

## **ACKNOWLEDGEMENTS**

First of all, thanks to God for make my dream come true!

I want to dedicate this master to my parents, without their support, this dream would have not been possible. This thesis is dedicated also to my brothers and nephews. Thanks to Guatefuturo and its support.

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## SUMMARY

E-commerce and Internet sales are becoming more popular every day. Nowadays is possible to find many different types of products online, including different variety of food products. This trend is becoming popular in Norway and in the rest of the world. However, to be successful in the market with an online channel, is not enough for businesses to have a competitive strategy but also to have efficient physical distribution processes and logistics operations when offering perishable food products online to end consumers. Management of supply chain and order fulfillment operation are becoming critical for businesses with an online channel and perishable food products, since these type of products not only require efficient logistics but also special conditions to preserve its quality.

To confirm that the management of efficient logistic operations are critical in an online channel. The aim of this study is to understand how the supply chain and order fulfillment operations of the online channel are been manage. The aim of this thesis is contribute by developing a “Logistics Guideline” for those independent businesses working with an online channel and perishable food products.

In order to do this study 3 research questions were established:

1. Which SC configurations are been used for businesses that offer perishable food product through an online channel?
2. How fulfillment operations of an online channel are been operated when offering perishable food products to consumers?
3. Which logistic operations business working with an online channel need to focus on to stay competitive?

This research study was accomplish in two parts: theoretical and empirical. The theoretical part includes a literature study in online channel, customer requirements, food special characteristics, logistics requirements of food products, supply chain management and fulfillment operations. The empirical part consists of two case studies conducted to two Norwegian companies that offer baskets with food products online to end customers. The data collected from these empirical cases, was obtained by doing one semi-structured interview to each of the general managers of each of the companies.

The literature study was realized to answer the research question 1 and 3 of this study, and to create an interview guide to interview the companies, answer research question 2, and support RQ1 and RQ3. Literature found reveals that the SC of businesses working with an online channel are similar to the traditional ones, and that they mainly differ in the way to make products available for the end consumers. Additionally, several papers were found, that explain the relevance of fulfillment operations in an online channel. These processes typically include operations related with: supply management, purchasing process, warehouse operations, delivery service, and service quality. There was almost no evidence of papers describing independent business working with an online channel. Most of the papers found present information related with traditional retailers, pure online players, and “e-tailers” that work with an online channel.

The main outcome of this study is the creation of a guideline based on information gathered from the literature study and from the case companies. This is related with question three, and one of the objectives of this thesis. Literature reveals the importance of supply chain and fulfillment operations in an online channel, while case companies reveal methods and practices to accomplish efficient fulfillment operations. The main goal of the “Guideline” is support business or retailers that work with an online channel and food products, with logistics considerations and practices to improve its SC and OFO when handling perishable food products, since these aspects can help them to achieve competitiveness and keep with satisfied customers. To sum up, this guideline can reveal different aspects that companies working with an online channel can focus on in order to enhance its logistics and maintain a sustainable success in their local market and in new markets.

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## **List of abbreviations**

B2C Business to Consumers

DC Distribution Center

EDI Electronic data Interchange

E-PDSQ Electronic physical distribution service quality

ERP Enterprise Resource planning

ESC Electronic- Supply Chain

FC Fulfilment Center

FSC Food supply chain

OFP Order fulfillment process

OFO Order fulfillment operations

OGS Online Grocery Shopping (OGS)

RFT Radio Frequency Terminals

RFDI Radio Frequency identification

RQ Research Questions

SC Supply Chain

SCM Supply Chain Management

SFSC Short Food supply chain

TPL Third party logistics

WMS Warehouse Management Systems

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# 1. Introduction

*This chapter contains the background of this study and presents the relevance of the research area. It outlines the research motivation, objectives, questions and scope of this thesis.*

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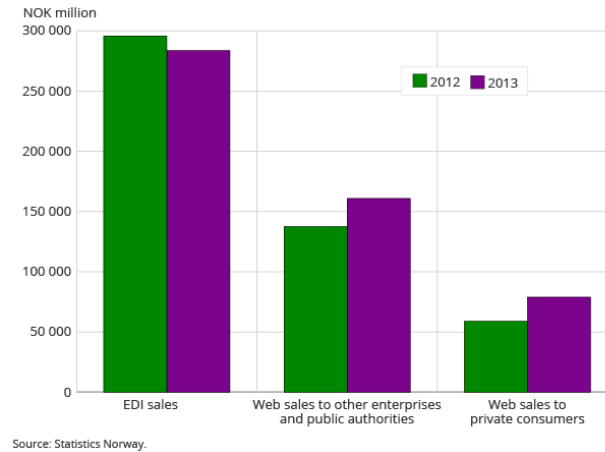
Internet and the emergence of new technologies are changing consumer behavior and purchasing patterns (Kumar et al., 2014). Nowadays, e-commerce has become an important tool to make businesses in today's world, Internet is becoming an important distribution and sales channel. This new global trend is changing the way that supply chains are being operated (Johnson and Whang, 2002) and has made several companies in different industries to implement an online channel strategy to reach their consumers.

In general, managing an online channel implies new challenges for companies since the way to operate its supply chain is relatively different from the way to operate a "Traditional supply chain". Especially when we refer to businesses that manage fresh food products, since in most of the occasions these require specific conditions to preserve its quality, efficient order fulfillment operations (Enders and Jelassi, 2009, Agatz et al., 2008, Waters and Rinsler, 2014) and dynamic supply chains (Kumar et al., 2014).

In the past, it was enough for grocery retailers and other independent businesses to offer perishable products in regular stores to final consumers. However, offering products online is becoming more popular in many part of the world including the Scandinavian countries. This trend is also growing in Norway and with independent business offering food products.

According to SSB (Statistics Norway) in 2013, the turnover from e-commerce sales was estimated at NOK 523 billion. 54% of the turnover from e-commerce sales was generated from EDI sales, while the rest was from web sales. One third of the turnover from web sales was from private consumers, which rose by 34 per cent from 2012 to 2013 (Statistics Norway 2013). See Figure no.1.





**Figure 1: E-commerce. Turnover from sales and web sales. Enterprises with at least 10 employees (SSB, 2013)**

In general, the purpose of an online channel is to allow different customers buy products from an alternative places in an easy and convenient way. Since this channel does not has the restriction of time and its available for consumers 24 hours a day, 7 days per week. Working with an online channel implies efficient services to end consumes(Agatz et al., 2008). Further, it is also a fact that individual customers are becoming multi-channel shoppers, preferring different channels at different stages of the shopping process (Nunes and Cespedes, 2003, Rangaswamy and Van Bruggen, 2005).

Working with perishable food products online, implies efficient supply chains and logistics operation (Georgiadis et al., 2005). For these reasons, efficient supply chain and OFO are critical when working with products online, since these logistics operations could allow those online retailers and independent business to keep its customers satisfied and success in their markets in the long term.

The structure of this thesis is presented as follows: Section 1 describes the problem description of this study, clarifies its objectives and research questions, and explains the scope of this paper. Section 2 gives an overview of the research methodology that will be address. Section 3 provides a theoretical background of different topics related with the study. Section 4 present empirical data from Norwegian businesses that offer perishable food products online. Section 5 presents an analysis of the main findings, section 6 presents the solution and discussion for the different research questions of this study. Finally, Section 7 draws conclusions and offers suggestions for future research.

