for the customer satisfaction.

Moreover Tetra Pak has a strong sales organization. It is very important for Tetra Pak to maintain a close relationship with the customers and focus on growing together with them. Tetra Pak try to tailor the solution depending on who the customer is and what challenges they are facing.

**Key Processes**

Part of Tetra Pak’s strategy is to adapt to customer needs, consumer needs, and changes in market dynamic. Investments in technology and new products are made in order to respond to the emerging needs and market changes. In order to stay ahead of the market, it is crucial to identify trends that change the behaviors and needs of end consumers that in turn push organizations for innovative solutions to offer a better experience and convenience. Therefore one key process includes research and development (R&D). Tetra Pak is constantly working to develop and optimize the offerings and improve or extend the product portfolio.

This is the growing relationship they have with their customers, together they are able to meet the consumer demands and adapt to market changes. This leads to the importance of the role the accountant managers have, which enables a close collaboration.

Tetra Pak is conscious of the importance of radical innovation and the threat represented by the low-cost producers, hence the importance of discovering new market or embedding new meanings into the current business model.
4 METHOD

This research has been about exploring the unknown and wide area of e-commerce of groceries for a packaging and processing company called Tetra Pak. The research questions have been constructed to first describe and understand the differences in the value chains due to e-commerce of grocery and secondly understand implications on a packaging system and lastly analyse findings to find means to explore business opportunities for Tetra Pak. The results are structured to give a logical order of findings, such as the value chain for e-grocery (which is used to compare with the traditional grocery value chain), the challenges met by e-grocers (which are later used in the discussion about business opportunities), technological trends and stakeholder map (which are used to understand the market thereby develop business opportunities) and the current business model of Tetra Pak (which has to be understood in order to evaluate if business opportunities are feasible).

![Figure 4.1: The research process](image)

**4.1 Research process**

In this research process, there were sets of activities that unfold over time in order to answer the defined research problem. The process took time and consideration and it was a process which was modified and/or changed over time. Furthermore, this process had its stages that entailed different tasks, for example, the first stage included clearly defining the research problem and objective (Ghauri and Grønhaug, 2010).

E-commerce of groceries, even though a relatively old concept has generated big growth over the last few years and it is gaining market shares in the grocery retailing industry. With that background the value chain for traditional grocery versus the e-grocery in order to provide with a better understanding of the similarities and differences between the value chains. Furthermore,
the focus has been to extract potential business opportunities within the new channel of grocery shopping.

The first step consisted of defining a scope for the project; all the parties understood that it would be too comprehensive to investigate every part of the value chain. Therefore before deciding what areas that needed more investigation some research needed to done. It soon became clear that not much research had been conducted for the e-grocery landscape and it was relatively unexplored, especially considering the implication it has on a packaging and processing company thus leading to sticking with a broader scope with a holistic system perspective. Research on e-grocery is still in an early phase (Lu and Su, 2009), and there is a lack of methods aim to analyze the supply chains and how business-to-business partners are affected by the new supply chains (Cagliano et al., 2015).

With that in mind, it was further understood that a systems perspective had to be decided and thoughts was exchanged into the various perspectives including the brand owners, e-grocery retailers or end consumers. The consumer perspective was out of scope due the reason that it would not provide with a sufficient understanding into the new value chain and it was concluded that a consumer perspective would not provide with innovative solutions since the consumer often times do not know what they want. Furthermore, this type of study would be dependent on surveys with the end consumers meaning that the sampling would need to be large in order for it to be valid, which is the biggest challenge in surveys and it turned out that Svensk Digital Mathandel together with HIU research conducted a consumer research in which they had a sampling of 5000 people thus leading to a conclusive research on consumer insights regarding buying groceries online. The brand owners’ perspective was also excluded due the difficulties it would provide in doing a primary research since this study is performed at Tetra Pak and it was mentioned that it could potentially be a little bit sensitive topic for them since they might feel somehow threatened. Lastly, it was decided that a retailer’s perspective is going to give this study the research answers needed and provide with insight for future business opportunities for Tetra Pak. It was concluded that the main changes and challenges were happening in the activities and processes that e-grocers were operating in thus making it a critical point to understand what these activities and processes include and back cast them to Tetra Pak.

The empirical research is the main point of this study, consisting of a qualitative research of e-grocers since this would lead to an in-depth understanding of the new value chain. Furthermore, the scope included the Swedish market and the UK market, but it was decided that only the e-grocers in Sweden would be interviewed since this study is based in Sweden, and secondary research would be applied for the UK market. In Sweden currently there are only four e-grocers with full assortment to interview; two store based and two pure online e-grocers. Unfortunately the interviews with the store based could not be conducted since they did not want to participate. The interview questions included an open view of the market and business operation instead of only focusing on for example the packaging challenges. The aim for the empirical research including interviews, studying consultancy reports, reading articles, and attending conferences, was to identify latent needs hence questions covering the whole system perspective and scanning through the market. During the data collection, it was implied that the future of e-grocery is not static but rather it is in the initial phase with high growth pace thus leading to an unclear future. These introduced to the method of foresight in which technological trends that impact the market was being analyzed and further yield insight into the solution offered to the market.
Consequentially, the research process provided with great insight into how the current market look like and how it might develop in the future. This insight is further useful when analyzing Tetra Pak and its business and find business opportunities for the future.

4.2 Research Design

According to Yin (2009), when choosing a method there are three types of conditions to be considered beforehand: (1) the type of research questions that is posed, (2) the extent of the control a researcher has over actual behavioral events and (3) the degree of focus on “contemporary as opposed to entirely historical events”. Hence, leading to what type of research strategy one should conduct, such as case studies, experiments, analysis of sources or historical studies etc. (Yin, 2009).

E-grocery, as explained previously, is a relatively new area of investigation especially from the perspective of a packaging and processing company in which they play a unique role with their product and service solutions. The existing theories do not provide sufficient information that could answer the research questions and therefore a fresh perspective is necessary. The study will therefore start with exploratory research and the subsequent study will be descriptive and analytical in nature when describing future business segment (Ghauri and Grønhaug, 2010). By conducting an exploratory research, key issues and variables will be identified. A descriptive research could start with questions such as, "What similarities or contrasts exist between A and B?"

A cross-sectional study was chosen for this specific type of research and it can be descriptive and analytical. A cross-sectional study is observational and is carried out over a short period of time. This type of study is usually conducted to understand and estimate the prevalence of a certain outcome for each study participants. Furthermore, cross-sectional study for a population of a certain interest is seen as a 'snapshot' that provides information, including risk factors or exposures. Cross-sectional planning is commonly used for health planning. Many cross-sectional studies use surveys, but interviews with each unit of interest can also be utilized (Mann, 2003) which was the case for this study. Moreover, the firm wanting to investigate e-grocery to potentially identify future business opportunities and the theory that specifies a specific set of outcomes in this specific situation has yet to be developed leading to the observational study for the systems of interest being analyzed towards the perspective of a packaging and processing solution provider. The advantages with cross-sectional study are its inexpensiveness and take little time to conduct. Furthermore, many risk factors and outcomes can be gained. The disadvantage is that it is only a ‘snapshot’ meaning that a different result would come out if a different time frame had been chosen (Mann, 2003).

4.3 Data collection

Qualitative data is most commonly gathered through interviews, observations, artifacts, and documents (Miles et al., 2013). Two types of data collection were conducted; primary data was gathered through interviews with e-grocers and observations at two e-commerce conferences/summits, and secondary data came from interview transcripts done in the past and consultants reports.
4.3.1 Interviews
The purpose of the interviews was to create an understanding of the e-grocery value chain and to investigate if there are any challenges and unmet needs. An interview can be structured, semi-structured, and unstructured. Structured interviews are mostly used for quantitative research with survey approaches, and the semi-structured and unstructured interviews are mostly used in qualitative research (Edward & Holland, 2013). For our purpose a semi-structured interviews were conducted. Questions and topics are the same across different semi-structured interviews; however there is a lot of flexibility in how and when the questions are asked, so the interviewee gets the chance to answer freely and the interviewer the chance to understand thoughts and interpretations of the question (Edward & Holland, 2013). The data needs to be processed in some way before it can be analyzed, for example audio recordings need to be transcribed, field notes need to be extended and refined, and so on (Miles et al., 2013). For this study the recorded interviews were transcribed.

Since the qualitative research data generation is a process the term sampling is usually viewed as inappropriate, yet theoretical sampling is a way of selecting interviewees based on the relevance for your theory, or snowballing is a way of networking through participants and finding the next relevant interviewee (Edwards & Holland, 2013). For this thesis the interviewees were chosen based on their insight into the e-grocery value chain and the challenges that are being faced by e-grocers, hence e-grocers themselves were sampled for the interviews. Two out of four currently existing e-grocery actors that offer full assortment groceries in Sweden participated in interviews, the two that did not participate are brick-and-click i.e. brick and mortar retailers that have started online retailing complementary to their offline operations.

The first interview took place at MatHem, with the CEO Assistant, who gave a tour of the warehouse, talked about the warehouse layout and everyday work. She answered the interview questions in between the tours, in an office. Some questions were further elaborated by more specialized staff, one from warehouse logistics and one from procurement. Since the interview was conducted at MatHem’s warehouse the interviewers got the chance to do some observations as well. The second interview was with the CEO of Mat.se, it was conducted through two video calls, whereas the interviewers wanted to find the strategic thinking and vision behind the business but also more practical issues and challenges.

Before the interviews the respondents were informed about the purpose and scope of the interview. All interviews were recorded and transcribed, and summaries of the interviews were sent to the respondents who got the chance to correct if any misunderstandings were found. The interview summaries can be found in Appendix A.

A leading market in e-grocery is the UK market; therefore e-grocers from UK represent more developed retailers that can give insights about needs and challenges that have not yet been experienced in Sweden. Several interview transcripts from interviews with Tesco, Sainsbury, Ocado, and Asda were analysed to gain a better understanding of e-grocery. The questions in these interviews were not set by the writers of this thesis, whom had no impact on how questions were asked and could not ask follow up questions. The interview transcripts show that the focus was on finding how packages are affected by e-commerce however there are more general questions and answers concerning other challenges as well.

4.3.2 Conference and summit observations
The authors went to an e-commerce conference where they spent a full day, it gave insight into the e-commerce industry from different perspectives, and key findings were that e-grocers face more complex challenges than for example e-commerce of clothing due to the special
requirements on distribution of food products. An e-commerce summit was also visited, two full days of presentations and exhibitions gave the authors more insight into different solution offerings that exist, especially for warehouse logistics and packaging. The summit was likewise the conference for different kinds of industries working with e-commerce hence the authors had to consciously choose presentations and exhibitions relevant for the research purpose. One of the key learning from the summit was that e-commerce is just another sales channel, and it should not be regarded as something separate from other channels, integrating channels and giving the consumer a seamless experience should be the goal for all businesses.

4.3.3 Study of archival documents and articles
Archival documents and articles were studied to enhance the understanding of online grocery retailing and complement the interview data. These documents included consultant reports on e-commerce, grocery retailing and technological trends, and newspaper articles and journal articles were also studied to understand where the market is at currently, and what the drivers and trends are. For example seeing that a lot of articles actually bring up the topic of e-grocery hints that there is a movement going on at the moment and there is a relevance of studying it for Tetra Pak as a packaging and processing company.

4.3.4 Summary of data collection

<table>
<thead>
<tr>
<th>RQ</th>
<th>Purpose</th>
<th>Mean</th>
<th>Who</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2</td>
<td>Understand value chain for e-grocery and needs/challenges for e-grocers</td>
<td>Interview meeting face-to-face</td>
<td>CEO assistant &amp; Procurement and Logistic staff at MatHem</td>
<td>2 hours</td>
</tr>
<tr>
<td>1,2</td>
<td>Understand value chain for e-grocery and needs/challenges for e-grocers</td>
<td>Interview meeting video call</td>
<td>CEO at Mat.se</td>
<td>2 times á 1 hour</td>
</tr>
<tr>
<td>1,2</td>
<td>Understand needs and challenges for e-grocers</td>
<td>Interview transcript</td>
<td>Marketing and Commercial Director at Ocado</td>
<td>1 transcript</td>
</tr>
<tr>
<td>1,2</td>
<td>Understand needs and challenges for e-grocers</td>
<td>Interview transcript</td>
<td>Senior Manager E-commerce at Asda</td>
<td>1 transcript</td>
</tr>
<tr>
<td>1,2</td>
<td>Understand needs and challenges for e-grocers</td>
<td>Interview transcript</td>
<td>Online Development Manager at Sainsbury’s</td>
<td>1 transcript</td>
</tr>
<tr>
<td>1,2</td>
<td>Understand needs and challenges for e-grocers</td>
<td>Interview transcript</td>
<td>Packaging manager &amp; Technical Packaging Manager at Tesco</td>
<td>2 transcripts</td>
</tr>
<tr>
<td>1,3</td>
<td>Inspiration for business opportunities and more knowledge about the value chain.</td>
<td>Participation in Emeet (e-commerce conference)</td>
<td>Representatives from different parts of the e-commerce industry, relevant for this thesis were Mat.se (CEO), MatHem (market rep.), and Volvo</td>
<td>1 full day</td>
</tr>
</tbody>
</table>
Table 4.1: The qualitative data collection

<table>
<thead>
<tr>
<th>1,2,3</th>
<th>Inspiration for business opportunities and more knowledge about e-commerce in general. Listen to experts talking.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Participation in e-commerce Stockholm (e-commerce summit)</td>
</tr>
<tr>
<td></td>
<td>Representatives from different parts of the e-commerce industry, relevant for this thesis were Mat.se (CEO), Ifoodbag (sales rep.), and firms for e-commerce logistics solutions.</td>
</tr>
<tr>
<td></td>
<td>2 full days</td>
</tr>
</tbody>
</table>

### 4.4 Data analysis

#### 4.4.1 Qualitative data analysis

Qualitative data analysis can be described by three types of activities; data condensation, data display, and drawing and verifying conclusions, these interwoven activities accrue before, during and after data collection in parallel (Miles et al., 2013). Data condensation is the process when transforming the raw data into stronger, more focused and organized data in a way that final conclusions can be drawn and verified. Writing summaries, coding, theme development, generation of categories, and analytic memos are some examples of data condensation, and it is meant to focus, sort, organize and discard data (Miles et al., 2013). Data display is about creating a compact and accessible form of information presentation to enable the analyst to see what is happening and decide what should be done next; either drawing conclusions or suggest the next step. Different types of matrices, graphs, charts, and networks could be used for this purpose (Miles et al., 2013). Lastly conclusions drawing and verification are both equally important since the analyst needs to verify drawn conclusions to proceed; the perceived meanings have to be tested for their validity (Miles et al., 2013).

There is a strong possibility to understand and discover latent issues through qualitative data, since it is emphasized on a specific case where all factors in a context are considered, moreover qualitative data is known for its richness and holism, and one can discover and describe complexity (Miles et al., 2013). Thereof it is possible to find the meanings behind events, processes and structures in people’s lives and social world.

It is advised by Miles et al. (2013) that the data analysis is conducted simultaneously with the data collection to enable the possibility to generate strategies for new data collections and filling the gaps of existing data, the process should be viewed as non-linear and iterative.

#### 4.4.2 Coding

Coding is analysis, meaning it is a way of interpreting the meaning behind data and have deep reflections. The transcripts, write-ups and/or the other empirical documents go through a first cycle of coding processes, which are the first codes that are given to data chunks. Followed by a second cycle of coding methods where the first cycle codes are further analyzed (Saldaña, 2013). Most usually codes are used to cluster data into relevant categories; the researcher puts codes on chunks of the data and can then easily cluster the chunks into segments. This makes it easier to recognize, find, and take out applicable data when needed. However it is important to have conceptual frameworks and research questions to avoid overload of data, there might be a lot of
data to handle and if the researcher does not know what matters more, everything will matter and there will be no time to analyze all of the data (Miles et al., 2013).

First cycle coding
The appropriate coding method depends on the specific research, there is no best way, and the researcher has to decide what is best for the goals and nature of the qualitative research (Saldaña, 2009). Saldaña’s (2009) suggests starting off with Attribute coding, Holistic coding, and Descriptive coding in the first cycle coding. Miles et al. (2014) describe these as follows: Attribute coding is a method for basic descriptive information such as fieldwork setting, description of participants, demographics, data format and other interesting variables. Holistic coding is a method that captures the sense of categories that may develop for a large unit of data, instead of having line-by-line coding. Descriptive coding is used to summarize data and describe the topic in one word or short sentence.