## 1.1 Problem statement

In view of the increasing of online shopping and the forthcoming of the multichannel and omni-channel strategies. It is relevant to understand how the supply chain and distribution network of the online channel is been managed, and how this channel is operating its fulfillment operations to deliver quality products to their customers.

Operating an online channel has pushed supply chains structures to be more complex, and dynamic (Agatz et al., 2008, Rosenbloom, 2007), and to become highly efficient, specifically for those ones that manage food products, since these products require more efficient logistics due to their perishability and limited shelf life. When businesses are working with an online channel and food products they are dealing with challenges like: management of several suppliers, low margin products, perishability, small orders sizes (relatively small transactions with several articles), delivery service to individual consumers, transportation with special conditions, time consuming warehouse operations (picking and packing) customer with high expectations and intense competition. Therefore, is important to analyze and discover how these businesses are operating their supply chain and other critical logistics operations, since these operations are key for its future success.

Some researchers have claim that we are in a time where is important to do activities different than competitors by implementing value adding and customized activities that excel costumer expectations (Sorescu et al., 2011) or be specialized in a market segment that allow companies have higher profits (Sorescu et al., 2011).

For these reasons, the main objective of this study will be: Analyze how businesses that are operating an online channel and perishable food products are managing its logistics in relation with their supply chain and order fulfillment operations (Agatz et al., 2008, Waters and Rinsler, 2014).

Consequently, having a good and efficient management of these logistics operations and develop efficient value-adding activities will allow these businesses be profitable and achieve a competitiveness in the market where they are operating.

To make this study more accurate, two companies that operate in Norway and offer perishable food products online will be analyze and the configuration of its supply chains and fulfillment operations will be investigate.

Other topics that this study will cover to make this study more complete are topics related with: marketing and distribution channel characteristics, customer characteristics when buying through different channels, food specific characteristics and logistic requirements to keep food products conditions.

## **1.2 Research objectives & questions**

Base on the research problem and motivation stated previously a number of objectives and questions have been defined to accomplish this research.

Study objectives:

- Analyze the Supply Chain structures and order fulfillment operations of businesses that are selling perishable food products online.
- Conduct two case studies and describe how these Norwegian companies that offer food products online are designing and structuring its SC, and how they are operating its fulfillment operations. Find and discuss gaps and agreement among academic literature and empirical data.
- Create a guideline for businesses that are working with an online channel and perishable food products. This guideline can help these type of businesses to improve their supply chain and logistic operations, and stay competitive in their marketplace.

The research questions for this study are the following:

**1. Which SC configurations are been use for businesses that offer perishable food product through an online channel?**

In this question, it will be necessary to describe and explain how the supply chain of a retailers and independent business working with an online channel are been organized, and the way these type of businesses are organizing its distribution until reach end consumers. To make this question more valid, it will be require take into account the information gather from the two case companies.

Furthermore, information related with perishable food products and its special conditions will be describe, since this kind of products require more efficient SC.

**2. How fulfillment operations of an online channel are been operated when offering perishable food products to consumers?**

For this question, empirical data from real companies will be describe using as a base two Norwegian companies that offer perishable food products online. This question also will cover and analyze how these companies are managing its fulfillment operations when selling these type of products online to final consumers.

Logistic operations that will be analyze will be in relation to “order fulfillment operations”: supply management, information sharing among collaborators, replenishment policy (purchasing process), FC conditions, picking and packing operations, delivery service, service quality and customers’ requirements.

**3. Which logistic operations business working with an online channel need to focus on to stay competitive?**

The purpose of this question is find a solution for this study, and combine theory that reveals the importance of key logistic operations when managing an online channel, together with information found into the companies that offer perishable food products online. In this question, operations related with supply chain and order fulfillment operations should be addressed to support the development of the “Guideline” from this study.

### 1.3 Scope and Limitation

The scope of this paper, is primarily inspired by the perspective of online retailers, “e-tailers” and businesses that offer food products online to final consumers. Additionally, this study focus explicitly in the distribution of physical products through an online channel until reach the end consumers, rather than focus in the online channel as a business or marketing service. These are the three main areas that have been considered for the scope of this study:

The **first is related with the Supply Chain configuration** (Min and Zhou, 2002) of an online channel. This should take into account its distribution network (Chopra, 2003), the structure of its SC and identify their main members from a pure online player (Xing and Grant, 2006) or an independent business that sell products online to end consumers. As well as, real SC models that represent the SC of retailers with an online channel “E-tailing supply chain” (Kumar et al., 2014).

In order to have an optimal and profitable supply chain is required that SCM consider factors like: distribution and inventory location, access to demand, supply management, procurements and outsourcing, collaboration among SC members and technologies to share information (Georgiadis et al., 2005, Waters and Rinsler, 2014).

The **second area is related with order fulfillment operations from a Fulfillment Center (warehouse)**, these logistic operations are key for an online channel. In this part, online retailers (e-retailers) and independent businesses will be consider as the main seller for final consumers. A relevant framework use for this area of the study is the framework developed by Agatz et al. (2008). This framework presents operations related with the fulfillment process in 4 supply chain stages (purchasing, warehousing, delivery, and sales), academic research in fulfillment operations and the impact of the online channel in a SC. Johnson and Whang (2002) have also restated the importance of procurement and collaboration in an online business (e-business). Besides, other researchers have restated the importance of the picking operation (Boyer and Hult, 2006, Boyer and Hult, 2005, De Koster et al., 2007) considering an online channel perspective, the importance of the delivery service from a fulfillment center (Xing and Grant, 2006, Xing et al., 2010, Boyer and Hult, 2006, Kumar et al., 2014) and how these operations affect customer service level.

The **third area is related with perishable food products**, their characteristics and logistic requirements to preserve its quality and freshness, challenges that can arise when managing high perishable food products (Georgiadis et al., 2005, Amorim et al., 2012) online and special conditions required to manage such products.

As mention previously, two case studies will be conduct using as a base the Norwegian market and businesses that currently are selling food products through an online channel.

This study will not address supplier and manufacturing stage neither environmental nor ecological impact of the online and traditional channel. The management of return policies within an online channel are out of the scope of this study due to the extensive research studies within this field, together with the customers purchasing process online, and detailed transportation planning.

## 1.4 Thesis Structure

This master thesis consists of seven chapters. The contents of these are briefly described in the following table.

**Table 1: Thesis structure**

Chapter 1 <b>Introduction</b>	This chapter describes the background for this study, and the relevance of it. It contains the problem statement, objectives, scope and limitations of the study.
Chapter 2 <b>Methodology</b>	This chapter presents the research methods used in this study. How these will support the collection of data for the different research questions and their advantages and limitations.
Chapter 3 & 4 <b>Literature Study</b>	Chapter 3 provides an overview of the theoretical framework of this study. It starts describing the distribution channel concept, the differences among channels, customer types when working with different channels, considerations when working with an online channel, their target customer and details about its expectations when buying food online. Chapter 4 will cover how the supply chain and fulfillment logistics operations are being operated in an online channel.
Chapter 5 <b>Empirical Cases</b>	This chapter describes two Norwegian companies that are working with an online channel and perishable food products, and how they are managing its supply chain and order fulfillment operations.
Chapter 6 <b>Findings</b>	This chapter presents main findings from the empirical cases; it analyzes them in the view of the studied literature. It also represents the main background for the development of the framework of this study.
Chapter 7 <b>Discussion &amp; Guideline</b>	This chapter presents the solution of this study, discussion of the findings a description of them, implications for practice, limitations and detailed suggestion for further research
Chapter 8 <b>Conclusion</b>	This chapter contains the degree to which the research questions have been answered the research questions together with the study objectives. It also contains limitation found during the study, knowledge acquired and gives suggestions for the future research.

## 2. Methodology

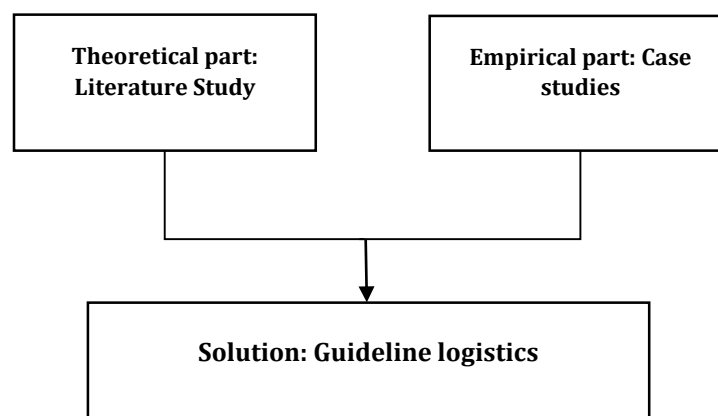
*This chapter will described the choices made with respect to the methodology used. This thesis has been carried out as a research-based project consisting of a theoretical part and empirical cases. To begin with, a general methodological research is presented, followed by the description of the different methods used, their advantages and limitations, as well as how these methods will support the research questions from this thesis.*

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This study has been accomplished based through theory and empirical evidence obtained from a literature study, previous semester project and data obtained from two case studies. The literature study has brought to this thesis important information on the research area, which has been used to discuss details of the study cases.

In general, research methodology consists of using methods and available sources to solve problems, it includes procedures and techniques that support researchers to collect, describe and analyze relevant data that will be used to support the phenomena in study (Karlsson, 2009). Together, information from theory, empirical and case studies will be use to answer research questions and objectives from section 1.2.

The literature study has been use as the main source to answer RQ1 & RQ3, while the empirical method together with the theoretical part have been the sources to answer the three main questions of this thesis.



**Figure 2: Research methods of the master thesis**



Figure above presents research methods that will be use in this thesis. Detailed description of the research methods used in this study will be explain in the following part.

## 2.1 Theoretical method

In this part of the study a literature study research to be completely familiar with the investigated phenomenon has been done, as well as the description of how different researchers have approached this topic.

Another reason to develop a theoretical framework is to support what has been explored in the case studies, create an interview guide and explore and describe theories related with the investigated phenomena(Yin, 2011).

The purposes of make such theoretical background is have a solid and strong foundation for establishing the importance of the study. For these reasons, the research questions and the scope of this study have been readjusted while doing the literature reviewed. During the literature study new knowledge has been acquired and help to define different topics that needed to be approached to make this theoretical part significant for the thesis.

The focus areas in the literature study were defined based on the research questions and the problem description. After the topic of the study was defined, a group of key words were identify in Table 2. Additionally, words from both columns were used separately or in connection to find information.

**Table 2: Key Research words**

Key words		Supportive words	
Marketing channels	Purchasing	Food online	Business Model
Distribution channels	Picking operations	Traditional supply chain	Food requirements
Online channel	Service quality	E-commerce	
Perishable products	Customer service	Dual distribution	
Supply chain	E-supply chain	Traditional customers	
Supply chain management	Retailers	Fresh products	
Fulfillment strategies	Competitive advantage	Customers' requirements	
E-fulfillment	Logistics	Perishability	
Order fulfillment process		Product quality	
Online customers		Competitive strategy	
Delivery service		Warehouse operations	
Last mile delivery		Information sharing	

Research of key words shown in table 2 were made in several databases: Oria, Google Scholar, Science Direct, ProQuest and NTNU BIBSYS.

After relevant words were established, many papers were found. In terms of literature choice, no preferences were given to particular scientific papers, since the main topic in study is relatively new if compared with other fields of logistics and supply chain management. One of the aims of this study is find as much as possible in relation with: the online channel, its logistics, customers' expectations when buying food online and requirements of perishable food products.

Snowball sampling technique(Matthews and Ross, 2010) was use to select many of the reviewed papers. Additionally, references from these papers were used to find new sources in this study and complete the theoretical part. After finding a group of primary papers, preferences were given to peer-reviewed articles and scientific journals. Limitation of this study is on the dependence on previous published research.

Moreover, the literature reviewed reveal key papers that investigate the impact of the online channel in SC and logistics. One of the main papers, is the study made by Agatz et al. (2008) where they described e-fulfillment and multi-channel distribution. Kumar et al. (2014) research has been use to describe SC models when operating an online channel. Additional papers were chosen (Xing et al., 2010, Xing and Grant, 2006, De Koster et al., 2007, Boyer and Hult, 2006, Tarn et al., 2003) to analyze the fulfillment processes (order fulfillment operations). Through a review and analyze of the documents, key points of the different papers will be restated in combination with findings of the two case companies since this papers provide a foundation for establishing the solution of this study.

## **2.2 Empirical Method**

Preliminary literature review was made before doing the interview with the companies in study. According Yin (2011), case study research is the preferred method in situations where the main research questions are descriptive questions “what is happening or has happened?” or an explanatory question “how or why something happen?”, the researcher has little or no control over behavioral events and the focus of the study is contemporary (as opposed to

entirely historical) phenomenon. A case study research, has as an objective to understand in depth a “single or a number of cases” in the real world context, especially when limits among phenomenon and scientific literature are not evident (Yin, 2011). In the same way Yin (2011) has restated that one of the drawbacks of case studies is the lack of trust in the credibility of a case study researchers’ procedures. The more cases, the greater confidence of the study, the fewer cases the less study certainty.

The objective to choosing a case study research , is to support the three research questions of this thesis, and verify how the management of supply chain and fulfillment operations present in academic literature agree or disagree with those companies that are offering perishable food products online. The reason why two company case companies have been chosen for this study is to improve the validity of this study. However, further research on companies that work with an online or multichannel strategy can be studies in the future in order to support and reinforce the validity of this study.

The two companies chosen are in the scope of the area of research of this study. Both are Norwegian players that offers perishable food products online. In addition, both companies sell food products with different characteristics and operate in different regions of Norway. In order to make this part of the study, the case studies will include information collected during the first meeting and the semi-structured interview and information found in its webpages. According to (Yin, 2013) data triangulation allows to secure the construct validity of the cases in study, since its combines independent sources of evidence to support the study(Yin, 2011).