These three types of first cycle coding were all used for this study. The researchers used the collected data to describe the value chains for e-groceries to further on capture different categories from the data and lastly describe the topics. For transparency the first cycle coding is basically displayed under the result section where the value chain for e-grocery is shown and the challenges met by e-grocers are displayed by category.

Second cycle coding
The second cycle method is meant for grouping the segments of data from the First Cycle coding into smaller number of categories/themes/constructs. Second cycle coding is also called pattern coding and it usually can be summarized into four interrelated types of codes; (1) Categories or themes, (2) Causes/explanations, (3) Relationships among people, and (4) Theoretical constructs (Miles et al., 2013). Pattern codes can then be used in different ways according to Miles et al. (2013), for example the researcher can write a section that elaborates on the pattern codes, a narrative description. Furthermore matrix display can be used; these show both the pattern and the codes and enable a format for instant overview for reflections, verification, and conclusion drawing. Similar to matrix display a network display gives an overview of patterns and codes, however it also show flows across time or actions.

The second cycle coding was mainly used for the challenge categories that were developed in the first cycle. The second cycle coding was beneficial since it put the challenges into a context and made it possible to understand how challenges interrelate with each other.

<table>
<thead>
<tr>
<th>4.4.3 Summary of data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quotes (Examples)</strong></td>
</tr>
<tr>
<td>“I think, finally from a pack sized point of view, one of the biggest issues we have with our drivers is the weight.”</td>
</tr>
<tr>
<td>“We try to have the best possible system, so if something would be offered that could optimize our process and save us money and time we would definitely consider changing our boxes, paper bags or whatever it is. We always want to develop to be more efficient.”</td>
</tr>
</tbody>
</table>
“We think that price is not everything, what people really think is important is how fresh stuff is and what services they receive.”

“We think that price is not everything, what people really think is important is how fresh stuff is and what services they receive.”

Although, people do tend to favour longer shelf life products, they like to buy their own fruit and vegetables, because they don’t trust the pickers to pick the stuff with the best sell by date.

“So when they look in the cupboard, so your now sort of managing the kitchen almost the same as a sales environment”

“So when they look in the cupboard, so your now sort of managing the kitchen almost the same as a sales environment”

“Delivery slots could be more flexible if the consumer doesn’t have to be home to receive the order.”

“Delivery slots could be more flexible if the consumer doesn’t have to be home to receive the order.”

Table 4.2: From quotes to first cycle coding and second cycle coding for the need analysis.

4.5 Validity and Reliability

Checking validity and reliability of qualitative research studies is difficult since there are no clear directions of what good quality is. It is about the researchers interpretations of the empirical data. Miles et al. (2013) state that the researcher is influenced by personal values, beliefs and attitudes, so the words we choose to document are more our interpretations of our experience that a truly objective view. Thus qualitative data analysis requires researchers with a lot of self-awareness and plenty of care; it is a complex task to handle. In this research the authors have tried to stay open-minded and aware of prejudices, however it still remains that all the analysis is affected by the fact that the authors have a goal in mind which is finding business opportunities for a company, and that affects how interpretations are done.

According to Yin (2009) construct validity, internal validity, external validity, and reliability allow researchers to judge a qualitative research design. For construct validity the researcher has to find suitable operational measures for studied concepts, this can according to Yin (2009) be done through the use of multiple sources of evidence, established chains of evidence and having key informants for draft reviews. For this research the authors have chosen multiple sources by using scientific articles, empirical data from interviews, consultant’s reports, and new paper articles. The chain of evidence have been created through pyramiding since the researches have first tried to find the relevance of different stakeholders within e-commerce of groceries, and then chosen the main stakeholder, i.e. the e-grocers, for interviews and thereafter went back to secondary data to find more information about the findings. Drafts of raw data, coding, analysis and so on has been shared with the supervisors in this research, however the respondents did not review drafts due to lack of time. Miles and Huberman (1994) raise that internal validity is about credibility of study findings, does it make sense and have we found what we are looking for? Triangulation is a method that uses different sources in order to gain a better understanding, and
as Miles and Huberman (1994) puts it, it can also be used to see if conclusions from different sources converge, and in that case increase the internal validity. Doing interviews, reading archival documents and visiting industry events was a way of triangulating and increasing internal validity for this research.

External validity is about whether the research findings can be generalized (Miles and Huberman, 1994; Yin, 2009). For this research the design has been consciously chosen to not be generalized but to cover a specific company, Tetra Pak, the purpose was to find business opportunities for Tetra Pak, however other industry stakeholders might take part of the descriptive parts of this research where e-commerce of grocery is described more generally and challenges are analyzed in general terms. However one has to remember that even though the authors have used a general perspective on the e-grocery value chain and challenges the interviews (both face-to-face and transcriptions) were influenced by the fact that the interviewers represented Tetra Pak. The awareness of Tetra Pak made the respondents automatically connect their answers to packaging issues and other things that they believed was relevant for a packaging company. Finally reliability represents the consistency of a study, if it is reasonably stable over time and across researchers and methods (Miles and Huberman, 1994). Team coding is a good way of checking the reliability, because findings are more credible and trustworthy if two researchers (coders) have coded separately but have similar analysis (Miles et al., 2013). Likewise a coder can test the internal consistency by doing the same coding twice with a few days in between.
5 EMPIRICAL FINDINGS

In this chapter the reader will be provided with an adequate picture of the market for the e-grocers value chain but also provide with a general comparison between the traditional grocery and e-grocery. The first section presents an overall description of the traditional grocery and thereafter a thorough description of the e-grocery activates and processes starting with the consumer interface, back-end fulfillment and last mile delivery operation, this is a prerequisite for the reader to understand the later sections of the chapter. With that follows the key challenges e-grocers are facing and thereafter the technological trends are presented.

5.1 Comparison between traditional and online

Figure 5.1 below illustrates the broader picture of the value chains for traditional grocery sales and e-grocery sales. The main differences are within in the value chain for e-grocery is within the red marker. The authors of this thesis have decided to call the significant changes of the grocery value chain; ordering, back-end fulfilment, and last mile. These sections describe processes which take place from the first interaction between the online grocer and the consumer, till the last mile operation in which the groceries are delivered to the consumer.

But before the e-grocery value chain is compared to the traditional the two value chains will be described separately. The traditional value chain will be described briefly while the e-grocery value chain will be more detailed, this is due to the focus of this thesis being on understanding the e-grocery value chain and find opportunities within that area.

5.1.1 The Value Chain for traditional grocery

In this section a brief description of the traditional value chain for grocery shopping will be presented. It is worth mentioning that the value chain can differ between the various grocery retailers depending on how they are structured and operate. Generally speaking the traditional grocery retailers can be described with procurement, in-store management and distribution
processes. Figure 5.2 shows the value chain for traditional grocery retailers, which includes manufacturers/ producers, distribution centres, retailers, and Point of Sale. Also shown in figure 5.2 are inefficiencies within traditional retailing. The processes and inefficiencies are further elaborated below.

Figure 5.2 Traditional grocery value chain and retailers inefficiencies

**Procurement**

*Order management*

Traditional grocery stores place orders that reflects the store stock; for example ICA has an automated order system in which order are placed after a certain amount of sales of that product, and the aim is to not have empty shelves. Furthermore many grocery retailers work closely with suppliers in European and international procurement networks in which the goal is to create buyer power and provide higher value and better prices for the end-consumers.

**In-store management**

*Quality assurance*

The quality assurance is central for grocery retailers thus making sure that the suppliers are assured carefully before initiating collaboration, ICA make up to thousands of samples a week to ensure the quality of their products (e.g. meat) meet the standard that is set by the company. Groceries, especially fresh produce has a sensitive quality level in which quality control plays a key role when consumers make a purchase decision. Everything product must be safe, fresh and of high quality. Therefore the quality assurance in a store includes for example measuring the temperatures in coolers, the heat for the grilled chicken or wearing gloves when handling the fresh produce.

*Store layout*

Each store is designed in its own way that will provide the consumers with a nice experience as well as providing organized shelves where similar products are in the same section. Some parts in the store are price oriented while other parts are about range and the colonial and freezer sections is more about price and large signs. Planogram is a term used for the planning of the shelf display. Furthermore, there are other sections such as meat or dairy in which they have workers specialized in their area to ensure best possible service for their consumers but also to maintain food safety. A challenge that has been mentioned is that employees often times see their job as temporary leading to grocery stores educating new employees on food safety and
quality control hence becoming a big cost disadvantage. The stores also adapt to consumer demands such as for a better range in organic product leading to retailer focusing on this type of product differentiation hence leading to trends affecting what type of products they would like to procure.

**Product assortment and marketing**

“Food products likely will take a larger share of smaller-store shelves” (Deloitte, 2013, p. 8) which creates a big challenge in supply chain management and distribution centre design. Further, balancing the offerings of both a wide range of food products and as well as highly customization is a key challenge for traditional grocery retailers. Furthermore, packaging plays a central role in food and beverage products and it is stated “50 percent of purchasing decisions are made at point of sale” (Deloitte, 2013, p. 9) hence the packaging conveys brand information and driving sales in store.

**Distribution**

**Storage**
Once the goods are delivered to the warehouse, it goes through different steps before these goods are placed at their shelve space in the store. Firstly, depending on the store layout, all goods that are received goes through an automated process in which the goods are unpacked from their pallets and planned to distribute around the store. They firstly unpack the pallets in which they later are co-packed with other goods in a pallet that is preplanned for in-store layout. Furthermore, the distribution centers have four temperatures areas, including ambient, fresh produce (fruit and vegetables), chilled (i.e. dairy products) and frozen area (IGD, 2015).

**Inefficiencies**
The main inefficiencies in traditional grocery management is the high inventory level, its low forecast accuracy, low shelf availability, high food waste and generally that the replenishment is based on stock levels (See Figure 4:2).
5.1.2 The Value Chain for e-grocery

As mentioned before the value chain for e-grocery can be divided into three sections; (1) prospect/ordering, (2) back-end fulfilment, and (3) the last mile, these are further illustrated as systems with several subsystems below.

Ordering

![Figure 5.3 System of interest for the Ordering process](image)

Website

The website is the e-grocers store, which is where consumers go in order to purchase the groceries by adding products to a digital grocery basket and complete the purchase through card payments. E-grocers in Sweden that are offering full assortments (e.g. MatHem and Mat.se) also have the option of choosing premade recipe baskets. In England on the other hand the online grocery players such as Tesco, Ocado, Sainsbury’s provide only full assortments, however Hellofresh and Gousto is continuing to gain popularity in which the consumer in the UK are able to receive recipe box together with instructions to make the meal in a quick and convenient way (Mintel, 2016).

Inspiration is one of the main features that most e-grocers have on the websites, the inspiration is meant to make the planning of grocery shopping easier and more fun for consumers. The inspiration is provided in form of recipes, filters and algorithms that give suggestions. Recipes can both be found on the e-grocers website, however collaborations between e-grocers and other recipe sites. For example if a consumer is searching for inspiration through the Swedish recipe sites Tasteline they can easily put the recipe into a shopping cart which is automatically linked to the website of MatHem. Moreover increased demand of special diet food (e.g. gluten free, low carb) and changed lifestyles (e.g. veganism) is making consumers utilizing the search function and filters on websites. Consequentially, brand owners need to consider search engines and tags when formulating products. By launching new products that are targeting niche needs and a special lifestyle, their visibility will increase. Listing fees and online service for brand owners
will be a growing income for retailers, including banner advertisement and good positioning (Rabobank, 2014).

E-grocers are creating a personalized experience and service for consumers. At Mat.se for example each time the consumer have used the website to order groceries, the website will remember the shopping patterns through algorithms and create personalized offerings and suggestions. The CEO at Mat.se explains the vision of wanting to offer the consumer the opportunity to not shop at all “…Our vision is that consumers should not have to shop, if they do not want to”.

The digital shelf requires e-grocers to control and communicate what is available and not, and thereby displaying the correct assortment. By having “shelves” online there are no limitations of space, but still e-grocers have to know their capacity in the back-end fulfilment since they do not want to fool any consumers into ordering things that are not available. Products that are displayed on the website have to be communicated with images and descriptions, which are provided by brand owners or sometimes from databases such as Valido, Dabas or OPV. It is important to communicate a realistic image of the product and also presenting the products in an appealing manner to trigger a purchase. It happens that the images sent to the retailer are of low quality, leading to the retailer taking their own pictures that is suited for the website. It also happens that they present certain products in a certain way, for example meat is presented on a cutting board instead of presenting from its packages.

The last step of ordering on the website is the check out. When the consumer is done with picking products to the shopping cart they have to choose a time slot for delivery. These time slots are usually differently priced based on area codes and the time of the day, the reason is to increase the chances that a consumer picks time slots that allow sufficient delivery routes. Lastly the consumer has to pay for the order either with an invoice or directly by card.

**Marketing**

Both MatHem and Mat.se explain that advertisement is one of the greatest costs at the moment. The representatives from MatHem and Mat.se state that many consumers are still questioning if the quality can be as good as in-store and it seems like many consumers do not trust the e-grocers yet. For the e-grocers it is important to attract consumers to try the service and prove that they are better than the alternatives. Creating a seamless and convenient purchasing experience for consumers is one of the value propositions offered by e-grocers. The ability for consumers to enter the online store through different devices (mobile phones, PC, tablets etc) at any given time is providing convenience.

A challenge for e-grocers is to convey the freshness of products through the digital marketing. Consumers are sceptical in regards of buying fresh produce online since they are not in charge of the picking. Word of mouth is believed to have a big impact on consumers since they trust their peers more than regular advertisement.
Back-end fulfilment

**Figure 5.4 Systems of interest for the Warehouse**

**Layout**
The back-end fulfilment reflects on how frequent certain products are ordered, and products are positioned so that time and cost for picking and packing the orders can be as low as possible. This differs of course depending on the type of warehouse. For example an automated warehouse has a different type of layout compared to a manual. Furthermore an e-grocer which is store based could pick the groceries in-store which also affects the back-end fulfilment layout. The e-grocers constantly plan the placement of the products in order to achieve as high efficiency as possible for the staff. The layout will also reflect the environments that are required by different product categories; ambient, chilled and frozen products need to be placed in certain temperatures. MatHem has different zones for ambient, chilled and frozen, further they have divided the warehouse into high, low and super low frequency zones. At Mat.se they have a so called floating storage, meaning that no product have a fixed shelf space apart from some products like milk due to high frequency of orders. By knowing the size of the product the system will choose a suitable and available shelf place for that product. Mat.se also has a fridge and freezer zone. Inventory planning and optimization is continuously worked with.

**Inventory**
Having one day delivery from the suppliers for fresh produce is a necessity due to expiration dates, e-grocers do not sell products until the last expiration date, and for instant Mat.se and MatHem usually promise five days of durability on the fresh produce (e.g. milk). Before gaining sales volumes the e-grocers need to procure from wholesalers who can provide with one day deliveries and supply smaller quantities of different products. Ordering directly from suppliers (brand owners or manufacturers) requires more work since each supplier has a different way of placing orders and they usually have a minimum volume for order, so the smaller e-grocers cannot reach those quantities when it comes to products with short shelf life. Nevertheless there are some positive aspects of a direct contact with suppliers, since they are able to communicate
closely on certain problems such as damaged packages or uneatable products. Mat.se expressed that they cannot afford to exclude the wholesaler: “We could not survive without our wholesaler, since we cannot handle too many articles with small volumes. The larger volumes we can take directly from suppliers.”

Moreover, in regards of receiving the orders it is important to have high delivery reliability since missing products can create insufficient work flow in the warehouse, and consumer orders could be delayed. Furthermore, the pallets need to be better packed since there is a higher risk for crushing if the pallets are poorly packed.

Forecasting means that the retailer is able to predict the order quantity each night and what the orders consist of, it will provide retailers a much better procurements that does not exceed the needs thus leading to saving costs and waste. E-grocers want to order an amount of products that is meeting the consumer demand, in order to decrease the waste of products. MatHem have a shop for the staff where everything that is not sold will be available for the staff with 50% discount and Mat.se give away the surplus to charity.