### **2.2.1 Semi-structured interview**

According to (Drever, 1995) interviewing is one of the most common methods to collect data in case studies. In the same way he restates, that semi-structured interviews create a general structure by deciding in advance the topics to be covered and the main questions that will be ask. This method allows the participants have a fair degree of freedom in what to talk about, how much to say, and how to express it. Besides, Matthews and Ross (2010) stated that semi-structured interviews follow a set of topics or questions for each interview, but may allow to introduce the questions or topics in different way as the interview take place. According to

(Yin, 2011) one of the benefits of this kind of interview is that it can offer extensive material than data from survey, however this method can consume more many hours for one case study due to its flexible format.

In brief, this interview aims to find out which SC configurations businesses that operate with perishable food products online are using, and discover how these are managing its fulfillment operations.

Reasons why semi-structured interview was chosen are the following (Matthews and Ross, 2010):

- Allow the interview to keep a conversation about the topic of interest and find information for the questions in study.
- There is not a need to follow the questions strictly, it allows the interview to accommodate the questions according to the interview flow.
- Allows a researcher to explore different aspects of the phenomenon and identify aspects that at the beginning were not considered.
- Interviews can be adapted to the different participants
- Additional question can be included while doing the interview.
- Face to face interviews that enable the interviewer see the reactions of the participants.

On the other hand, the main limitation connected to these interviews was time, since only one interview was conducted in each of the companies.

According to (Yin, 2011) semi-structured interview presents limitations in relation with:

- Lack of rigor of the case study research.
- It has little or no generalization value. A single or a small set of cases cannot lead to scientific generalizations.

Likewise, Matthews and Ross (2010) highlight the following:

- Researcher needs to develop interview skills as well as dependent of interviewer with knowledge of the topics in study.
- Participants can lead the interview to other topic that are not part of the research.

- Interviewer may give clues that will guide respondent to give answers expected by interviewer.

Additionally, an interview guide was develop to help the participants and the interviewer to remember the different topics that needed to be covered (Appendix A). Both interviews were recorded with the authorization of the participants, in order to remain the validity of the information gather and to develop accurate and quality case studies.

The information from these interviews were summarized in the case descriptions presented in Chapter 5.

### 3. Theoretical Background

*The purpose of this chapter is to give an overview of the theoretical part of this study, it reveals considerations that online channel should take into account when working with perishable food products. This information supports in part RQ3. Additionally, this chapter explores in detail what is a distribution channel, the differences between channels and its characteristics. Afterwards a more detailed description of the online channel when handling food products will be address. In chapter 4, SC and OFO from an online channel perspective will be define. All this information will be use as a base to set the boundaries and the scope of this study, as well as to develop a theoretical framework for the case studies and solution of this thesis.*

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E-commerce and Internet retailing is one of the main inventions that Internet has brought. Nowadays, is common to see many retailers and businesses that are starting to offer their products outside the traditional channels and are starting to operate online. On the other hand, is also common to find several companies that are starting to offer their products through more than one channel. These market trends are changing the consumers purchasing behavior and are starting to represent diverse ways to operate the different distribution channels.

This literature study has been realized to outline main findings related with RQ1 and RQ3, as well work as a foundation to develop chapter 4, 5, 6 and 7 of this study.

#### 3.1 Distribution channels strategies

Currently many retailers, groceries and independent businesses are operating with an online channel to offer their products. Nowadays is very common than regular consumers order products via Internet(Johnson and Whang, 2002, Kumar et al., 2014), which mean that the use of this channel is growing.

On the other hand, there are still many retailers and independent business in the world that still keep working with a traditional distribution channels (regular stores, catalog and others channels)(Rosenbloom, 2007). This is mainly because it's part of their traditional business

strategy and because working with a new distribution channel will imply changes for its businesses strategy and consequently an economic investment.

In general, a retailer could be defined as a business that sells goods directly to consumers, through different channels. Traditionally, retailers used to offer their products through regular stores, nevertheless, Internet has modify the consumers way to purchasing goods (Kumar et al., 2014, Yang and Wu, 2007). This massive and global computer network has force many “conventional” retailers and businesses to modify the way to sell its products.

Kumar et al. (2014) have mentioned that “Internet retailing” is a new format that some retailers have adopted as a consequence of the e-commerce evolution. This new generation of retailers known as “e-tailers” are retailers that offer services or products to consumers via Internet. Examples of these e-tailers in Norway are Nelly.com, and Komplet.no.

On the other hand, groceries retailers are those retailers that mainly offer perishable and non-perishable products to end consumers. In this case, an example of perishable products could be food products and flowers, whereas nonperishable could be beauty-care products, magazines, clothe and others.

When grocery retailers and independent businesses that offer perishable products decide to start operating with a specific marketing channel, their main objectives should be satisfy the need of their target customer and make its business profitable. In order to accomplish these goals, is important for them to decide which distribution channel they will use to make their products available for their consumers.

According to Peterson et al. (1997) marketing channels are consider means of communication, transaction, and distribution. Moreover, a distribution channel, can be defined as a group of organizational units, that carry out functions to make products or services reach the consumers (Banyte et al., 2011). A typical distribution channel can consists of one manufacturer and one retailer (Ahmadi-Javid and Hoseinpour, 2012, Yang et al., 2013). However, a distribution channel can also consists of several suppliers, wholesalers, distributors, retailers, stores and independent sellers. Typically, this is the case of traditional grocery retailers, since many of them have several suppliers, and one distribution channel or

a combination of them to interact and sell their product to the final consumers. These channels can be operated via Internet (online) or offline (traditional channels).

For these reason, and to make the products available to the final consumer, it is important than independent businesses and retailers to manage their distribution channel efficiently and develop responsive and flexible supply chains, since supply chain management considers the entire logic of the logistics upstream to suppliers and downstream to final customers (Christopher, 2010). In the same way SCM is based on the idea of developing strategic partnership in the distribution channel and develop high degree of collaboration among the members of the channel(Christopher, 2010). As it can be notice, distribution channels and supply chain management are two functions that are highly interrelated, since the objective of both its to fulfilled customers' requests (Chopra and Meindl, 2010, Rosenbloom, 2007, Frazier, 1999) in an efficient and responsive way.

In other words, logistics operations have as a goal support the development of the different distribution channels and improve its flexibility(Aldin and Stahre, 2003), therefore, supply chain management and logistic like supply management, delivery service and warehouse operations have become an integrated part of the distribution channel development.

Thus, when grocery retailers and independent businesses decide to choose a specific distribution channel they must analyze and identify the logistics required (fulfillment strategies and distribution processes) to make their products available to their customers. Choosing an appropriate distribution channel and proper logistic operations will make these type of businesses satisfy their customers, reach profitability, and gain competitiveness.

Another important consideration that retailers and independent businesses must take into account when selecting a distribution channel is the type of product that they will sell to their final consumers. Since some products will required more efficient and flexible supply chains than other types of products. Such is the case of food products like fresh food and vegetables that tend to have short shelf life and a high degree of perishability (Blackburn and Scudder, 2009).

In order to make and efficient channel selection, several researchers have suggested different criteria and models to select a specific marketing and distribution channel. Many researchers



have restated the importance to take into consideration customer's needs (Stern and El-Ansary, 1992, Kotler and Armstrong, 2010), while Banyte et al. (2011) have also restated that there are other models that do not stresses the importance of consumers' needs, instead these highlight the selection of marketing and distribution channel according to the company needs.

One of these models, is the one developed by Berman (1996), here he presents 6 steps that explain the process of marketing channel formation: 1. Determining channel objectives 2. Evaluating the channel characteristics and types of intermediary requirements, 3. Evaluating market, product, company, and intermediary factors that affect channel length, 4. Assign channel tasks among the different channel members, 5. Selection of specific channel resellers, 6. Revising channel elements and plans. This framework seems to be pretty assertive when choosing a distribution channel, since it considers customers' needs together with company goals and product characteristics. In the same way Agatz et al. (2008) have restated that nowadays companies need to consider customer needs in their processes, since they will impact its marketing and operations capabilities. Customer requirements should be one of the main priorities of businesses when choosing a specific distribution channel.

Finally, when companies have decided which distribution channels they will use, they should also take into account its capacities, limitations and business main objectives. Choosing several distribution channels can lead companies to satisfy a wider range of customer, and increase its competitiveness and market share (Banyte et al., 2011). On the other hand, having several channels can make companies to incur in extra cost (Müller-Lankenau et al., 2006) like for example increasing their distribution cost and infrastructure costs. Additionally, businesses should also consider conflicts that might arise among the channels or the synergies that can be produce between them (Rosenbloom, 2007, Müller-Lankenau et al., 2006, Kumar et al., 2014, Steinfield, 2002, Steinfield et al., 2002, Sharma and Mehrotra, 2007). Hence, when retailers and independent businesses want to implement several marketing channels is important they to analyze how the different distribution channels will help them to achieve their business goals and the impact that they will have in their consumers.

To sum up, the main goal of a distribution channel should be make products available for the consumers whenever are needed. Distribution channels selection process has a big impact when reaching business goal and customers' satisfaction, since choosing a specific distribution or a mix of channels can help retailers and independent business to reach a few consumers or several of them. In the case of grocery retailers and businesses that sell food products to end consumers, they should be able to investigate what are the requirements and expectations of consumers when buying food products and which benefits and disadvantages the different distribution channels can offer to them. Additionally, they should analyze the reasons of why the consumers use different types of distribution channels, products specific characteristics, and how their logistic and supply chain should be operated to keep products conditions and satisfied customers. Further, the characteristics of the different distribution channels will be cover.

### **3.1.1 Differences among channels**

Marketing and distribution channels typically include traditional store, online stores, catalogues, sales force, third party agencies and call centers (Neslin and Shankar, 2009, Pan et al., 2002). As has been mention before, the main goals of a marketing channel should be have the right products, in the right amount, at the right place for its customers (Mentzer et al., 2001, Frazier, 1999). Having different channel options, allow the consumers the opportunity of choosing the channel with the best processes and services (Yan, 2010, Dumrongsiri et al., 2008), and choose the one that is more convenient for them.

Some researchers have suggested that fast movers products suit better for a physical channels, whereas slow movers suits better for an online channel (Agatz et al., 2008). An example of fast movers products could be flowers and perishable products, while slow movers could be electronics (Yan, 2010, Enders and Jelassi, 2009) shoes and jewelry.

In the present, many retailers are offering books, food, electronics, clothes, shoes and other types of products (Enders and Jelassi, 2000) through and online and traditional channels. An example of these retailers are Walt-Mart, Target, Tesco and Amazon.

According to Müller-Lankenau et al. (2006) the Internet (online) channel can reach efficient distribution costs for those digital goods. On the other hand, the same authors restate that for

other good like perishable food products, online channel might be less cost efficient. In the same way, Enders and Jelassi (2009) have restated that distribution cost for perishable products tend to be higher than for other type of articles due to bulky volumes and the perishable nature of the products. With this context in mind, it is possible to assume that the online channel suits better for electronics than for food, while regular shops work better for food products. Even though it might see challenging the cost related with perishable food products in an online channel, it is a fact that in the present many retailers and independent businesses are offering these type of products online, mainly due to consumers' expectations and the competitive food market. For these reasons, and to accomplish competitiveness in the market, firms need to be able to develop a competitive strategy and be able to manage market uncertainties while guaranteeing an excellent service level (Stritto and Schiraldi, 2013). Competitive strategy concerns on how to create competitive advantage in each of the markets in which a company plays (Beckman and Rosenfield, 2008) and how its marketing and distribution channels should be operated.

According to Porter (1985) competitiveness can be achieved by one of following the strategies:

- ✓ Cost leadership: A firm has cost advantage if its cumulative cost of value activities is lower than the competitors' cost. This strategy can be achieved by a cost control driver strategy or by reconfiguration the supply chain.
- ✓ Differentiation: a firm could deliver a unique set of products or services compared to its competitors, when keeping this differentiator strategy, a firm should achieve costs proximity to its competitors.
- ✓ Focus or niche strategy: a firm could serve a narrow segment of the market, product lines or geographic segments. This strategy is applicable to both cost leadership and differentiation.

In the same way (Porter, 1985) reiterates that firms should make a choice about the type of competitive strategy they are seeking to attain, and plan how they will achieve it. Trying to lead in several of these strategies can affect the performance of a marketing and distribution channel, since it can make the company lose competitiveness in the market where is operating. Thus, having the proper distribution channels and supply chain operations together with a clear competitive strategy can help businesses to achieve competitiveness.

In the case of retailers or independent business that offer food products, they could implement a differentiation advantage that can help them reach competitiveness, for instance improving their delivery services or personalize services. However, implementing a strategy purely focus in meeting customer needs can pressure businesses total costs and specially the cost related with its distribution (Waters and Rinsler, 2014). In the case of traditional retailers, they usually focus in a cost leadership strategy or in the differentiation strategy. On the other hand, grocery retailers that have a multichannel strategy need to find ways to support channels operations and avoid conflict between parties, since this may lower the profits of the entire business (Yan, 2010).

Figure no.4, presents the configuration of a traditional channel, online and multichannel strategy.

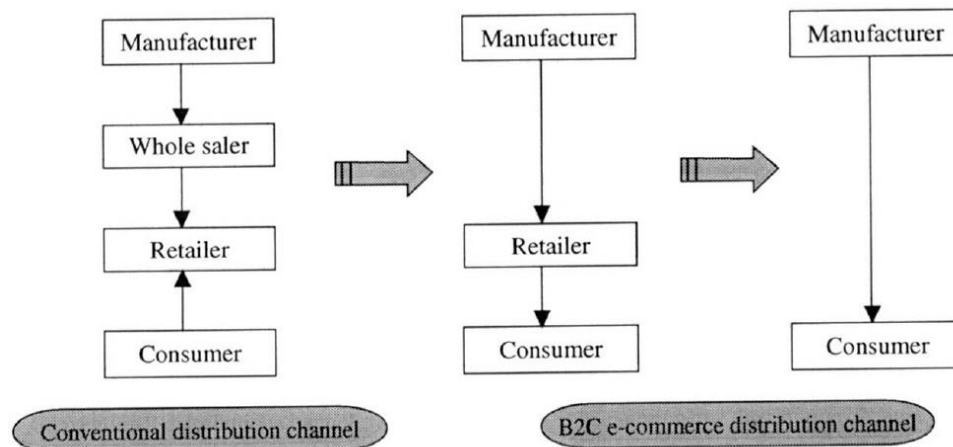


Figure 3: Disintermediation in the transformation of a conventional distribution channel to a B2C e-commerce channel (Xing and Grant, 2006)

Figure above presents a general overview of how the SC of the different distribution channels are configure and the amount of collaborators that each channel can have. Is important to restate that this is a general view of the different channels. Usually, businesses manage different number of suppliers and consumers. However, all of them require efficient SC and logistic operations to make products available to consumers whenever these place an order. Typically, the different channels differ in some way in the way to operate its supply chain, and logistic operations(Agatz et al., 2008).