**Order fulfilment**

All orders, both at MatHem and Mat.se are being picked manually. MatHem has implemented a technology, called “pick by voice” in which the pickers are being told how proceed to ensure the right order to be handled at the right time. Mat.se use tablets attached to the carriers, which indicate with pictures and numbers where the product is positioned. Once the order picker knows what product to pick and where it is located, the order is then loaded into paper bags and those paper bags are placed in boxes that are being moved around with wagons. MatHem mentioned that if a better offer turned up which could optimize the workflow they would definitely consider implementing it. The e-grocer which pick from existing stores use a manual picking and packing, which is problematic since the employees could get in the way of ordinary customers. Ocado has a highly automated customer fulfilment centres in which they automate many manual tasks. The software that controls the activities is crucial and it is largely in-house developed by Ocado. A single customer fulfilment centre of Ocado can prepare 1 million groceries per day.

Controlling the quality is an important step to follow in order to sustain and ensure high quality of products. For example temperatures are measured throughout the flow to make sure that the groceries are stored in the right environment. Since the consumers do not pick the groceries by themselves every grocery will be scrutinized by the consumer when they unpack it at home. To make sure that the groceries meet the expectations for example MatHem has trained the staff in the department for fresh fruits and vegetables to handle the products with special care. At Mat.se has stated that they have several controls, both when buying from the suppliers and before picking and packing to ensure that the product is in good quality before sending it to the consumer. Ocado also always check the product quality when they have received orders from the suppliers.

When packing the orders both MatHem and Mat.se explained how square shaped packages are the easiest to pack (e.g. Tetra Pak milk packages). Once the orders are packed and ready for distribution to the consumers the blue boxes are placed in the right order so that the orders that are loaded into the vehicles match the route. In the meanwhile the orders that are finished are stored so that the product freshness is sustained.
**Transportation**

Both MatHem and Mat.se own their own distribution solutions, meaning that they are handling all the processes during the last mile except for their route optimization software that is provided by an external party. The process includes maintenance of the vehicles, customer service and the cold chain distribution to preserve product quality.

Special route planning systems are used in which the routes are optimized. E-grocers have specific postcodes that they have decided to deliver to, in order to make sure that the consumers are within an area that is manageable and profitable.

MatHem and Ocado have different zones in their vehicles, both refrigerator and freezer systems. Mat.se use iFoodbag (isolating grocery bags) for their frozen grocery products, this secures the temperature not only during transportation but it also provide with a flexibility that allows them for example to deliver directly into Volvo cars (with the application “Volvo On Call”).

**Delivery models**

Being able to offer same-day delivery is a competitive advantage as it seems today. In Sweden the home delivery model is dominating, while click & collect is not as popular among the consumers (Svensk Digital Handel, 2015). In the UK both home delivery and click & collect services are offered by e-grocers. The reason that home delivery is dominating in Sweden is due to the convenience it provides and it was mentioned at MatHem that a survey indicated that the consumers prefers home delivery over click & collect. Furthermore, in the report by Svensk Digital Mathandel (2015) it was asked what the main benefits were with online grocery shopping in which the top reason was the home delivery and avoids dragging along grocery bags.

There are two aspects that online grocery retailers need to consider in regards of last mile operation. Firstly being flexible in providing a range of time slots for its consumers with delivery precision, consumers do not want to wait for their groceries without knowing when it will arrive.
Secondly sustaining the cold chain with freezer systems, special isolating bags and boxes or other innovative solutions, since the grocery products are sensitive and need to be preserved with the right environment. Since the last mile has been a great challenge a lot of options has emerged in order to solve the problem.

As a starting point when classifying e-grocery delivery model the interface between the consumer and retailer should be taken into consideration. Depending on where the groceries are delivered, the interface between consumer and retailer differs. Consequentially, looking at home delivery it can further be classified according to Figure 5.6 below.

![Home delivery models](image)

*Figure 5.6 Home delivery models*

Attended deliveries imply that someone has to receive the order, the delivery can either be by vehicle (with a driver) or for the future it could be by autonomous cars (e.g Starship Technologies) or autonomous aircrafts (e.g. drones). In Sweden deliveries are currently only done by vehicles while in the UK the concept of Starship Technologies is currently tested (further information in section 5.4). Observing outside Europe, there are various food retailers testing food delivery by drones, i.e Foodpanda in Singapore, it is stated that it can deliver within 30 minutes (CNBC, 2015).

Unattended delivery is when the consumer is not present and can be categorized into reception box, home access system and communal reception box. A reception box facility is when the box is attached to the house, thereby making unattended home delivery possible. Such a solution does not exist in Sweden at the moment but it was mentioned by the CEO of Mat.se in a conference that they are testing unattended reception box delivery and according to him it has been working so far. Home access, is when the delivery man has the possibility to unlock the front door and deliver directly to the fridge. This solution is rather a relative new concept and in Sweden there have been reports that the big grocery chain ICA has partnered up with Postnord and Glue to implement such a solution and a test pilot is under review (DI Digital, 2016). Lastly, there is the communal reception box in which it is possible to deliver at a station near the house, for example it was reported that MatHem is in collaboration with Slättö real estate for a future solution wherein Slättö is going to provide its tenants with storage for grocery delivery in the entrance (Slättö, 2016). Furthermore, Jonas Ogvall, CEO for Svensk Digital Mathandel mentioned in an interview that a solution could possibly include that the laundry rooms be converted to fridge/freezer rooms for food deliveries (ComputerSweden, 2015).

Moreover, there is the other option of delivery model, called click & collect that is presented further in Figure 5.7.
Having community collection points, locker collections and drive-thru collection are the most common models and the location in which the food is delivered is not fixed. It can be places of work, bus stations, petrol stations, subways, service stations etcetera. Click & collect is very common among the big online grocery retailers in the UK, (e.g. Tesco, Ocado, Sainsbury’s’)

At MatHem the home delivery services is dominating but other solutions like click & collect at a gas station parking lot is provided, but it is worth to mention that it is rarely used since in Sweden the preference is to get home delivery.

In-car delivery is a new concept which was introduced on the Swedish market in 2015. Mat.se is currently the only e-grocer that provides in-car delivery in collaboration with Volvo. Volvo has an app called Volvo on call, which makes it possible to unlock the trunk and deliver into the trunk. Furthermore, Mat.se would not be able to have in-car delivery if they did not have collaboration with iFoodbag, in which it promises to protect the grocery products during 24 hours, especially fresh produce and frozen food (iFoodbag, 2016).

There is a challenge in flexibility that last mile solutions are trying to achieve and it has been expressed as follows by Mat.se: “Conventional stores are unbeatable when it comes to flexibility, consumers can just run back into the store and buy whatever they have forgotten; maybe someday we might be able to do this, when our sales volumes increase.”. The flexibility that the e-grocers have achieved today is to be able to offer same day deliveries and offering one hour time slots to the consumers.
5.1.3 Differences between traditional and online grocery retailing

By comparing the two value chains for grocery retailers (traditional vs. online) the authors have found eight differences that are presented in table 5.1. In the table the differences are described as we are moving from the traditional grocery value chain towards the e-grocery value chain.

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional business models</strong> where consumers buy on demand from traditional grocery stores.</td>
<td><strong>Complex business models</strong> with new payment systems, subscription models, and delivery alternatives. Everything to stay competitive in a transparent market.</td>
</tr>
<tr>
<td><strong>Shelf display</strong>, using planograms, a schematic way of placing products in its sections. Packaging for shelf impact is informative and promotes sales in the store shelves.</td>
<td><strong>Personalized online interface (Website)</strong>, no fixed shelf spaces, instead by implementing filters in line of the consumers’ diets and lifestyle is providing a more personalized interface.</td>
</tr>
<tr>
<td><strong>Limited shelf space</strong>, traditional stores are restricted to a space in which they adapt their layout and product display. Shelf space is important for marketing and bigger brands are dominating shelves.</td>
<td><strong>Unlimited shelf space</strong>, which allows a large range of products. Smaller brands benefit from such a platform.</td>
</tr>
<tr>
<td><strong>Consumers taking responsibility</strong> for the product at point of sale, and transporting the groceries home safely.</td>
<td><strong>Retailers taking the responsibility</strong> to distribute the groceries all the way to the consumer, either through home delivery or collections points.</td>
</tr>
<tr>
<td><strong>In-store shopping and experience</strong>, consumers shop more frequently with higher impulse buying. In-store experience or other customer facing forums for brand building.</td>
<td><strong>In home shopping and experience</strong>, consumers plan their shopping more thoroughly with bigger basket sizes (bulk shopping). The in-home experience is important for brand building</td>
</tr>
<tr>
<td><strong>Procurements to stock</strong>, retailers want to have full shelves and order accordingly.</td>
<td><strong>Procurements to order</strong>, e-grocers can predict the demand and procure according to the demand instead of stocks.</td>
</tr>
<tr>
<td><strong>Mono-channel</strong>, products are adapted to store display and a small number of SKU’s per category</td>
<td><strong>OMNI-channel</strong>, products must meet the need of both online and offline since new sales channels interact in real time e.g. promotions and stock levels are tracked across channels.</td>
</tr>
<tr>
<td><strong>Sustainability as a CSR</strong>, marketing for organic food is the main marketing tool for sustainability.</td>
<td><strong>Sustainability as a source of cost competitiveness</strong>, significant lower food waste rate. Further, e-grocers argument that transportations are decreased since a centralized delivery rather than decentralized.</td>
</tr>
</tbody>
</table>

*Table 5.1. Description of differences from the traditional grocery value chain to the e-grocery value chain*
An overall difference can be found in the business models of e-grocers compared to traditional grocers. E-grocers tend to have complex business models to differentiate from the competitors on a highly competitive and transparent marketplace. An online consumer has the opportunity to access more than one grocery store at the same time and easily compare them, and in the end choose the one that has the best offerings (i.e. price, range, delivery charges, etc.). The level of transparency makes it crucial for e-grocers to be innovative and differentiate.

Traditional grocery stores use planograms shelf layouts, while e-grocers have to design an appealing website instead. The websites can be programmed to store and recognize a certain consumer’s preference. That will give each consumer a personalized (web) store layout which meets their specific demands. The consumer can also choose to use different filters to find specific products online, such as special dietary products. Primary and secondary packages are designed for shelf impact and have to be appealing to promote sales in-store, however packaging for e-grocery have to consider other factors. As mentioned e-grocery will take place on a website, where products are displayed graphically, which will make the sales promoting role of the primary packaging less important. The packaging for e-grocery will be more about e-commerce logistics such as picking, packing and going through the last mile.

Furthermore e-grocers are not restricted to a limited shelf space as traditional grocers are. Traditional grocery stores need to plan every part of the store, including the shelves, to make sure that everything has its own placement. This limitation together with the requirements on planograms makes it harder and more time consuming for a traditional store to add product to the assortment. The placements of products in these limited shelves also favour the bigger brands, the niche products are usually placed in corners and more hidden spaces. Consumers usually do not find the niche products if they are not big and visible enough. An e-grocer is much more flexible, since it can start to sell something immediately without having the products in stock. E-grocers can test sell something without having a full shelf, since the product is presented online with images and content description. For the e-grocer it is enough with a few samples or just a deal with a supplier to deliver immediately when an order is placed by a consumer. This is an opportunity for smaller suppliers to see if there is a demand for their products at all. On the website every brand has the same amount of “shelf” space, the content becomes important, e.g. to tell a story about a product/brand.

When shopping in a traditional grocery store the consumer has the responsibility to pick the product from a shelf, pack it into a grocery bag and transport it home. All of these responsibilities are outsourced to the e-grocer instead of the consumer when shopping online, meaning that the groceries are picked, packed and transported by an e-grocer. Easy picking, packing, and optimized fill rates are required by the e-grocers. E-grocers have to make sure that the groceries are delivered to the consumer intact and with a high quality. Online consumers are more willing to share dissatisfaction regarding product quality, and e-grocers usually communicate the feedback to brand owners, which creates a fast feedback loops between consumers and producers.

In-home shopping means that consumers can order groceries online sitting at home or on the go. This affects the fact that consumers are not as prone to do impulse buying as they usually are in a traditional grocery store. Online grocery shopping also requires that consumers plan ahead what they need since they often need to reach a minimum amount of groceries to get free deliveries. Online consumers cannot shop groceries last minute since it at least takes half a day before the groceries will be delivered. So the flexibility that consumers have with traditional stores that easily can be accessed within a distance for local consumers is not available for online
consumers. The planning is stated to be easier when consumers are based in their home where they can check what is missing in the kitchen. Moreover brand building differs in traditional stores versus online, going from brand building through in-store advertisement and display to an in-home experience with an un-boxing experience for brand building. This means that the consumer will create its conception of brands in the home when un-packing the groceries, and not when walking around the grocery store.

The traditional grocery stores make procurements and handle inventories so that the store shelves always are full, this requires forecasts in order to meet the expected demand. However the traditional grocery stores cannot know exactly the amount that will be sold, they can only make predictions. E-grocers on the other hand have the opportunity to meet the demand of consumers through actual orders that are placed. Since the majority of consumer orders are placed before the delivery day the e-grocers can match the demand with their procurements and decrease the amount of food waste.

For the store based e-grocers omni-channels, i.e. having more than one type of sales channel, have to be handled and work together seamlessly. Stock levels and promotions have to interact across channels and the e-grocers need to be aware of getting sales through both channels without one cannibalizing the other. With the traditional grocery stores a physical store was the single channel to handle, the number of SKU’s are lower and mainly a store display has to be considered. E-grocers need to think about how to create a seamless experience for the consumers.

For traditional grocers sustainability is usually just a tool for marketing and CSR, while e-grocers use sustainability as a source for cost competitiveness. For example e-grocers use less transportation in their back-end operations since they do not have several stores to provide with groceries. Instead e-grocers have a central back-end fulfilment centre. E-grocers also argue that they decrease the amount of transportations made by consumers since they deliver groceries collectively. Another aspect of sustainability is the waste reductions stated to be done by e-grocers. Traditional grocers have to fill shelves with products to make it look appealing and therefore they order to stock up in shelves. E-grocers on the other hand can order based on consumer demand which makes it possible sell everything in stock and reduce the need to throw away food.

5.2 Challenges faced by e-grocers

In this section the key challenges, experienced by e-grocers are presented. These are based on interviews and observations obtained during this research. The main areas presented below are needs that e-grocers would either like to obtain or needs for efficiency and optimization. Within those needs being Quality, Flexibility and Collaboration are challenges e-grocers are experiencing leading to the needs. They include grocery quality, communicating freshness, on-demand delivery, procurement, packaging requirements and e-grocery infrastructure.

5.2.1 Quality

Product quality and communicating freshness are interrelated since fresh produce is emotionally important for consumers and the quality has to reach expectations. E-grocers need to communicate the freshness and the high quality of its products to promote their service and further increase their sales volume, and also have high retention of consumers. Further, sustaining the cold-chain distribution in order to preserve the quality of the products is a crucial since fresh produce usually needs to be stored chilled.
**Grocery Quality**

Maintaining product quality throughout the value chain is a big challenge, and currently many e-grocers do this by the expense of freezer and fridge systems, and dry ice which is put into grocery bags. For instance, ifoodbag is used by Mat.se, ICA and Coop in order to improve the cold chain by isolating the chilled and frozen products.

The content of the grocery bags cannot be faulty, even though mistakes are made by consumers in that they might choose ripped vegetables or short expiration dates, there is no room for e-grocers to do that. The consumers have put all their trust into the e-grocer to pick good quality products (e.g. fresh fruits and vegetables) and long expiration dates for packaged food. Therefore e-grocers have to meet these expectations when taking over the responsibility to pick, pack and deliver. This is a new and challenging part of the distribution for e-grocers.

> “Although, people do tend to favour longer shelf life products, they like to buy their own fruit and vegetables, because they don’t trust the pickers to pick the stuff with the best sell by date”

For traditional grocery stores the process of placing products and fresh produce in shelves has become a standardized routine, and suppliers have adapted their products accordingly to the physical store space. Further, traditional grocers always place the best expiration dates (e.g. dairy products) at the back end of the shelves so that the shorter expiration dates are bought. It is a strategy e-grocers cannot go by. E-grocers have new routines and procedures such as controlling that the back-end fulfilment centre’s environment and making sure that it has the perfect conditions (e.g. temperature) for fresh produce, frozen products and ambient products. Furthermore they need to check the quality of each fresh product several times before delivery.

> “Things that are inedible are thrown away (mouldy) but if it’s a bit soft, sometimes it is so that the avocado is great but it is too soft to send out because we know that it will be smashed during transport”

The consumer experience is important and e-grocers need to be aware of every aspect that affects how consumers perceive home deliveries. The ripeness of fruits and vegetables must be of good quality and the promise of the durability dates must be met. Further, innovative solutions that eliminate the need of freezers and fridges will open up new opportunities according to e-grocers.

**Communicate freshness**

Freshness is connected to people’s emotions and senses; it is felt, smelt and tasted. Therefore one main challenge has been to communicate freshness on digital platforms (e.g. websites, social media). E-grocers try to use compelling images and descriptions as a way of communicating freshness and promoting their assortment but it is not sufficient enough.

> “We try to post things on Facebook occasionally, I’ve posted pictures and written; we have this mango today, and; look what lovely cherry tomatoes we have today. It’s hard to put a metrics on freshness.”

The marketing is mainly about communicating that the products are of high quality and that consumers will receive fresh products in a convenient matter. Since the growth of e-commerce of groceries has started to kick off in recent years, e-grocers are still facing a challenge in convincing consumers that this type of service is reliable. Consumers are cautious and have old habits of having to see and touch a product in a store before buying it. This leads to consumers having higher threshold to buy groceries online. According to the e-grocers, word of mouth is a great marketing strategy. People who have tried the service and have had a good experience have
a big impact on others who are doubtful about buying groceries online. With that being said, e-grocers still need to constantly deliver what they promise and create a loyal consumer base with high retention in order to become profitable. This means that e-grocers should create new marketing strategies and also sustain a high standard of quality for the products, and always deliver good quality of fresh products.

“The problem is, as e-commerce business grows we’ve got to find a way of giving customers confidence in fresh food in general. I think that the way you look at Lidl & Aldi and the way they market fresh foods you do see people that are shopping online but then going to convenience shops for fresh foods. We’ve got to do something to address that situation I guess but how, I’m not entirely sure.”

5.2.2 Flexibility

Consumers have hectic lifestyles and they have high demands on receiving orders whenever and wherever they need it. In best case scenario the consumer should not even have to worry about deliveries, it should just fit into their lives smoothly. Consumers are becoming more demanding and it requires a flexibility that e-grocers are struggling to provide currently.

On-demand deliveries

Online grocery shopping requires planning, and last minute shopping is not possible in the same sense as in traditional grocery stores. Currently a competitive advantage is to have same day deliveries, which in itself is challenging for e-grocers. This puts pressure on e-grocers to develop flexibility in their supply chain and shorten lead times. It is expressed by e-grocers that the biggest competitor is the convenience stores in which consumers easily have access to buy grocery items. E-grocers are therefore facing the challenge to provide the same flexibility, to take smaller order sizes, i.e. less items, and provide faster deliveries. The complexity of deliveries is due to tight time slots and the required flexibility to meet consumer demand.

It has been mentioned by e-grocers that once an innovative solution that secures the cold-chain arrives, without the need of freezer and fridge systems, it will open up new opportunities for delivery models. The buzz amongst retailers is how to do unattended deliveries without risking damaged products and poor quality. E-grocers can become more flexible in the sense that they might be able to deliver via standard parcel networks thus reducing the need of climate-controlled trucks. This is due to e-grocers wanting to meet the need of every consumer, for example it might happen that a consumer firstly would like next day delivery or even same-day delivery but the time-clots does not match with their schedule. It further reduces certain disturbances such as consumers not being at home when the delivery man is at the doorstep but having the possibility to drop it of anyway. This leads to the delivery man avoids taking back the order.

“Delivery slots could be more flexible if the consumer does not have to be home to receive the order”

“Interesting solutions that would allow doorstep dropping, then you would not have to worry about the temperature. I think it is an area where people will get more into.”

Further, the last-mile distribution is a challenging part of the logistics because of the precision that is required both regarding time slots and order fulfilments; a lot of factors have to make sure that the right order is delivered on time. Products have to be in stock, the quality has to be checked several times (especially for fruits and vegetables), and traffic has to be considered
in the time calculations. The more consumers that order from the same area the better for the efficiency of deliveries, since that means using the most out of one delivery route.

Moreover, geographical location is another challenge e-grocers are seeking solutions for in order to be able to distribute further away from their back-end fulfilment centres. This will enable, reaching out to consumers that are not currently within their reach. And becoming independent of temperature control would make long distributions a possibility.

"With smart solutions, like Ifoodbag, we could discover new distribution models and opportunities to deliver with regular vehicles without freezer and fridge systems, delivery products from Gothenburg to Haparanda if we like to and so on. More flexibility in our distribution and new opportunities could be discovered"

Moreover, another key area that e-grocers want to achieve is anticipatory deliveries, meaning that they want to be able to predict what consumer will order beforehand, hence creating a more convenient service. But this cannot be achieved today since the technology has not reached that level; the service requires information about consumer’s shopping history and background descriptions about lifestyle, daily schedule, and other routines that will affect the deliveries.

**Suppliers**

At MatHem and Mat.se consumers usually have until midnight to place their orders in order to receive it the next day. Therefore e-grocers place their orders (e.g. dairy, fresh produce) to suppliers after midnight and receive it during the night, which is required in order to deliver with the promised food quality and expiration dates. This leads to the need of having suppliers that are flexible and provide shorter lead times for their deliveries. E-grocers replenish only when the consumers are placing their orders, which leads to the need of higher flexibility from suppliers.

It was expressed that the wholesalers are preferable for two reasons, firstly being that they have same day delivery and secondly being they can order the right amount of quantity needed. It is a challenge to work closely with producers since they have different requirements that is not always beneficial for the e-grocers and adding in extra work on their part. For example, producers have a minimum amount of quantity to be ordered, which cannot be met by e-grocers since they do not have the sales volume for that. Further, producers have a delivery time of 3-4 days since they have their own freight company.

"The collaboration is very good with Dagab (wholesaler), the benefit is that we have everything on the same lists, we order everything from the same website and we do not have to call all suppliers. With smaller suppliers it is more job required [...]"

Wholesalers are good for retailers when they need to have everyday replenishments without having to deal with many individual suppliers on the other hand the wholesales is just an intermediary, therefore a gap is created between the retailer and the suppliers, which is less desired when specific information about products are required (for the web store) or if there are complaints about a product batch.

**5.2.3 Collaborations**

E-grocers have a different business model compared to traditional grocery and one that is more complex to manage. There is the sales channel being the website that has various functions to fulfill such as creating a seamless experience of shopping, portray sufficient product information
and so on. There is also the back-end fulfillment centers that have several crucial touch point that
needs to be matched in order deliver the grocery orders. Lastly, there is the last-mile distribution
in which the cold-chain distribution needs to be sustained. Packaging solutions have been one of
the factors that have been mentioned for optimizing the process of picking and packing and
further to secure the cold-chain distribution among others. All of this could be achieved by
having close collaboration with suppliers.

Packaging requirements
E-grocers have expressed that special and innovative packaging solutions would be interesting
for e-commerce of grocery. The data collection suggest that e-grocers need packages that are
easy to handle during picking and packing, and many e-grocers state that light weight, damage
proof and square shaped packages are good for the e-commerce process. Packaging requirements
for e-commerce of groceries is an area that needs the attention from food producers and also the
processing and packaging solution providers in order to enable these changes that e-grocers are
demanding.

“Shipping and delivery could be entirely different if Tetra Pak, suppliers, and the
packaging industry can ensure that grocery products are safe from damages and retain
quality during distribution.”

“There is a lot to do regarding packaging innovations, we need packages that are easy to
handle our picking and packing without destroying the products, it should be stable and
maybe be picked by robots (in the future), barcodes should be visible and properly
positioned, and everything should be considered”

Moreover packages that can protect groceries from external factors such as temperature and
shocks are asked for. For example if groceries were protected from high temperatures and shocks
they could basically be shipped from one end of Sweden to the other by traditional postal
services. However it is important not to forget that the packaging still has to be accepted and
liked by the consumers. When the home becomes the place where consumers first will interact
with the groceries an in-home experience will matter. In-home experience requires customization
and personalization, which in turn means that the e-grocer needs to be flexible in product range
and offerings. The in-home experience includes cooking and a problem when packing according
to recipes is for instant the sizes of packages, the size does not always match the amount needed
for the recipes. For example a single person household may prefer smaller packages adapted to
one-person meal.

Kitchen is the new arena for marketing and packaging. From marketing point of view the
products should promote sales in the homes of the consumer. The kitchen is where the consumer
first interacts with the groceries, the first impression is important. When consumers perceive the
grocery bag as going beyond expectations they will firstly use the service again and secondly
recommend it to their peers. Replenishing a product has to be easy and effortless for the
consumer. Amazons echo is an example of a solution which allows Amazon to reach the
consumer in the home.

“So when they look in the cupboard, so your now sort of managing the kitchen almost the
same as a sales environment”

More about the packaging requirements will be discussed in section 4.3 where the packaging
system for e-grocery is described.

In order to meet the requirements for packaging solutions, close collaboration is needed with
upstream stakeholder. E-grocers have expressed that starting collaboration with suppliers is not
easy but it would mean better solutions for the operation. Further, it has been expressed that collaboration with small suppliers such as fish suppliers are more flexible to adjust to the requirements e-grocers have. By establishing collaborations between e-grocers and involved stakeholders, especially food producers, new innovative solutions could take place and the e-grocers could increase the operational efficiency. Collaborations would benefit both the e-grocers and producers since the aim is in the end to increase sales and providing a better service to end-consumers.

**E-grocery Infrastructure**

The infrastructure of an e-grocer is complex and not managed easily, the logistics in the back-end fulfilment has to work with the delivery transportation and the supply chain has to be managed. A lot of factors need to be matched and work cohesively, such as placements, picking strategies, packing grocery bags, loading of trucks etc. Both pure e-grocers and brick-and-clicks (B&C) face challenges regarding the back-end fulfilment centres. On the one hand B&C have a hard time to integrate the new processes into their existing infrastructure. They have to make sure that the e-grocery operations do not cannibalize or decreasing the efficiency of current operations. On the other hand the pure online e-grocers are struggling to build a new efficient infrastructure. They need to manage a new supply chain and create an infrastructure for handling of orders and deliveries. Pure e-grocers seem to be more open minded to discover new solutions if it can help them save time and money.

> “The game is finding how you get both channels [online and offline] working for each other. The most valuable customer is a multi-channel customer, not a single channel. Yes, it will make the market noisy but if you can bounce the two channels together you can end up with a higher footprint than you started with”

Further, one new system to handle is the marketing aspect; e-grocers need to put time and effort into creating an appealing product descriptions and presentation. It is nearly impossible to put that much emphasis for each product, so it would be a win-win situation if the suppliers started to care more about their marketing on the retailer’s platform. At Mat.se it was expressed that a solution like creating an open source would give a more efficient access of adding information needed such as the origin of the product, its content, information etc. E-grocery is creating transparency that was not available before, leading to consumers having a better basis to choose products wisely.

![Collaboration Diagram](image.png)

*Figure 5.8 Correlation between collaboration, quality and flexibility in e-grocery*
Figure 5.8 indicates the correlation between quality, flexibility and collaboration. The full line indicates that collaboration has an influence on both quality and flexibility. By having a close collaboration with food producers, e-grocers are able to obtain higher flexibility and quality of the service. E-grocers are able to create new solutions together in regards of shorter lead times, smart grocery bag systems, and primary packages for e-commerce, and securing the cold-chain distribution. Further, once the flexibility is acquired in which e-grocers want to achieve it will have an effect on the quality control. For example the handling of fresh produce and expiration dates would not be a sensitive touch point for e-grocers

5.3 Packaging System for E-grocery

The packaging system throughout the value chain in e-grocery has another role if compared with traditional grocery. The following text will elaborate further on the implications e-grocery have on the packaging system and how the packaging levels changes throughout the different stages of the e-grocery value chain.

5.3.1 Primary Packaging

Ordering

From the consumer perspective the product is influenced by the packaging design and its promotion through information and graphics on the packaging. When the consumer is looking at a product through the screen instead of seeing it on the shelf, the primary package will get an entirely new meaning. Since the physical interaction with products is removed at point of sale the product and content presentation on the website becomes a crucial touch point instead of the primary packaging itself. Furthermore, there is a difference in how a product is displayed on a shelf where space is limited; the product has to win attention from other distractions in the store. The primary package does not have the same central role during the purchase online since content descriptions and images are what the consumer will interact with. When ordering online consumers can choose to order based on recipes, and a problem that arises is that the packaging sizes are often not adjusted to the recipes or the amount of portions that the consumer wants to order. Therefore, there is a need to have recipe adjusted or portion sized packages for e-groceries.

Back-end fulfilment

Primary packages of square shape, which are easy to pack and stackable, are preferred by the e-grocery staff. This is because they can pack the products like a puzzle, with a logical sequence. When e-grocers are packing groceries the heavy and stable products are placed in the bottom and the lighter and sensitive products on the top, which becomes a bit complicated when a product is heavy but has a sensitive packaging. For example minced meat is usually packed in overwrapped trays (see fig. 5.9), and these packages have high risk of leakage if they are packed sideways into the grocery bag. The minced meat is sometimes heavier than some sensitive products such as fruits and vegetables, so when packing these together the packers face a dilemma; should the minced meat be placed below the fruits and vegetables and risk to leak, or above and risk crushing the other products? In regards of minced meat there is a package that has been stated to be more suitable for e-commerce of grocery, the “tube”-shaped package is leaner and has a better seal that does not leak, see figure 5.9.

Another issue for the e-grocer is to have products with at least five days of durability until the expiration date (e.g. MatHem and Mat.se), and the tube package for minced meat allows up to 21 days of refrigerator shelf life (Cargillgroundbeef, 2016).
Figure 5.9: The overwrapped tray and tube for minced meat (source: Cargillgroundbeef.com)

**Last Mile**

During transportation the primary packages should be protected by the secondary package and tertiary packages, i.e. the grocery bags and crates, however vibrations and shocks can cause damages and leaks which can destroy an entire grocery bag from within. Thereof it is important that the primary packages are robust enough and is steadily sealed. The packages should be able to take some shocks without breaking.

Currently the priorities for the last mile include securing the cold chain in one way or another, this leads to the need of innovative solution in which the primary packages can play a significant role. The primary package has the potential to protect the product from external temperature shifts and secure the quality of a product during the last mile distribution.

The consumer will have its first interaction with the product when receiving the order, so the in-home experience with the primary package will shape the first impression of a product. Unpacking the grocery bag and seeing the products will give the first impression which could be what promotes sales and makes a replenishment take place later on. Furthermore primary packages that today are adapted to shelves in store should be reconsidered into packages for shelves in the kitchen, the kitchen is a new marketing place for products and whatever is more convenient and user friendly within the kitchen will probably be replenished again by the consumer.

**5.3.2 Secondary Packaging**

**Back-end fulfilment**

The “shelf ready” packages that are used in traditional stores have no longer a purpose in the warehouse for e-grocers. These do not have to promote sales as in a store-shelf when used by e-grocers and for some e-grocers the secondary packaging only means extra work to get them off. Secondary packages in form of grocery bags or boxes for packing are more important for e-commerce operations, see figure 5.10. The challenge is that these secondary packages are packed with different product categories, meaning that the content has different shapes, sizes and weights. The groceries should all be protected by grocery bags, but also from damaging each other within the package. Further the grocery bags should also be adapted to different temperatures such as ambient, chilled and frozen products in order to retain the temperatures. The secondary packaging needs a design that can make the packing process more convenient. For example by having the right dimensions that can fit different products or having different compartments that can separate products with different sizes, weights, and temperature requirements.
Figure 5.10: Paper bags, boxes or plastic bags are usually used for e-commerce of groceries. (Source: (1) Matkasse.nu, (2) coop.se, & (3) accountingweb.co.uk)

Furthermore, another issue that pickers are experiencing is the fact that the grocery bags quickly become heavy. It leads to more usage of grocery bags in order to prevent too heavy bags that could break.

“When I have picked the bags, I think weight is the problem not space, the bags become very heavy and you have to take a new one.”

Last Mile
During the last mile, when grocery orders are being delivered it becomes important to protect the grocery bags which are placed into crates and once they are on the road the grocery items need to remain in good shape and high quality. Therefore grocery bags have to protect the groceries from both shocks and high temperatures.

Moreover different solutions to secure the cold chain will allow new opportunities for the last-mile, and one example of a secondary packaging that attempts to secure the cold chain is iFoodbag (fig. 5.11). This is a bag with an isolating effect on frozen and cold groceries. Other examples of secondary packages that have been used to secure the cold chain are Styrofoam boxes with ice packs or entire freezer compartments in trucks.