Commonly, a **traditional channel** refers to those channels that operate in a physical space, rather than through Internet.

On the other hand, and **online channel or e-channel** considers a scenario where the manufacturer or retailers receive orders directly from the final consumers (Disney, Naim, & Potter, 2004) for later deliver the product to the consumer, here the product is not immediately available for the consumer. In this channel the consumers must wait and arrange the time and day to receive the product requested. Although Internet shopping makes consumers to wait longer for their products, the use of this channel is becoming increasingly popular and has made many retailers to implement this alternative distribution channel (Ofek et al., 2011) in their business strategy. Every day the number of consumers that are using this channel is increasing (Kumar et al., 2014, Ofek et al., 2011, Agatz et al., 2008), for this reason many businesses have started to working with it.

One of the opportunities that the online channel offers, is that it allows businesses to know its consumers, observe their environment, wishes and behavior (Banyte et al., 2011). In the same way, these authors have restated that another advantage of this channel is that it can help retailers and other businesses to receive direct feedback from consumers and find out what consumers wish and what they expect. Furthermore, “**E-tailing**” consists of a format that uses an Internet base store for retailing which uses more radical retail operations of those that operate through a bricks-and-mortar stores (Kumar et al., 2014, Kumar et al., 2010).

Another of the main advantage of the Internet channel, is that it allows consumers to check a variety of products and a wider range of products (Brynjolfsson et al., 2003). Typically, an Internet channel can be more powerful than a traditional channel in the sense that it provides immediate information to the customers allowing them to reduce its searching cost (Agatz et al., 2008).

When referring to pure online grocery retailers and businesses that sell food products online. Online grocery shopping (OGS) refers to the use of retailers websites to purchase grocery products or specific food products through Internet(Kurnia and Chien, 2003). Online grocery presents issues(Scott and Scott, 2008) that must be consider in order to be successful. This is mainly due to the nature of the products and customers’ expectations. Usually, perishable products require more logistic considerations to preserve is quality than other types of products.

Moreover, a **multichannel strategy** considers a set of activities involved in the selling of products or services to consumers, through more than one channel. “Bricks and clicks” refers to those retailers that supplement its conventional stores with an online channel (Burt and Sparks, 2003). Seen from another perspective the multichannel strategy, it’s the combination of an online channel with an offline channel. In general, a “Multi-channels strategy” could include physical stores coupled with mail-catalogs (e.g. J.C. Penney), or physical stores coupled with online-stores (e.g. Circuit City, Staples), kiosks, or wireless channels (e.g. kayak.com), or a combination of all the ones mentioned above. In brief, a multichannel strategy satisfies different customers and provide a higher service (Rosenbloom, 2007, Rangaswamy and Van Bruggen, 2005) since it cover several marketing and distribution channels. Usually, this strategy allows customers to choose the most convenient channel for their needs(Sharma and Mehrotra, 2007) and decide when and how long they will wait for their products or services.

As shown above there are 2 main distribution channels commonly used by businesses and retailers: these are the traditional channel and the online channel. The combination of both is known as a multichannel strategy. These different channel strategies present diverse characteristics that suit better for some articles than for others. However, in the present world trends, the using of an online channels is becoming more popular in several industries, including those business selling food products. When these type of business pretend to use the online channel or both channels, businesses need to analyze how the channel chosen will allow its business to reach competitiveness, satisfy its customers and the impact of using each of the different channel strategies. Thus, when independent business and retailers decide to offer perishable food products online they should be able to select one competitive strategy and the logistics operations that this strategy can required to work properly. Business that manage perishable food products need to be aware that different competitive strategies will makes them pursue different objectives and types of customers. Thus, the more advantages the firm presents, the more customers it will have and potentially more profit. In the same way, is important to restate that when these retailers are managing perishable food products supply chains operations become more complex and dynamic to manage. Therefore making the right selection of distribution channel/s and the proper identification of Supply chain

operations together with other logistics can lead business managing food products to have a good presence in the market where they are operating and provide a high service level.

Table 3 shows a set of the advantages and disadvantages of the different distribution channels, since these different channels, require business to operate and manage its SC and logistics in a specific way.