Figure 5.11: Ifoodbag (Source: Livsmedelshandlarna.se)

When the order reaches the consumer’s home there are ways of helping with the unpacking process, for instance helping consumers to identify what different bags contain. Ocado for example has different colours on their grocery bags as indicators of ambient, chilled or frozen (fig. 5.10). However consumers that are aware of environmental sustainability do not like the
fact that too many grocery bags are used for deliveries, so having environmental friendly secondary packaging would be a better solution from a consumer perspective and for sustainability. Environmental friendly could for example be reduced use of packaging material or reusable packaging material.

### 5.3.3 Tertiary Packaging

#### Back-end fulfilment

Tertiary packaging is usually referred to as pallets, and depending on what type of good that arrive it needs to be packed in such way that makes the handling of those good efficient in back-end fulfillments. Therefore it is important that suppliers section these goods in a logical order, for example certain goods should not be mixed together (e.g. chilled and frozen). It is also essential to clearly mark pallets with article numbers, product weights, and expiration dates to make the process more efficient. Having pick-ready pallets will eliminate the need of having secondary packaging (shelf-ready), which are currently causing a waste of time for e-grocers who need to remove these packages.

#### Last Mile

For last-mile distribution the secondary packages are placed into crates, which act as support for grocery bags. The crates are in this case the tertiary packaging and work as protection from shocks and make it possible to stack orders in the trucks and also keep track of all orders. The secondary packaging (grocery bags) sizes are usually adapted to fit into standard crates so the same concept works here as for Europe pallets where secondary and primary packages are adapted to those.

The truck drivers need to identify the right crate when the destination has been reached; hence clear labels are necessary on the crate. Furthermore when the truck-drivers are delivering the groceries they usually use the crates all the way to the delivery point. The crates are usually carried (see fig 5.12) and stacked on top of each other if more than one is used.

> “I think, finally from a pack sized point of view, one of the biggest issues we have with our drivers is the weight.”

For the last meters of the last mile the crates should be ergonomic in order to avoid work-injuries for the truck-drivers.

![Figure 5.12. Truck driver carrying the crates for delivery (source: Mat.se)](image)

### 5.4 Technological Trends

Technological trends were analyzed in order to understand what technologies that are emerging or entering the market. This will further provide with insight into what inefficiencies in the value chain is being optimized and how it might change the market.
5.4.1 Internet of things (IoT)

**Definition:** the Internet of Things (IoT) is a term used to describe the development of machines, vehicles, goods, households, and appliances among others to be equipped with small built-in sensors and computers. This enables the creation of smart and a helping environment with goods and services by perceiving their surroundings, communicate with it and also create a situational behaviour (Vinnova, 2016). The IoT is still in the very early stages of implementation but it will probably reflect the same penetration growth of other recent digital technology revolutions like the Internet, mobile technology and social media (Gregory, 2015).

**Business impact:** By starting to increase the connectivity with devices and add more intelligence will not only change how consumers live, work and play but also reshaping entire industries. With the evermore amount of data that companies get hold of through the IoT is providing them the opportunity to leverage their operation (Gregory, 2015). By 2020 it is estimated that over 50 million objects will be connected to the Internet, which will provide opportunities in logistics and consumer knowledge (Vinnova, 2016).

In the warehouse, IoT have a lot of areas to be connected with such as cranes and robotics. Furthermore it is able to provide data and track driver performance from, including route optimization and operational improvements (wheel speed, tire pressure, road speed, engine revs, fuel consumption, and cornering performance) and those parameters are directly shown in real-time for the company. Ocado is utilizing such a function for their driver performance. Moreover, wearables in the warehouse are seen as a potential resource for Ocado, which will help them with improving safety and productivity.

The biggest impact IoT can have in food retail is the consumer element in which it is underestimated (Ocado, 2016; Accenture strategy, 2015). The connected consumer together with smart products and home appliances will create new concepts such as automatic replenishment service, e.g. a smart fridge triggering grocery orders, smart locks that enable secured in-home delivery. The interaction of IoT and smart machines can lead to smart homes, smart appliances, and smart packaging, and it is seen as a very relevant aspect to consider for Ocado (Clarke, 2016). Furthermore, Ocado see that the demand for smartness from all the system is going to rise by consumers, leading to new heights with mobile apps and services they build (Lawson, 2015).

**Maturity:** Reaching plateau of productivity in 5-10 years (Gartner Hype Cycle)

5.4.2 Big data

**Definition:** big data is defined by Gartner “as high volume, velocity and variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision-making.” (Gartner, 2016)

**Business impact:** big data makes it possible for companies to better understand customers’ shopping behavior and yield a better and faster decision making in everyday business. Decisions such as product variation, range, pricing, promotions and retailer-supplier negotiations are getting much simpler and reduce time spent analyzing consumer behavior (McKinsey & Company, 2013). Furthermore, for online grocery retailers observing the consumer shopping behavior yields information about how they put together their shopping baskets, crucial touch points/factors that help them to make the final purchasing decision and what alternatives they look into when considering buying a product (McKinsey & Company, 2013).
Enhanced consumer experience will be possible by leveraging big data that will indicate consumer interactions and operational performances. Furthermore it will enable specific consumer segmentation and also targeting and tailoring service levels. Sentiment analytics can be applied in order to proactively maintain customer loyalty and retention.

**Maturity:** Reached the plateau of productivity (Gartner Hype Cycle)

### 5.4.3 Augmented reality

**Definition:** By providing computer-generated sensory such as sound, video, and graphics data, it is possible to create a live view of a physical, real-world environment, called augmented reality (AR). Compared with virtual reality, which replaces the real world with a simulated one, AR is seen as a technology that adds information about the surroundings.

**Business impact:** AG-powered warehouse operations could be utilized in various ways in order to optimize and make it efficient. Smart glasses for hands free operation such as product picking, sorting. Currently smart glasses are able to display task information, scan barcodes and support navigation indoors. Smart glasses can also be embedded into warehouse management systems for real time operations (DHL, 2016). Furthermore, Smart glasses can be utilized for intelligent last-mile operations. Workers equipped with smart glasses can conduct completeness checks of each shipment using object-recognition technology. AR can also be used to virtually highlight inside a vehicle the optimal loading sequence of each shipment (taking account of route, weight, fragility, etc.). On delivery, AR can be used for last-meter navigation to correctly locate entrances (DHL, 2016). AR could also be used as an ordering tool, for example Tesco has already launched an application for Google’s glass eyewear that allows consumers to place order through a speaking command and scanning barcodes (The Guardian, 2015)

**Maturity:** Reaching plateau of productivity in 5-10 years (Gartner Hype cycle)

### 5.4.4 Autonomous car

**Definition:** Autonomous cars, also called self driving vehicles or robotic cars entail the capabilities a car has in order to drive without human input. It is possible due to its ability to sense its surroundings by radar or GPS. It provides an efficient way of planning a path to the desired destination by analyzing sensory data that makes the vehicle aware of the cars on the road.

**Business impact:** The autonomous logistics is on the rise and has been creating a large amount of buzz in the media in recent years. Self driving vehicles are reaching a level of maturity for commercial use in warehouse operations such as Linde and Balyo that is being deployed and it is unlocking new levels of process efficiency and performance in the warehouse. Self-driving cars for public use has not reached the maturity for commercial use yet, mostly due to legal issues. Nevertheless when it will provide new opportunities and add value for online grocery retailers with the possibility to not only reduce manpower but also provide with a new perspective on time slots and routes for delivery services (e.g. starship). This will enable online grocery retailers to gain more flexibility and efficiency (DHL, 2016).

**Maturity:** Reaching plateau of productivity in 5-10 years (Gartner Hype Cycle)
5.4.5 Virtual reality

**Definition:** Virtual reality (AR) replaces the real world with a simulated one either real or imagined and allow for user interaction.

**Business impact:** Virtual reality is mainly used for entertainment but it is starting to go beyond that, such as businesses providing in-store experiences. Moreover, 66% of UK consumers are seeing great potential for it to change their lives for the better but there is also a concern among consumers, that VR might have a negative impact on social interaction.

With the headsets becoming more prevalent, customers’ expectation will increase and a better use of such a technology will grow across all sectors. It will provide customers to envision their products in their homes and more brands offer apps that like Nescafé 360° that provides the viewers with the brand’s farmland so that is can be transparent of its sustainable credentials. Furthermore, in online grocery there is an app called My3DStore, which is replicating the real shopping experience for traditional grocery in an online environment. The consumers are able to experience fully stocked aisles of products and it is even said that the entire virtual store is based around the consumer. Navigations around the store are possible by category.

**Maturity:** Reaching plateau of productivity in 5-10 years (Gartner Hype Cycle)

5.4.6 Machine learning

**Definition:** Machine learning is referred to data analysis that uses algorithms that iteratively learn from data. This enables automatic analysis in which computers find hidden insights.

**Business impact:** Machine learning is getting evermore advanced and known areas for its application is self-driving car (is described in its own section below), online recommendations provided by for example Amazon and Netflix or finding out what customers are saying about a certain brand etc. (SAS, 2016). Ocado (UK’s biggest pure e-grocer) believes that two genuine technologies are heading our way, namely the Internet of Things and Smart Machines. The technologies when collide with one another will enable with new opportunities in various industries such as entertainment, healthcare and smart cities (Clarke, 2015). Ocado’s ambition is to be able to predict what their customers want before they know it themselves by deep learning of processing all the data Ocado collects. Furthermore, they will need to integrate with their customer’s increasingly smart worlds and one way to do so is by smart packaging. Smart packaging could provide with smart labels that interact with you, warning you that the product might trigger allergy you have. Smart packaging will be able to interact with smart tools that will be part of a smart home. Furthermore, Ocado envision that “smart homes, smart offices and smart communities will be part of smart cities and smart countries (Clarke, 2015).

**Maturity:** Reaching plateau of productivity in 2-5 years (Gartner Hype Cycle)
**5.4.7 Ventures**

**Back-end fulfillment**

In Sweden since the back-end fulfillment centers are mainly managed manually. The process and the activities are rather simple compared with an automated back-end fulfillment center. Navigation through the back-end fulfillment center, in which the order picker receives information on what order to handle and what grocery items to be picked and packed and where they are located are executed with the help of headphones, called Pick by Voice and also by a tablet.

Furthermore, in Sweden there are data system services in which e-grocers are able to take hold of all the product information needed or rather those information that is stored. Down below in table 5.2 are short descriptions of each data system provider, the information is taken from their irrespective website.

<table>
<thead>
<tr>
<th>Data systems services</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dabas</strong></td>
<td>Sweden’s largest database for articles in the food service industry and suppliers are able to access quality assured information available in the Swedish grocery market</td>
</tr>
<tr>
<td><strong>Valido</strong></td>
<td>Sweden’s leading site for image and product in which they offer a service that manages, store, and deliver information of various products for all industries.</td>
</tr>
<tr>
<td><strong>OPV Online</strong></td>
<td>Offers suppliers in the food service and pharmacy market a service on accurate digital product and image information. The suppliers are able to access internal or external system in order to fill in article information which then Valido controls, take images, store and distribute the information’s</td>
</tr>
</tbody>
</table>

*Table 5.2: Data systems for product information and image*
Moreover, the route optimization is also offered by a third party for Swedish e-grocers. This is the efficiency of having a company providing the type of service. E-grocers always aim to have an optimized route distribution and make sure that the deliveries are done in a sustainable manner. DPS the world leading when it comes to route planning and the service include advanced planning and optimization of transportation.

**Smart Homes**

Amazon is in the lines of creating an integrated home firstly with their Amazon Echo, which is a speaker that provides with various services and one of them including for the kitchen. Amazon echo in the kitchen enables adding groceries to the shopping list by asking it and further it can provide with recipe inspiration and knowledge about food such as calories (Alba, 2016).

Secondly, with their Amazon Dash button that launched in 2015, allowed consumers to reorder a product and by pushing the button it automatically add the items into Amazon basket. But it has been developed further and it is more sophisticated in that it can be programmed “to count items, start or stop a task, call or message a contact, or order a service” (Krasniansky, 2016). Furthermore, the Dash button is also coordinated with Facebook, Twitter among other platforms in which users are able to for example hail an Uber. Amazon Dash button is running by Amazon’s AWS cloud system (Krasniansky, 2016).

Tesco launched their Grocery Glassware early in 2015 in which consumers are able to browse Tesco products, look for information on nutrition and further add grocery into the basket. The Grocery Glassware is connected with Tesco app and it was stated by Pablo Coberly, Innovation Engineer at Tesco Labs, that the Glass is not means to replace other devices rather the function is more immediate (Clarke, 2015). Solution in lines with those like Amazon and Tesco indicates that IoT things is taking hold and becomes redundant (Clarke, 2015)

In Sweden ICA came out with their intended collaboration with Postnord and Glue that they are now are able to delivery directly to the fridge. Home access system enables the delivery man to unlock the front door and deliver directly to the fridge. This type of solution has it advantage that it creates flexibility of unattended home delivery (Billing, 2016).

Furthermore, Ocado mentions a lot about smart homes in which smart kitchens enables smart cupboards and connected pantry in which it enables auto orders of basic grocery items (Lawson, 2016). Further, Ocado is launched an Apple watch application (wearable technology) which has integrated grocery services appliances (Mintel, 2016). Mastercard have also enabled grocery ordering via their application connected to Samsung fridges. With RFDI it is possible to provide with inventory management as well as tracking the item throughout the supply chain.

**Radio Frequency Data Identification (RFDI):** enables inventory tracking and as well as tracking it throughout the supply chain with the microchip that is installed into the packing as opposed to barcodes that are printed on the packaging.

Furthermore, there are other digital identifiers include digital watermarking (DW), disposable smart labels, and low-cost biometrics. To achieve complete transparency and traceability becomes more and more tangible and for e-grocers to be able have this type of control will yield greater insight into what is happening throughout the supply chain. For example they will be able to put identity to every grocery bag and trace its location, perhaps even deliver additional security information. All products can be identifiable, traceable and locatable with digital identifiers such as invisible barcode and Near Field Communication (NFC). These smart labels
provide information about the specific products such as expiration dates, time and place of producing the products etc. (DHL, 2016).

**Last Mile**

**Starship**

Starship is described as an autonomous parcel delivery in which it is able to deliver multiple parcels within 5 km (3 mile) radius. It is a smart robot that drives on sidewalks at pedestrian speed and is able to “detect obstacles, adjusts speed/stops, and safely crosses streets” (DHL, 2016). Furthermore, it requires a special code to open up the lid and a video camera as well as GPS is installed in the Starship to reduce risks such as theft. It is stated that it can potentially be 5-10 times cheaper for local deliveries (DHL, 2016). The co-founders of Skype did launch Starship Technologies in which their aim is to make local delivery free. Starship delivers goods and groceries and doing so with no CO2 emissions. Further, their vision “revolves around three zeroes – zero cost, zero waiting time and zero environmental impact. We want to do to local deliveries what Skype did to telecommunications.” expressed Ahti Heinla, a Skype co-founder and CEO at Starship Technologies (Starship, 2016)

**Drone delivery**

Amazon wants to offer its customers delivery within 30 minutes by using unmanned aerial vehicles (package delivery by drones, not for groceries). This type of solution has mixed reviews but it is said that this could be a viable solutions. Google is also experimenting with drone delivery (Amazon Prime Air, 2016).

**iFoodbag**

iFoodbag is a Swedish start-up that has entered the packaging industry since 2013 in which they offer a packaging solution consisting of composite material that is said to protect chilled and frozen food up to 24 hours. Moreover, it is stated to solve the following problems

- “E-commerce logistics challenge: costs and product quality
- Improved quality for chilled and frozen items
- Environmental waste” (iFoodbag, 2016)

They have partnered up with stakeholders like Mat.se, ICA and Coop among others in order to deliver with in new ways to the consumers. It is said to be cost-effective and simpler to deliver to consumers (iFoodbag, 2016).

**Instacart**

Instacart is a service based in the US, in which they use crowd sourced shoppers that are willing to shop groceries for customers from various grocery chains in exchange for a fee. With Smartphone’s consumers are able to send out a request for grocery shopping and within two hours someone is picking the groceries and delivers at the agreed destination. Instacart business model is based on speed, variety and convenience with a unique trade-off (Balestier, 2016). This type of business model is a niche offer that are targeted and limited to high-income individuals thus not impacting the fundamental challenges in last mile operations. Furthermore, Instacart became number one company in 2015 on Forbes America’s Most Promising Companies list and was valued more than $2 billion (Solomon, 2015).