**Table 3: Advantages and disadvantages among different marketing and distribution channels**

<b>Channels</b>	
<b>Online</b>	<p><b>Advantage:</b></p> <ul style="list-style-type: none"> <li>• Large range of products(Agatz et al., 2008, Frambach et al., 2007, Kauffeld et al., 2012, Rosenbloom, 2007)</li> <li>• Flexible and responsive (Banyte et al., 2011, Agatz et al., 2008)</li> <li>• Able to follow customer trends and purchasing behavior (Rohm and Swaminathan, 2004, Banyte et al., 2011, Gupta et al., 2004)</li> <li>• Products at any time, time saving and convenience(Enders and Jelassi, 2000, Gupta et al., 2004, Grewal et al., 2004, Ofek et al., 2011)</li> <li>• Less physical investment (absence of a physical infrastructure) (Enders and Jelassi, 2000)</li> <li>• Efficient distribution(Banyte et al., 2011; Rohm &amp; Swaminathan, 2004(Agatz et al., 2008, Gupta et al., 2004, Xing et al., 2010)</li> <li>• Availability of products information and characteristics (Frambach et al., 2007, Brynjolfsson et al., 2003, Kollmann et al., 2012, Rohm and Swaminathan, 2004, Grewal et al., 2004, Gupta et al., 2004, Agatz et al., 2008)</li> <li>• Flexibility in locating inventories and wider product variety (Randall et al., 2006, Agatz et al., 2008)</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Higher distribution and handling costs (Lummus &amp; Vokurka, 2002 )(Grewal et al., 2004, Enders and Jelassi, 2009)</li> <li>• Intangibility of the goods and services (what cannot be seen, tasted, felt, heard, or smelled)(Laroche, Yang, McDougall, &amp; Bergeron, 2005 )(Grewal et al., 2004, Scott and Scott, 2008, Ofek et al., 2011)</li> <li>• Difficult return policy (Agatz et al., 2008) difficult return policy can cause the seller to lose their sale and dispose the product(Ofek et al., 2011)</li> </ul>
<b>Offline</b>	<p><b>Advantage</b></p> <ul style="list-style-type: none"> <li>• Personal contact with the consumer (personal advice from a salesperson) (Agatz et al., 2008) (Frambach et al., 2007, Rohm and Swaminathan, 2004, Enders and Jelassi, 2000) face to face contact with the consumer (Ofek et al., 2011)</li> <li>• Immediate possession of the goods (touch and feeling sense of the product) (Enders and Jelassi, 2000, Agatz et al., 2008, Kollmann et al., 2012, Gupta et al., 2004, Rohm and Swaminathan, 2004)</li> <li>• Easy return policy, due to physical locations(Enders and Jelassi, 2000, Kauffeld et al., 2012)</li> <li>• Physical presence and recognize name(Enders and Jelassi, 2000, Agatz et al., 2008)</li> <li>• Shopping experience (Enders and Jelassi, 2000, Rohm and Swaminathan, 2004)</li> <li>• Developed distributions and physical structure(Albrecht Enders &amp; Jelassi, 2000)</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Fewer variety of products(Payne and Frow, 2004)</li> <li>• High sales forces cost (Enders and Jelassi, 2000)</li> <li>• Substantial investment in infrastructure (Enders and Jelassi, 2000)</li> <li>• Limitations of opening hours(Enders and Jelassi, 2000, Rohm and Swaminathan, 2004)</li> <li>• Costs associated with product return (Ofek et al., 2011)</li> <li>• Inefficient services (Agatz et al., 2008)</li> </ul>
<b>Multichannel</b>	<p><b>Advantage</b></p> <ul style="list-style-type: none"> <li>• Wider customer range- multiple customer segments(Sharma and Mehrotra, 2007, Kollmann et al., 2012, Banyte et al., 2011, Kumar and Venkatesan, 2005)</li> <li>• More profit and sales (Neslin &amp; Shankar, 2009; Sharma &amp; Mehrotra, 2007(Kumar and Venkatesan, 2005)</li> <li>• Synergies among channels(Sharma and Mehrotra, 2007, Neslin and Shankar, 2009, Steinfield, 2004, Rosenbloom, 2007)</li> <li>• One channel can enhance sales through another channel (Pauwels and Neslin, 2008, Payne and Frow, 2004, Rosenbloom, 2007)</li> <li>• Different channel options for different customers (Rosenbloom, 2007)</li> <li>• Economies of scale from the integration of both channels (Agatz et al., 2008)</li> <li>• Options of product returns via offline stores (Agatz et al., 2008, Ofek et al., 2011)</li> <li>• Customized services due to management of several channels (Agatz et al., 2008)</li> <li>• Increase customer loyalty due to channel variety (Boehm, 2008, Yong-zhi, 2014)</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• Conflicts among channels(Sharma &amp; Mehrotra, 2007)(Agatz et al., 2008, Webb, 2002)</li> <li>• Increase of general costs, which decrease company return. (Sharma and Mehrotra, 2007, Chu et al., 2007)</li> <li>• Channel cannibalizing (Kollmann et al., 2012, Rosenbloom, 2007)</li> <li>• Requires significant investment in infrastructure involving capital and human skills (Rosenbloom, 2007)</li> <li>• Complex and dynamic SC (Rosenbloom, 2007, Aldin and Stahre, 2003, Agatz et al., 2008, Metters and Walton, 2007) (Kollmann et al., 2012, Rosenbloom, 2007)</li> <li>• Conflicts in fulfillment operation, store pickers can affect independent customers (Agatz et al., 2008)</li> </ul>

In brief, table above shows the different channel advantages and disadvantages. To accomplish most of their advantages, retailers and independent businesses require a good and an effective planning of their SC and logistics.

### **3.2 Considerations of an online channel that deals with perishable food products**

In chapter 3.1, a general description of the different marketing and distribution channels that retailers and independent business commonly used was presented, and an outline of its main characteristics, since its important to know which advantages and disadvantages the different channels had when working with them. Currently all of them are being use in the market. Still, the scope of this study is mainly in the online channel and its logistics operations, for these reasons a detailed analysis and description of it will be address in the following sections.

As has been mentioned previously, customers' expectations and product characteristics are critical factor that need to be considered when choosing a specific distribution channel. In the case of those retailers and businesses that sell food products online, is very critical for them to discover which are the expectations of their customers when buying food online and which are the requirements that perishable food products need in order to preserve its characteristics. As well as, how its supply chain and logistic operations need to be perform to satisfy their customers and to keep a high service level. For those reasons, the next sections of this chapter will provide detailed information of customers' expectations when buying in an online channel, perishable food products characteristics, expectations of consumers when buying food products online and logistic considerations that businesses and retailers require in order to provide quality and fresh product to its buyers. Additionally, these topics will support the conceptual framework of this study and the development of the rest of the chapters of this thesis.



### 3.2.1 Consumers' expectations when buying in an online channel

In order to be able to make any distribution channel successful is important than retailers and businesses take into consideration the expectations of its customers. With such distribution channel diversity, is logic to think that customers present different expectations (Neslin and Shankar, 2009) and needs when choosing a specific distribution channel.

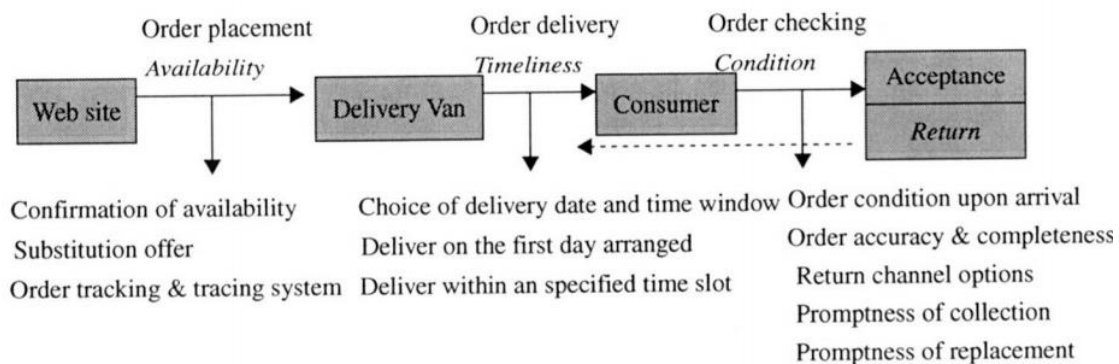
In general when customer buy products in any channel what they are expecting is to find the product they want, a good service and a rapid order fulfillment process (Anderson et al., 1997). In the same way (Anderson et al., 1997) restated, that primarily, each channel should be able to present different services, and service level agreement for the specific customers' they pretend to serve. According to (Stern and El-Ansary, 1992) four main services are required by a consumer, these requirements are: time of delivery, convenience of the place, size of the purchase and range of products. Besides, Juščiū and Snieška (2008), have restated that is becoming common that the decisions of consumers when purchasing products, appear being influenced by environmental aspects, social responsibility of producers and its intermediaries.

For instance, if we consider offline consumers or store-oriented consumers, their main motivation when buying products in a conventional channel (store, boutique) is the desire for immediate possession of goods and social interaction (Rohm and Swaminathan, 2004), preference for going to a regular stores (Farag et al., 2006, Hansen, 2008), touch and select the products they want, and receive help from employees (Kollmann et al., 2012).