**Urb-it**
Urb-it is a service in which a consumer can choose to shop from home or wherever within Stockholm city (currently) and then have it delivered to a location by a so called urber. An urber can be anybody willing to make these errands and an education is provided before starting to work and the urber can choose how to deliver, it could be either by walk, bicycle or use of public transport (Urb-it, 2016). Urb-it is plans on expanding and this type of business model is beneficial for the higher-income residents and the ones that are living an hectic lifestyle not finding time to make small errands or last minute shopping. It worth to emphasize that currently they do not provide grocery shopping but it was stated that it could be a possibility in the future.

**Google Express**

Google Express is a shopping service from Google in which consumers are able to shop at stores like Target and Costco and get same-day delivery or overnight delivery. They are partnering with grocery chains wherein the orders are picked in the store and delivered by a driver in Google Express vehicles (Google Express, 2016).
6 ANALYSIS

In this chapter the connections are tied up from previous chapters. The empirical data is further analysed and discussed closely.

6.1 Implications on the processing and packaging industry

In section 5.1, e-grocery was compared to traditional grocery, and by analyzing the differences it is interesting to understand how the processing and packaging industry might be influenced.

<table>
<thead>
<tr>
<th>From: Traditional business models</th>
<th>To: Complex business models</th>
<th>Possibilities to develop packaging that enable traceability and transparency thus enabling consumers to make wiser decisions.</th>
</tr>
</thead>
</table>

In a transparent market traceability will be a feature that could be used both by consumers and by e-grocers to see where products are transported from, currently are, or will be transported to. In this area a packaging and processing company could develop packages that are traceable. For example RFID, QR codes, picture recognition or barcodes could inform consumers about a products origin, provide with handling history, and links to online promotions and loyalty programs. E-grocers could also offer value added services such as displaying the carbon footprint of the products thus helping the consumer to make wiser decisions when choosing grocery products.

<table>
<thead>
<tr>
<th>From: Shelf display</th>
<th>To: Personalized online interface</th>
<th>Personalized packaging design based on big data about consumer preferences, shopping habits etc.</th>
</tr>
</thead>
</table>

The online environment, i.e. the website for e-grocers, could mean new design parameters to consider for packaging design. The primary packaging plays a huge role in traditional grocery stores; it acts as a marketing tool to trigger purchases. But online environment creates other ways of analyzing the consumers, the development of machine learning in which devices are able to smartly provide consumers with a personalized service. Packaging design parameters could look entirely different in an online shopping environment compared to an in-store layout (planogram). If the website is adapted to each consumer based on preferences maybe the packages also could be personalized when they reach the consumer? This is something that is in the future more than now since the personalization currently is only about getting suggestions of products. However e-grocers have the potential of using augmented reality and combine it with big data to create a personalized and interactive shopping experience. For example it could mean that each consumer gets its own grocery store with a personalized theme, which could include that products are adapted to that theme and will have packages that match.

<table>
<thead>
<tr>
<th>From: Limited shelf space</th>
<th>To: Unlimited shelf space</th>
<th>Recommendation to sales; do not forget the smaller and niche producers when searching for potential customers. New and niche producers will have the opportunity to grow more online than offline.</th>
</tr>
</thead>
</table>
When shelf space becomes more or less unlimited the smaller and new producers will get an equal chance to start selling their products through retailing. In digital environment, every brand, new or category leader possess the same amount of space on its page hence creating a platform in which smaller producers having the opportunity to stand out in a unique way such as telling a compelling story on the webpage. Therefore, digital marketing eliminate the importance of size in packaging, which is of importance in the traditional shelves in order to be visible. An increased number of retailers will have the opportunity to be displayed online and one can assume that the pace of new launches will increase online. One of the e-grocers stated “if the product is in stock we do not have anything that stops us from offering it to our customers online”. An opportunity could be to have producers who give away samples in order to test sell the products before conducting a final deal with the e-grocer. That would mean that the e-grocers could wait and see if there is a demand of a product before closing the deal with a supplier. E-grocers are keener to sell niche products, and online consumers will find the products easier through filters and personalized suggestions, also product samples could be sent with other order as a way of creating awareness. So based on the prediction that the niche producers will increase in number and sales, a suggestion for the packaging and processing industry is to recognize the opportunities to target these firms with processing and packaging solutions.

### From: Consumers taking responsibility

**To:** Retailers taking responsibility

**Back-end fulfilment and Last mile secured packaging:** The package distribution does not stop at the store shelf thus creating the demand for damage and temperature-proof packages that are easy to pick and pack.

Packaging design has previously been based on creating shelf impact, i.e. shelf ready secondary packaging and primary packaging accordingly. However for e-grocers the secondary packaging has no longer the same purpose when standing in a fulfilment centre, and when the products are placed in the grocery bags these will become the “new” secondary packaging. So the secondary packaging actually becomes the important packaging level during the last mile distribution and the primary packaging is almost anonymous until the consumer has unpacked the grocery bag. Packaging and processing manufacturers should consider how they design the primary and secondary packages, since the back-end fulfilment need solutions for easy picking and packing and the last mile need damage-proof packages. The switched responsibility of picking, packing and transporting groceries is placing pressure on e-grocers to deliver high quality products without any room for mistakes. When consumers no longer are in charge of the last mile, they will expect nothing but perfection from the e-grocers whom they have put their trust in. So securing the last mile through packaging is something that will have an impact on the processing and packaging industry. Since the primary packaging no longer is in the intended secondary and tertiary packaging it might be at risk to break or leak. If packages break, leak, or cause any kind of obstacle during the distribution it will most probably backfire on the packaging manufacturers. In worst case the e-grocers will exclude a product that is causing such problems from the assortment.

### From: In-store shopping and experience

**To:** In home shopping and experience

**Smart packages, which are suitable for easy replenishments.** Kitchen ready packaging is still an unexplored area that is relevant for e-commerce but also for a packaging and processing company.
When consumers no longer can buy groceries spontaneously they will either have to remember when it is time to place a new order or the order could be placed automatically. The latter could be done through smart packaging; imagine if the milk packaging could sense the milk and automatically communicate to an e-grocer when the milk is undrinkable or the package is almost empty. Consumers find traditional stores flexible since they can run back to a store in case they need to replenish a product, which was found to be very difficult for e-grocers to imitate. However if the e-grocers could obtain information through smart packaging, they would hypothetically be able to arrange an order before the consumer even is aware of the need.

Brand building becomes part of the in-home experience and the packaging and processing companies will have to understand what actually happens in the home. When consumers for example unpack, place products in the fridge, use the products for cooking, and consume the product, they experience different needs on product features. Some e-grocers already talk about “kitchen ready” packaging, but there is no given definition of what it is, the area has to be explored and understood first. But it has been mentioned in the context of groceries being pre-organized in boxes that can be directly placed in the fridge. And another aspect could be to have groceries prepared for cooking, so the right amount of different ingredients for a meal is clustered together. These are only speculations of what kitchen ready could be, however it seems like the packaging has to be adapted to the kitchen ready concept somehow. The kitchen ready packaging could be portion- or recipe-sized packages that can be configured with other ingredients.

| From: Procurements to stock | To: Procurements to order | Developing JIT systems that can start producing based on consumer orders |

When using e-commerce for grocery shopping the consumer make a purchase before getting access to the physical products. So in theory the products do not have to exist yet and the producers could produce to the order. Processing and packaging companies could provide with systems for just-in-time operations. Having a flexible system that can process and pack different products based on the consumer demand would allow a lean flow and decrease the need of stocks for the producers.

| From: Mono-channel | To: OMNI-channel | Solutions suited for both online and offline channels, Traditional grocery stores will co-exist with e-grocery hence it is important for brand owners to balance the two channels. |

Balancing two channels means having two different requirements on distribution. The traditional grocery value chain is known since before, and the e-grocery value chain is new, however both of them have to coexist in harmony. For brand owners this coexistence is important to consider in marketing and sales because usually products will be sold through both of the channels and the way consumers perceive the products should not differ. For instant the packaging design perceived online has to match what the consumer will receive. Packaging solutions that suits both channels, i.e. Omni-channel packaging, should be further investigated to find out how packaging for Omni-channels could be designed. It is crucial to offer a package that is perceived as being of the same quality and standard both online and offline, while at the same time taking
different packaging requirements into consideration when designing it. For instance if the packaging for e-commerce is changed to be more robust in order to handle the distribution, consumers should still be able to recognize the product when it is compared to the packages that are placed in traditional store shelves.

| From: Sustainability as a CSR | To: Sustainability as a source of cost competitiveness | Create flexibility for e-grocers and also reduce waste through processing and packaging of fresh produce. |

For many companies sustainability is part of the corporate social responsibility (CSR), including the traditional grocery retailers. E-grocers also have sustainability as part of their CSR however they also use it as a source of cost competitiveness. Being able to have almost no waste is a cost competitive advantage. But the attempts to have low (no) waste rate requires a faster supply chain with shorter lead-time between suppliers of fresh produce and the e-grocer. These requirements are necessary since fresh produce have to be fresh both when it is delivered to the consumers, and for several days afterwards. Processing and packaging is known to increase the shelf life of products, it makes products last longer and it makes ambient distribution possible. For that reason processed and packaged food is suitable for waste reduction. A process to package fruits and vegetables for longer sustainability would possibly be a competitive advantage.

### 6.2 Packaging decisions for Tetra Pak

The packaging system for e-commerce of groceries has been presented in the result chapter and will in this section be discussed in relation to the packaging and processing industry.

When studying the interacting packaging levels in a traditional retails supply chain by Hellström (2007), one can say that the logistics processes for the traditional grocery (i.e. receiving and shipping, and replenishing process) are directly affected by e-commerce, since this is where the processes have changed from store-based retail outlets to online retailing platform.

The functions of secondary packages, tertiary packages, and primary packages are changing and new requirements are emerging when moving from the traditional grocery value chain to the e-grocery value chain. The more e-grocers increase their sales volumes the more influence will they have in packaging matters. The e-grocers use grocery bags or boxes in order to cluster primary packages and send it to the consumer. Therefore the grocery bags/boxes has become the secondary packaging for e-grocers. The tertiary packaging level, which traditionally simplifies the process of transporting large amount of good, is for e-grocers represented by the crates that are used for transportation of grocery bags. The primary packaging is still an unexplored area in e-grocery, it plays a crucial role in the value chain since it is preserving and protecting the food product. Currently there is no recognized primary packaging that has consciously been adapted to e-commerce of groceries. However the authors have observed packages that are better suited and have found new requirements.
Comparing the schematic model of a supply chain for a generic packaged food product by Lindh (2016) it is seen that the e-grocers activities will change and distribution will be added as an extra box between the e-grocer and the consumer. This change was further analysed and the interactions between packaging levels and the e-grocer operations were described. The interacting packaging levels and the e-grocery operations are summarized in table 6.1.

<table>
<thead>
<tr>
<th></th>
<th>Ordering</th>
<th>Back-end fulfillment</th>
<th>Last Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Graphic design for online and offline display</td>
<td>Square shaped- stackable</td>
<td>Robust and Steady</td>
</tr>
<tr>
<td></td>
<td>Portion/recipe sized</td>
<td>Sealed properly- no leakage</td>
<td>Ambient distribution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the shelf life</td>
<td>Promote in-home sales</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kitchen ready (shelves, cooking, consumption)</td>
</tr>
<tr>
<td>Secondary</td>
<td>“Pick ready”</td>
<td>Pack-friendly</td>
<td>Protective from shocks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Separator for different</td>
<td>Temperature-proof</td>
</tr>
<tr>
<td></td>
<td></td>
<td>temperatures</td>
<td>Unpacking efficiency</td>
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<tr>
<td></td>
<td></td>
<td>Robust</td>
<td>(identification of content)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Environmental friendly</td>
</tr>
<tr>
<td>Tertiary</td>
<td>Pallets:</td>
<td>Pick ready</td>
<td>Crates:</td>
</tr>
<tr>
<td></td>
<td>Pick ready</td>
<td>Informative</td>
<td>Protection</td>
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<tr>
<td></td>
<td>Informative</td>
<td>Stable</td>
<td>Stackable</td>
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<td></td>
<td>Standardized</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Informative (for deliveryman)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ergonomic (for deliveryman)</td>
</tr>
</tbody>
</table>

Table 6.1 The interacting packaging levels and e-grocery operations.

These changes will affect a processing and packaging company since it is part of the packaging system by providing the primary packages. Using table 5.1 one can take the packaging requirements for primary packaging and apply it to the design. However the other packaging levels also have to be taken into considerations since changes in one level will impact the other levels (Olsson & Larsson, 2009; Pålsson et al., 2013). So even for a company that is only providing primary packages it is highly recommended to understand and integrate the solution with the secondary and tertiary packaging levels.
E-grocers have to decide on what packaging that fits into the existing infrastructure but they can also adapt the infrastructure to the given packaging. So the challenges are interrelated. There are many components that the e-grocery infrastructure consists of and all have to fit together seamlessly. For example if an e-grocer changes the secondary packaging (e.g. change grocery bags to boxes) they also need to consider how that change will affect the utilization of vehicle space and other parts of the infrastructure. Furthermore not always all of the configuring parts of the e-grocery are provided internally, there are parts that are provided by suppliers, and for this reason the need of collaborations within and outside the company are needed. Primary packaging as an example is not directly influenced by e-grocers; however collaborations between producers and e-grocers would allow them to have a saying in the matter. To create working infrastructures e-grocers need to have a close collaboration with suppliers or wholesalers. For example how suppliers pack the products on pallets or in boxes is important for efficiency in the back-end fulfilment centres.

As Hellström and Saghir (2007) stated there is a cause-effect loop of packaging and logistics decisions, fig. 2.4. The interacting packaging levels are affected by logistics processes in this thesis represented by the processes for e-grocers. And the interacting packaging levels have cause relation to packaging decisions, which the authors will discuss here. The packaging decisions will be looked at from a Tetra Pak perspective since they are representative of the processing and packaging industry in this thesis.

The e-commerce requirements on primary packaging are:

- Brand recognition during ordering and when receiving the product
- Portion/recipe sized
- Stackable
- Sealed properly
- Increased shelf-life
- Ambient distribution
- Robust and steady
- Promoting in-home sales
- Kitchen ready

Based on the data collection at MatHem and Mat.se it was observed that the robustness of some of the milk packages was not reaching the standard of e-grocery operations. These milk packages did not come from Tetra Pak, besides it was stated that Tetra Pak actually provide with good packaging thank to the brick shape and the possibility to have ambient distribution.

Tetra Pak has about twelve different package families. When scanning the product portfolio what stands out is the Tetra Brick Aseptic (fig. 6.1), which does not need a refrigerated distribution and provides a long shelf life for liquid food products. Moreover due to its rectangular shape it is efficient to stack and store. It protects the product’s nutritional value without the need of preservatives. According to Tetra Pak it is a cost efficient way of reaching consumers no matter the distance.

There is nothing that says that Tetra Brick Aseptic is or is not robust enough for e-commerce, however after testing the package in an e-commerce setting there might be implications on making the package thicker or stronger to handle the e-grocery operations. Since the package can be made in different sizes it is also possible to look at how the package can be adapted to recipes or portion sizes. Kitchen ready packaging is also connected to recipes and to have a package that
is easy to work with in the kitchen. For example if the average recipe size of milk is two
decilitre, one litre of milk would mean five smaller packages á two decilitres instead of a big
one. A change of the primary packaging size could have an influence on the packaging system,
for our example the primary packaging would need a secondary packaging to cluster the 5
smaller packages together into one unity. The secondary packaging in this case would not have
the secondary packaging requirements from table 6.1 since it would act as a primary packaging
within the grocery bag. Selling smaller packages would mean that more portion packages are
sold instead of family packs.

![Figure 6.1 Tetra Brick Aseptic](image)

The brick shape of Tetra Brick Aseptic is ideal for e-commerce and if any changes are
considered these should be tested in the e-commerce logistics in order to tell if it is needed or
not. For example tweaking corners on the package or adding visual features for better shelf
impact is not important for e-commerce since the package is only displayed on a digital screen.
The design decisions should moreover be considered based on the in-home and “on the go”
experience since people will make purchases online, probably from their home or on the go from
mobile devices.

Tetra Pak offers approximately 50 different openings and closure for the packages. The most
important e-grocery requirement is that the closure does not leak or break when placed in a
grocery bag/box together with other groceries. Another requirement is that the closure should not
make the package less stackable and convenient for packing. For instant the Flexicap (fig 6.2)
seems to be a suitable closure since it does not stand out from the package, which retains the
stackable functions. The FlexiCap is a reclosable flipcap. A problematic aspect of the caps is that
these are clued on to the packages, hence are sensitive to shocks that can occur in e-commerce
distribution. A cap that is steady and can tolerate the e-commerce distribution will be beneficial
for e-groceries.

![Figure 6.2 FlexiCap™](image)

For recipe and portion sized packages the reclosable function can be considered excessive since
the content is emptied all at once. For this type of packaging a full top perforation (fig 6.3) or
something similar could be an option. The perforation however is currently only available for
Tetra Recart (fig 6.4); hence here is a possibility for further investigations if it is possible to
combine a full top perforation with for example Tetra Brick Aseptic packages.
Tetra Pak is not only offering packaging and processing for liquid food products. Tetra Recart® (fig. 6.4) is the world’s first retortable carton packaging system. It has a unique packaging material structure, which enables it to address a large range of canned food categories and offer up to 2 years shelf life. This type of packaging shows that Tetra Pak has expanded its core business to other product categories than liquid food. Expanding the core business to other product categories become more interesting as e-commerce of groceries grows, for example Mat.se indicated an interest in protection of vegetable, fruits and herbs. The authors of this thesis believe that Tetra Pak, with the knowledge in food protection, has the potential of developing the first packaging that increases the durability of fruit and vegetables without adding any chemicals or preservatives.

Tetra Pak should also be aware that even though the current packaging solutions are somewhat suitable for the e-commerce they still have great potential to improve their packaging solutions. Tetra Pak has the knowledge and experience of creating different shapes that are well suited for an efficient distribution as well as a marketing tool. These competencies should be utilized in order to design a packaging that suits both the current e-grocers operations but also looking at future possibilities, such as automation of picking and packing with robot arms or self-driving vehicles.

6.3 Business Opportunities and Recommendations for Tetra Pak

It is evident from the previous analysis that there is a lot of space for improvement, all the inefficiencies and challenges provide chances for Tetra Pak to capture a value and develop business opportunities.

New customer segments

Niche producers
E-commerce of grocery is making the potential for small and niche producers to enter the grocery market. As mentioned previously the e-grocers are not restricted by so called
planograms and we assume more new products will be tested and released via the online channel. E-grocers are able to sell a product on trial without making a procurement of a large batch. The only things needed are images and content information for the website to be able to sell a product and in theory the product itself can be procured as soon as consumers place orders. Furthermore the consumers can find niche products easier since the website has search engines with filters, while in traditional stores the consumers have to look for products in shelves and isles. The convenience to find special diet food online will give the niche producers a bigger chance to be found by consumers and thereby increase in sales.

**Business opportunity:**
Tetra Pak is one of the largest packaging and processing solution provider in the world, which gives them a sense of credibility in providing their solutions to e-grocers and niche producers. Tetra Pak should focus the sales department and make more effort to find and acquire these companies as customers when these gain the advantage to grow through e-commerce. Since niche producers and new entrants are smaller than the usual Tetra Pak customer, these will probably not afford to purchase a Tetra Pak production system. However, what they can do is to use co-packer facilities. Co-packers are, as the name states, co-packing products for different brands. So Tetra Pak needs to consider if the co-packing systems can handle many niche producers and how to make the process more efficient. Can the co-packers handle smaller series with a larger variation? This business opportunity does not require any new capabilities; however it is about being conscious and to make adjustments if needed.

**Marketing services**

**Brand owners**
Brand owners have a new sales channel for their products and they are not limited to a shelf space in the same way as physical stores. This leads to the opportunity of creating new ways of brand building to catch the attention of the consumers.

**E-grocers**
E-grocers are using their website platform, their collaboration with recipe sites and social media to market themselves. The main struggle in marketing is to convey the freshness of their products through digital channels to build consumer trust. Many consumers are doubtful about the quality of products that they cannot pick themselves, and furthermore e-grocers ability to pick, pack and distribute the groceries. E-grocers digital marketing is crucial for relations building between the consumers and e-grocers. They use traditional channels such as advertisement on billboards and television commercial and also social media as a tool. They are in need of a new ways of marketing of values such as high quality of their fresh produce, for example communicating the freshness of the mango or the perfect ripeness of avocados.

**Business opportunity:**
Tetra Pak has a department for marketing services, in which they offer their customer a marketing strategy for new and existing products. Since e-grocery marketing has different conditions, the marketing service at Tetra Pak should be adapted to those conditions in order to provide the service. For example the online environment allows different product categories to be promoted together, a frozen pizza can be “placed” next to the soft drinks, or the milk can be displayed next to the cookies. So using the ability to provide with marketing services could be more important for brand owners now since online is a new sales channel for many of them.

Furthermore Tetra Pak has a good brand reputation. “Protect what’s good”, conveys products quality in the sense that consumers feel trust that the packages contain safe and nutritional
products. Tetra Pak could assure product quality during the last mile with their label on the packages that indicate for consumers that the products are safely distributed. Once the consumer sees that the last mile distribution is secured by a third (trustworthy) party, Tetra Pak, they will potentially get a sense of trust towards the e-grocer.

**Lean operations**

The traditional grocers replenish towards stocks and empty shelves while e-grocers replenish based on consumer demand and placed orders. Technological trends such as Big Data and Smart Machines are likely to be used to advance the replenishment systems to create lean operations for e-grocers. Furthermore e-grocers are in need of lean operations from the supply side as well, they need to have short lead times and flexible delivery from suppliers.

**Business opportunity:**

If e-grocers are willing to share their data one possibility could be that Tetra Pak develops a smart processing and packaging system in which e-grocers consumer order data is connected. By doing so, producers are automatically producing based on demand rather than stock, which is both lean and sustainable in the sense that it enables shorter lead-time and reduces waste. However there is big obstacle to overcome (if ever possible), which is the lack of trust between the stakeholders with sharing their data information. This is partly due to the high competition between brand owners and private labels. Furthermore retailer data is very expensive, will producers pay for the information or could they share the information for free if they would benefit from it?

**Securing cold chain distribution**

One of the biggest challenges in e-grocery is securing the cold chain. Even though there are various delivery options available today there is a big issue, which is to preserve the quality of fresh produce, and chilled and frozen products until the fridge and freezer is reached. A big value for consumers is to receive their groceries at home, but there are circumstances in which consumers might not always be at home to receive the groceries. Currently solutions such as trucks with cooling systems and special isolating bags (e.g. iFoodbag) with for example dry ice are used to secure the cold chain distribution.

**Business opportunity:**

With 40 factories worldwide Tetra Pak has the capacity of producing 185 billion packages per year, with laminated packaging material. The packaging material together with the aseptic processing is what makes ambient distribution of perishable food products (e.g. milk) possible. Tetra Pak being an expert on aseptic packaging might have the capability to secure other temperature sensitive products, such as fruits, vegetables and fresh herbs. As mentioned in the previous section packaging solutions for e-commerce would imply a great value for e-grocers since they could decrease the need of energy for the cold chain and ensure a quality standard of all types of food products. This opportunity is about finding a way of protecting single products amongst a larger number of other product types. It could mean that Tetra Pak develops a primary packaging for fruits and vegetables or it could mean creating a solution for the secondary packaging in order to protect the entire content. For example grocery bags that contain frozen products are usually filled with dry ice to preserve a low temperature; an opportunity for Tetra Pak could be to create ice packs made of packages filled with liquid which is drinkable after thawing.

**Replenishment system**

There is a high transparency in e-commerce of groceries, in which consumers are able to
compare e-grocers and products online. Furthermore the transparency also allows order tracking for consumer, where they can follow the groceries when an order has been placed until it reaches their doorstep. It has also been observed that e-grocers are considering the opportunity to offer more transparency about product background, i.e. showing where the product has been produced, how it has been distributed, and what the carbon footprint is, and so on. Moreover retaining costumers is important for e-grocers, as for any other business, since a consumer only is profitable when shopping continuously. E-grocers need to create incentives for consumers to re-order and make online grocery shopping a habit.

**Business opportunity:**
Tetra Pak offers primary packaging for liquid food products, these packages are integrated in the supply chain all the way from the producers down to the end-consumer. So there is a potential of using Tetra Pak packages for traceability and transparency throughout the supply chain. Moreover the packages could also be used to ensure consumer replenishments when it has reached the end of its life-cycle. If the package for example has a barcode connected to the consumer’s online grocery basket it would increase the convenience of ordering, or even better if for example the package would automatically add the product to the grocery basket through sensor-technology. Brand owners could provide personalization by connecting the barcodes to special offers and recommendations. For instance a gluten intolerent consumer could get offerings and recommendations about other gluten free products.

**Kitchen ready Packaging**
There has been some notion about kitchen ready packaging but what it exactly it means is still unknown. Things that have been brought up however is being able to order the exact amount of groceries that is needed by the consumer but then there is a lot of thoughts into what consumers actually are doing in their kitchen, is there latent needs that can be met if a observational study was conducted?

**Business opportunity:**
Tetra Pak should investigate further into kitchen ready solutions in the sense that the consumer wants a specific quantity of certain products instead of buying a full package. Looking back to the time when supermarkets had not yet been introduced, consumer had local stores in which they only bought the amount of product they wanted, and the cashier offered the service of picking and packing. E-grocers already offer the service of picking and packing and it has been stated that they would like to offer a more tailored grocery bag to their consumers. A future vision could potentially be that the consumers are able to type in how many units of a product they want, e.g. grams of rise or ml of milk, when adding groceries into the online basket. This leads to Tetra Pak could potentially be the first one to offer a tailored package sizes for end consumers. The need of a higher quantity of packages would mean that Tetra Pak can earn more on their core business, packaging material.
7 CONCLUSIONS

The most important conclusions will be presented in this chapter. The benefits of this thesis will be elaborated, the limitations due to choice of method will be discussed, and some last conclusions regarding the results will be presented.

This research covered the area of e-commerce of groceries and a cross sectional study was conducted in order to answer the research questions. The cross sectional study gave this research the flexibility to describe and analyze the new market. Great insights has been obtained during this study in which stakeholders in the supply chain will benefit from, not least for processing and packaging solution provider.

Online grocery shopping is a disruptive business model but it is worth to mention that online grocery shopping has existed since 1991 and an interesting question is why it is happening all over again and what are the success factors in regards of this growth and the technological advances? For one thing, we live in an ever more digital world which will further advance and develop over time thus creating the conditions in which e-grocery can thrive, and further people have more hectic and stressful lifestyles thus we value services in which we are provided with convenience and simplicity. The service that e-grocers are providing today could look entirely different in the future. The manual picking and packing could be managed automatically and the need of manpower could eventually be eliminated. Considering the emerging technologies such as big data, IoT technology and machine learning e-grocery operations have the potential of being reshaped entirely.

One of the first conclusions in this thesis was that e-commerce of groceries is a new sales channel which is affecting the supply chain for retailers. The most significant and straight forward changes are downstream from the suppliers/wholesalers. All the activities that happen from the back-end fulfilment when it receives products, and all the way to the consumer, are interesting to understand and evaluate in order to find opportunities.

Further, the value chain for e-grocery is evidentially different from the traditional value chain in that they offer a service of picking and packing and thereafter deliver it in a safely manner to the consumer. Within that service e-grocers are facing a lot of challenges and inefficiencies including the high operational cost for their delivery model, conveying the trustworthiness of their service, providing flexibility in line with the consumers’ lifestyle and preference in regards of time-slots and delivery option. All the stakeholder involved have optimized towards the traditional grocery value chain and seeing that the online grocery shopping is gaining a rapid growth there are both opportunities and challenges to take upon and adapt accordingly.

The authors found that Tetra Pak offers packages that already are suitable for e-commerce of groceries. The Tetra Brick Aseptic is a primary package that fulfils the majority of the packaging requirements expressed by e-grocers. The question that still remains is if Tetra Pak is willing to expand their core business which includes processing and packaging for liquid food products into other product categories such as fruits and vegetables. Tetra Pak’s motto is “Protect What’s Good” and since many product categories are exposed during last-mile distribution, Tetra Pak could potentially secure these product categories as well.

The business opportunities should not be viewed as the only opportunities or the right ones. These are just to show the reader that opportunities within e-commerce of grocery exist and to inspire for more ideas. Furthermore these opportunities should be placed into a context and described by a business model, as Clayton (2004) states; it is the business model that is disrupting the market rather than the technology itself. Further, it should not be forgotten that some business opportunities have to be described in entirely new business models than the
existing ones, since established businesses rarely can develop a breakthrough innovation (Johnson et al., 2008). Hopefully the “important jobs” (Johnson et al., 2008) have been identified in this thesis and can now be used as inspiration for future research innovations.
In this thesis the authors restricted the scope to the e-grocers to be able to investigate the e-grocery requirements thoroughly. However the design of the packaging can influence the performance of each actor in the supply chain (Simms & Trott, 2010). So for future research it is interesting to understand how changes in the packaging system have an impact on other stakeholders than the e-grocers. The package and product should be studied throughout the lifecycle (Hellström and Saghir, 2007), which also indicates that including other stakeholders all the way from filling to consumption would give a better ground for packaging designers.

Further studies within the area of packaging design for e-commerce is recommended since new technologies and methods are evolving and changing the distribution. Tetra Pak has created packages adapted to traditional grocery distribution and need new deep understanding of the requirements based on the new e-grocery distribution.

Even though the research was conducted around a processing and packaging solution provider, there are further insights into how e-grocers could go on and solve their operational costs. The store based e-grocers could initiate smart collaborations with ventures like Urb-it and Instacart and cooperate with other online retailers for potential joint delivery in last-mile distribution. Technological trends have the possibility to create seamless and convenient solutions both for consumers but also for e-grocers.

Lastly, the authors would recommend stakeholders involved (e.g. food producers, processing & packaging solutions provider) to always keep an eye on every trend, every demographical change, every behavioral change, and every technological change in order to innovate and adapt accordingly. Consumer loyalty will be harder to achieve due to full price transparency and a range of options to consider. The e-grocery market is in its initial phase with rapid growth and rapid pace of change leading to a dynamic market with a lot of opportunities to capture.


Deloitte (2013) ”The food value chain: A challenge for the next generation” Creative Studio at Deloitte.


Mann, C. (2003) "Observational research methods. Research design II: cohort, cross sectional, and case-control studies” Research series


Murphy, A.J. (2003), “(Re)solving space and time: fulfillment issues in online grocery retailing,” Environmental and Planning A, 35, pp. 1173-1200.


Rabobank (2014) "Online Grocery Shopping; The Challenge to be seen on Screen." Rabobank.


Syndy (2015). “The State Of Online Grocery Retail In Europe” Syndy Research & Insight


APPENDIX A: INTERVIEW SUMMARY

**MatHem = MH**

**Consumer**

In consumer surveys that MH has conducted they have seen that consumers ask for more organic food and locally produced. MH has a good organic assortment, 25% of the total assortment is organic.

MH believes that they affect their customer’s lifestyle through timesaving and quality. The customers save 3-4 hours per week and can spend that time on for example their families instead of walking around in a grocery store. Furthermore all groceries that are offered by MH have a good quality first and foremost because it is handled with carefulness and not exposed to hundreds of other customers touching and squeezing the product. And secondly because fresh produce is usually ordered from suppliers the night before an order is going out to the customers so the products are fresh when it reach the customers.

The vision is to simplify people’s life every day. Many of the customers are families with children. More people will use e-commerce for groceries from coming generations that are born with mobile phones and computers as a regular tool.

**Marketing**

Freshness is difficult to communicate, but MH tries to use social media to post photos of different fresh produce and write about how fresh and good it is. It is not easy to put a metrics on freshness. All types of marketing channels (social media and traditional) are used in order to convey freshness and convince customers to use the service. But in the end it all comes down to recommendations from friends and family, 9 out of 10 customers recommend our service to others.

A substantial portion of the costs can be derived from marketing such as commercials, advertising etc. Need to spread awareness at this stage. MH is expanding faster than the total market; the interviewee thinks it is due to a strong trademark and hope it is because of the good quality of the products and service.

**Assortment**

Has both free picking from a full assortment and grocery basket dinner solutions. Consumers can combine dinner solutions with free picking from the full assortment. The largest volumes come from the full assortment. The product assortment is adapted partly to the location of the customer since some fresh produce might come from local suppliers. The assortment online is not as limited as in a traditional grocery store, MH has the capacity to offer what the customer demands without making it complicated for customers to find the product in long confusing isles.

**Product display**

MH uses a template for the suppliers, where suppliers fill in size, weight and content information of products. Suppliers provide with images of the products, however MH has a photographer who can take photos if an image has a bad quality. The better a product description is the better it will sell online. So suppliers can benefit from a good product presentation as much as we can benefit from it, it is a win-win situation. MH uses Valido to get images and product information for products that they receive from the wholesaler. Valido does not always have the information that is needed and in those cases a direct collaboration with smaller suppliers is better, because of the direct communication with the suppliers.
Packaging is not used for meat online, since it conveys a nicer image of the product. MH tries to work with the product presentations to create a nice website. But it is impossible to put too much effort into every single product so it is up to the suppliers to also make an effort.

**Placing an order**
Orders can be placed through the mobile application or the website. Groceries can be added to the basket through recipes, pre-made grocery baskets, free search, or through scanning of barcodes (EAN-codes). Recipes can also be added from other websites, for instant recipe sites such as Arla and Tasteline are connected to MH’s shopping carts. Furthermore customers can use filters to find specific groceries according to a specific diet or lifestyle. For example a lactose intolerant person can use a filter for lactose free products. New filters are set based on the customer demand, the IT-department is in charge of the website development and maintenance. Consumers can shop once or twice, without subscriptions.

**Back-end fulfillment**
Outsourced services: Pick-by-voice system and a route transportation optimization system. Pick-by-voice is about picking with a voice in headphones telling the staff what to pick and what location to pick from. It optimizes and prioritizes the picking in order to do stay efficient. The systems for both picking and transportation optimize during the night before the delivery day.

The staff starts the workday at 5 am in order to be able to start the deliveries early in the morning. The trucks leave the warehouse continuously during the day, however there are clusters of trucks leaving at 6-7-8 am and 5-6-7 pm.

The warehouse layout consists of a high frequency zone, low frequency zone, and a super low frequency zone. Different sized boxes are used for picking from these zones. For the super low frequency zone smaller boxes are used as customers buy fewer of these goods. Goods are picked both from shelves and pallets in all the zones; this depends on the size of the products.
MH can monitor the picks per hour, and see how the tempo goes up and down during the day (interviewee cannot tell an exact number). Approximately 3000 orders are places per day, and the staff work approximately 5 am till 6 pm every day of the week. Furthermore the warehouse has a freezer zone and a fruit/vegetable zone. Special educated staff that knows how to handle perishable food carefully picks the fruits and vegetables.

The biggest challenge is to keep operations time and cost efficient. A constant battle is placements of products, where and how to pick products, loading the trucks fast and so on. There are routines to ensure the quality of the products, like for example temperatures have to be measured in different zones and in the trucks.

The warehouse is manual besides having conveyor belts before reaching the truck loading station and using the in-ear pick by voice system.
Deliveries
MH offers home deliveries, and as mentioned they try to optimize the routes to get as many stops per truck, in order to be environmental friendly and financially sustainable. The truck drivers are educated to provide with appropriate customer service, which is being nice, offer help with carrying groceries into the kitchen and so on. The customers have to feel safe and receive a good service. The customer gets a time slot for the delivery and if the customer is not at home at the appointed time the truck driver will call and ask if the groceries can be placed at the door outside. At MH they do not believe that click and collect will be successful in Sweden, they offer customers to appoint pick ups at for instant gas stations however almost non are using the service. Home deliveries are seen as what makes the e-commerce of grocery successful.

MH also has same day deliveries, and the decision to offer same day deliveries come from the fact that all customers are not as planned as they should be for online shopping. With this offering MH can reach the customers who remember that they need to go grocery shopping in the morning the same day.

Delivery areas are decided based on demand and if there are many people who have showed interest of ordering groceries online from a specific ZIP code. With this control they can assure that no orders will be placed by customers in a geographic area which is out of reach or costly to reach.

MH handle the transportation internally instead of outsourcing it to for example DHL or Schenker, this is due to the need of flexibility and precision of deliveries.

Packaging
MH has problems with the packaging for minced meat, since it leaks when it is placed side ways. Other packages that are problematic are the once that have a foil and a plastic lids as sealing, e.g. crème fraise, since the plastic lids fall away and makes the foil exposed to damages and leaks.
Vacuum packages are better for meat and fish since it increases the durability of the products.

MH has a problem with the caps on the milk packages; the caps can get loose and leak which can destroy an entire grocery bag. Moreover the brick shaped milk packages are liked because it is stackable and easier to pack.

HM has started to make demands on pack sizes, dialogues about adapting packaging sizes to recipes have been taking place but not a lot has happened in the area. For example if a customer wants to cook chicken for 4 people they should be able to get a package containing 4 chicken fillets instead of 6. Also for example fresh baked bread is sold per piece, and MH wants the bread to be packed according to orders when it arrives from the supplier. Currently the bread comes per piece and the pickers have to pick and pack it into plastic bags.

When packing grocery bags the weight is more problematic than the space. If the bag gets too heavy it can break. MH has a good collaboration with the paper bag supplier; these have dimensions that fit into the topes. Moreover MH always look for options that can optimize their operations, so if there is a better crate, paper bag or whatever it could be to optimize, increase efficiency, and save on costs they are open for it.

iFoodbag has been tested, however it did not meet expectations on the ability to isolate temperatures.

**Suppliers**
The CEO (Tomas Kull) has had a presentation for suppliers at a DLF conference about how suppliers can adjust to the e-grocer’s requirements.

Info from the power point:
- Picking friendly packaging
- Packaging for e-commerce
- Visible labeling with kfp (product) EAN on tertiary packaging (outer package)
- Visible labeling with dates and batch numbers on kfp
- Fixed weight on meat instead of weight intervals
- Better dates, e-grocers do not sell until last day of expiration date.
- Flexible operations in order to follow trends faster; Fast information about products, origin, and content. Want to be faster when launching products.
- Fast deliveries and information about the deliveries (how much is coming) beforehand.
- Better-packed pallets to avoid the risk of crushed products.
- Do not mix products categories on pallets, and use different pallets for frozen and chilled products.
- Cartoon pallets are good.

Shorter lead-times and better expiration dates from suppliers are constantly asked for. MH are loyal to their fish supplier, they have an exclusive collaboration and the supplier adjust to MH’s requirements.

MH also has a good collaboration with Dagab (Axfood wholesale), there is a daily communication between them and MH purchase department. Working with Dagab is good since they can provide short lead times, deliver the same day, and deliver smaller batches of different products. However using direct suppliers is considered whenever a better price is offered, for the
sales personnel a direct contact with suppliers is better. Everything is not available at Dagab hence some products are acquired directly from suppliers. MH has around 50 suppliers currently, but with some suppliers it is impossible to reach the minimum delivery requirements (especially in Gothenburg which is a smaller market than Stockholm) and that is why a wholesaler is good.

MH experience that the response time between consumers and suppliers is different for e-grocers. They can react faster to customer demand and also send the feedback to suppliers who can improve their products. No specific customer data is sent to the suppliers, they get the orders in volume and sometimes information about customer complaint, but no more data than that.

**Procurements**
The order model for MH is challenging since they have to sometimes place orders before knowing how many customer orders they will receive. In a physical store whatever is on the shelves are sold and if something is sold out the consumer will notice an empty shelf. For online grocery it is difficult to know which products should be closed down due to “empty shelves” and which ones can be replenished for the order. Since orders can be placed many days before the delivery an empty shelf can be misleading.

Minimum requirements on delivery volumes from suppliers are also causing problems since some products are not sold in that volume. MH wants to avoid waste and having volume requirements can cause waste when products are not sold, especially for fresh produce.

Placing orders is sometimes not convenient; some suppliers want to have orders placed on their websites, which is an unnecessary procedure for MH. So they have demands on being able to place orders via mail and then get the order delivered on time.

**Strategy**
There are no plans of selling the system or capacity (like Ocado) to others, instead they visit exhibitions and conferences to share knowledge and inspire others. Ideas are also shared within the venture capital. The question is also who would be interested of buying the system, Mat.se already develops their own and Ica has another type of system since they pick from store.

Competition is good since that increase customer’s awareness of e-commerce of groceries. MH believes that competition from the bigger actors like ICA will normalize e-commerce of groceries and thereby increase the consumer’s tendency to use the service. Competitors should see each other as partners instead, and work to grow the market together.

In the transparence marketplace the price of groceries is not everything that matters, the freshness and service also plays a part of it. Therefore discussions with sites such as matspar.se (comparison sites) are ongoing, factors like shipping fee is difficult to show since it differs depending on the time of the day and where it is going. Still it is difficult to communicate freshness of fresh produce. And it is after all a service and not the products that are sold.

**Sustainability**
Using e-commerce for grocery shopping is stated to be environmental friendly due to the savings on transportsations. For deliveries one truck can deliver 30 orders, this replace 30 individual shoppers driving back and forth to the store. Furthermore the traditional grocer have to drive all the groceries from a central warehouse out to different store locations, since only one large warehouse is needed for e-commerce these transportations are not necessary anymore.
Decreased waste is also another aspect; in a traditional store a lot of groceries are wasted while MH try to reduce the waste to zero. If something is uneatable or moldy it will be thrown away, but if it is just ripe and too soft it will be eaten by the staff or sold in the staff store (everything is sold for half of the price).

**Mat.se = MT**

**Consumer**

MT’s mission is to create a sustainable flow. MT will make it more smooth and sustainable for customers to shop in a better way. They believe that offering inspiration through recipes (e.g. Kokaihop) will lead to smarter and more sustainable consumers. The vision is to somehow make it possible for customers to not shop at all, and only shop if they want to. Through smart IT solutions and algorithms MT wants to create a system that can suggest individualized grocery baskets. Currently they can give customers suggestions based on previous buys, what other people have ordered and what is in season right now.

MT’s value propositions:
- Cost savings; the customer avoids transportations, impulse buying, and can plan the grocery shopping in a way that avoids waste.
- Convenience; the customer can order from home and avoid carrying heavy bags and drive to and from a store. And the e-grocers are available all around the clock.
- Quality; since the customer does not pick the groceries themselves the quality is crucial. The quality has to be high in order to please the customer, otherwise they will just complain and say that they would not pick that if they could choose.

**Product display**

Dabas, Valido, OPV, and an internal database are used in order to find information about products. Suppliers add their information and we use it on our website. Valido is the most used, OPV comes next and Dabas is used by a few. Some of the small suppliers that are not in any of the systems use our own database where they can add information, images and so on. MT takes the photos by themselves in some cases when the images have a bad quality.

**Placing an order**

The customer can add products to MT shopping carts through Kokaihop (recipe site). Search tags, filters, and 3-5 different algorithms are used for the website in order to provide convenience in the ordering process.

**Back-end fulfillment**

The warehouse is stated to be very simple, the goods arrive and are unpacked and placed into a floating warehouse, which means that nothing have fixed placement. The products are placed based on the size of the delivery or the products, MT only needs to know the size and tell the system in which a placement will be given. The warehouse has a freeze, chilled and ambient zone. The fruits and vegetables are divided into either chilled or ambient depending on what is best for the quality for a particular type. Pickers use tablets as a tool to know what to pick and where it is located. When everything is picked and packed the truck drivers will load the trucks with the prepared orders. All the trucks are also provided with tablets. And MT can track the trucks through a system and customers can follow their orders all they way home through the same system.

There is no automation in the warehouse other than some conveyor belts. The pickers walk around and pick what the tablet tells them with pictures and visuals. MT will try a voice based
picking system that they have developed in-house. The interviewee believes that the warehouse will move to a semi-automated dark store in the future.

Quality of fruits and vegetables are first checked by the suppliers and then checked by MT twice before leaving the warehouse.

**Deliveries**

MT has same day deliveries, they offer one-hour delivery slots, and there are no shipping fees when order reach above 700 SEK. Below 700 SEK shipping costs 29 SEK. MT offers home deliveries and deliveries to Volvo cars (with Volvo on-call). Moreover the company is looking at other solutions for the future delivery models, however the information is classified material. What MT can say is that the distribution solutions will probably look entirely different in five years. The interviewee believes that delivery models will change due to new opportunities to deliver when the customer is not at home. For example if the cold chain can be secured products could be delivered to a special grocery box outside the home or even be sent to the other side of the nation without delivery trucks with freezers.

Transportation routes are planned and can be followed though a map system. MT has a transportation firm named ColdCargo, they are owned by the same venture. The trucks are out on the road between 1-10 pm everyday, and forecasts of sales have to be done for each day.

The so-called last mile is the most challenging part of the logistics. A short delivery time slot has to be precisely met. The products that are picked and delivered have to be 100% correct and remain 100% correct and have quality all the way to the consumers home. It is challenging to change a customer behavior and convince them that the home deliveries are worth the price. The most important parts of the last mile are the customer experience, the customer service and the delivery fulfillment.

**Packaging**

Tetra Pak packaging is good for e-commerce according to the interviewee since it is stackable and can maintain temperatures. The temperature aspect is important for the cold chain and therefore MT use iFoodbag for both frozen and chilled products. The frozen products need additional dry ice in order to stay frozen however the chilled products can be places in the bag without ice substances. iFoodbag allows in-car deliveries or unattended home deliveries since the products can be placed in ambient temperatures. The interviewee thinks that packaging industry has to realize the opportunity in this area and create solutions that allow longer transportations without damaging products. Currently iFoodbag is better than other options such as Styrofoam boxes, however it is not optimal and can be improved further, according to the interviewee.

The packaging for minced meat that MT use is not adapted to e-commerce on purpose, however it is appropriate for MT’s flow of goods, says the interviewee. It is packed in a tube so it takes less space, and the durability is longer than usual since it is sealed properly. However MT has received complaints about the product out of different reasons, such as not getting the same quality on meatballs, but the interviewee believes that the complaints are just because the package is new and different.
MT would like to see packaging solutions that improve the handling of products during picking and packing, make sure that products do not get damaged, that it is stable and maybe for the future that robot can pick and pack products easily. Labels should be placed clearly visible.

**Suppliers**
MT has tried to ask for better and smarter packaging solutions from the fruit and vegetable suppliers, but asking suppliers to change has not been on the agenda. The larger supplier like Nestlé and Unilever are starting to realize the value of e-grocer industry according to the interviewee. MT uses the wholesaler Bergendahls for the main part of the assortment. Furthermore MT has 40 suppliers that are not connected to Bergendahls. For example they have separate suppliers for fruit and vegetables.

According to the interviewee the barriers to enter the e-grocery market will be lower than the traditional grocery market, and more suppliers will be able to sell their products online. Launching a product is easier online since it is only about supplying a product to the fulfillment center, for a company as for instant ICA it takes a lot of time and money to add a product to the assortment. MT do not even has to have the product in stock in order to try to sell it online.

MT only uses suppliers that reach a certain quality standard. For example oranges sold in net is not always good quality, so even though it is cheaper MT will not offer those oranges to the customers. Customers are pickier when it comes to quality of products that they receive from an e-grocer since they were not involved in the picking process. The good side of getting complaint is that the feedback gets faster to the suppliers, and they can have a closer relationship to consumers.

**Procurements**
MT would not be able to handle all the article numbers without the wholesales Bergendahls. Currently they have 9000 SKU and these are mostly in small numbers. When MT did a test run with only 30 customers they reached 3000 articles, so the needed demand on each SKU does not necessary need to be high.

The larger volumes are possible to order directly from suppliers however the smaller volumes would be to expensive to order from suppliers and sometimes it is not even possible since they have minimum requirements on volumes.

MT only orders what is demanded from consumers, so they have created a just-in-time system.

**Strategy**
MS is expanding faster than the market, growing faster than other grocers and also the grocery basket dinner solutions.

An industry without competition is difficult since consumers have to learn a new behavior. So the interviewee believes that a bit of competition is needed, and in order to stay competitive they need to be good at what they do. The competition on the total grocery market has changed, it would not even be possible for a company of MT’s size to survive the competition from big players like ICA if it would not be for the online sales channel.
The interviewee sees that the future holds many new technologies for better logistics. Automations and self-driving cars will probably be available sooner than people think.

**Sustainability**
Sustainability is part of the overall mission and vision. MT wants to help the consumers become sustainable in their choices by increasing awareness about for example the carbon footprint of different products. The interviewee thinks that would be good to optimize the transportations further and make the transportation system more sustainable by lowering emissions and increasing efficiency.

**Costs**
To replenish products have the biggest cost post. Transportation and warehouse operations (back-end fulfillment) cost almost the same. One of the biggest costs is marketing, which is needed in order to change customer behaviors and raise awareness about e-commerce of groceries. Another big cost is IT, to develop and maintain the systems. Everything is done in house except of the route planning system and some front-end operations such as marketing.