On the contrary **online consumers (e-consumers) or regular online shoppers** (Enders and Jelassi, 2009) look for benefits like time savings and convenience (Anckar et al., 2002, Morganosky and Cude, 2000, Farag et al., 2006, Hand et al., 2009, Banyte et al., 2011, Boyer and Hult, 2005), or personal circumstances like: health problems or newborn moms (Hand et al., 2009, Morganosky and Cude, 2000). Likewise, many researchers have found that one of the main reasons that makes consumers chose this channel is related with the delivery service to its location (Anckar et al., 2002, Agatz et al., 2008, Xing et al., 2010, Xing and Grant, 2006, Anderson and Lee, 2000, Lee and Whang, 2001, Warschun, 2012), or convenience of picking their products in an existing store (Galante et al., 2013, Waters and Rinsler, 2014,

Stritto and Schiraldi, 2013, Agatz et al., 2008). Rohm and Swaminathan (2004) had also suggested that there are other motivations that make consumers to pick the online channel. These motivations are: accessibility to information, social interaction with people with the same interests, shopping as a leisure experience, product variety, and desire for obtaining new and different products. When customers buy products online the customers buy a bundle of physical products, delivery service and possible other after sales services(Agatz et al., 2008) than just a product. Therefore, when business decide to operate with an online channel they need to be conscious that managing this channel also requires efficient logistics (SCM and OFO) in order to satisfy consumers.

Xing and Grant (2006) have developed the E-PDSQ framework through a survey tested in Scotland to online shoppers. With this survey, they were able to discover which dimensions are the ones that influence more shoppers to use an online channel. The 4 dimensions that they found were: availability of the product, timeliness which takes into account the time between placing the order and receiving the order, condition of the product when receiving the order, and easy return policy and replacement. Figure 5 presents (Xing and Grant, 2006) framework and a short explanation of how each dimension should work.



**Figure 4: An e-PDSQ framework from the consumer's perspective (Xing and Grant, 2006)**

In the same way, these authors also discover that the variable that most influence online shoppers is the price. Which means than consumers are becoming more price –sensitive in this channel. Even though this study was successfully proved in Scotland, there are still some markets, were consumers are less price sensitive when buying special products or services.

In such cases businesses and retailers should be able to offer to their target customers innovative and value adding activities-services (Agatz et al., 2008, Anckar et al., 2002, Sorescu et al., 2011) and customer oriented operations-services (Ganesan et al., 2009) that exceed their clients expectations and differentiate them from competitors. An example of these activities could be handling easy return policies and substitution of articles, delivery of the products at convenient times, having pick up points, apps or web pages that record items that are commonly purchased by the frequent customer, promotions, gifts and such others. If such value-adding activities are managed by business and especially for those that manage food, then they will be able to reach a competitive position in the market where they are operating. An example of markets where this is still possible is Norway, since currently it is possible to find businesses that are offering boxes with food, these businesses offering these type of products are growing and satisfying specific customer segments that are still less price sensitive.

Boyer and Hult (2006) have distinguished that there is an adjustment period for customers to adjust to the online channel. Customers are often uncertain of what to expect when buying products online for the first time, however, as orders are successfully delivered and well fulfilled this increases customer perception to continue buying through such channel and keep ordering products online. Further research, also shows that the more familiar becomes a consumer with an online channel, the more likely consumers will prefer that channel to make all their purchasing processes (Frambach et al., 2007).

In addition, Figure 6 presents other reasons that make consumers choose an online retailer (Xing et al., 2010) than a traditional retailer. This data was found by Xing et al. (2010), the purpose of this survey was to figure out the expectations of consumers that buy products online. A limitation of this survey is that it does not consider food products bought online. Still, it is possible to assume that some of the expectations found in this survey can be applied for food products purchased online. For instance, these expectations can be related with availability, good price, convenience, speed of delivery, special offers, recommendations and product range.

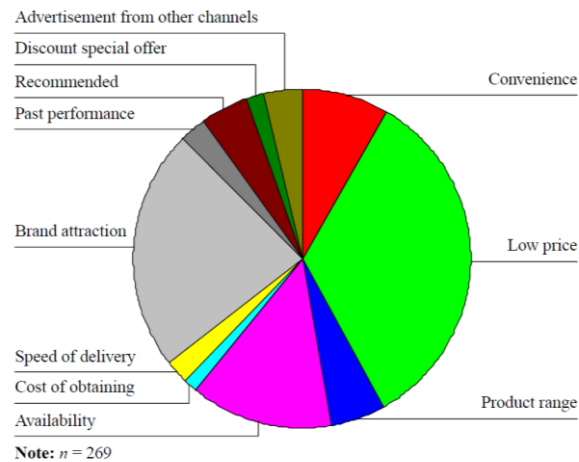


Figure 5: Respondents' reason to choose a particular e-retailer (Xing et al., 2010)

Nevertheless, there are still reasons that make consumers prefer physical stores rather than online stores, some of these reasons are that many times those costumers do not find the service convenient, service requires extra charges for the home delivery or simply because they don't know about the option of this alternative distribution channel (Warschun, 2012).

On the other hands, is important to restate that marketing channels are growing more every day, and people is having more access to Internet from different digital devices (Rangaswamy and Van Bruggen, 2005, Brynjolfsson et al., 2013, Kauffeld et al., 2012). Currently many consumers are becoming **multichannel consumers** instead of purely online or store-oriented consumers, this is because channels preferences vary between customers and during the different stages of the shopping process (Nunes and Cespedes, 2003, Rangaswamy and Van Bruggen, 2005, Sorescu et al., 2011). In the same way, several researchers have divided the purchasing process in different stages: pre-purchase, purchase and post-purchase (Laroche et al., 2005, Kollmann et al., 2012, Frambach et al., 2007, Neslin et al., 2006). To sum up, these authors have mentioned that during the purchase process many consumers use the online channel to find information related with the product they want to purchase (price, quality, availability etc.),but when they decide to make the final purchase, many of them prefer to go to the physical stores. The same authors have stated that such advantages are just possible when handling a multichannel strategy. Since when having different channels, each channel can focus in specific activities and services that will enhance value in the consumer's purchasing process. Sorescu et al. (2011) have exemplified this process by explaining that

generally what consumers do is use an online channel to check product information, when they have the information required they proceed to make the purchase offline and finally if problems occurs they require support via telephone.

In summary, when retailers and independent businesses intend to serve consumers with different expectations, it is important for them to analyze the advantages and disadvantages offered by the different channels and if the channels chosen match with its customers' expectations. A multichannel strategy could be more effective than a single channel strategy, since it is highly probably that businesses that manage more than one channel will be highly preferred than retailers or businesses than manage just one channel, however, conflicts among channels can arise, therefore is important for businesses to analyze how effective and profitable this strategy will be. On the other hand, the use of an online channel is growing everyday especially in the food industry, thus retailers and business working with an online channel need to take into consideration the nature and perishability of food products, since some of these products will require special conditions to keep its quality and freshness. Additionally, these businesses should be able to chase the expectations of their consumers when buying these type of products online together with the channel logistics requirements, all in order to make this channel to work efficiently.

Further, it is clear than having a good services and products will excelled the expectations of their consumers and build last relationships with them. Hence is a short description of consumers when buying food products online.

### **3.2.2 Consumers requirements when buying food products**

After have analyzed the reasons of consumers when using the different channels and especially the online channel. A short description of the requirements that consumers expect when buying food will be given. Requirements explained below apply for consumers that purchase food products from an online or an offline channel.

As it has been mentioned in the previous section, many consumers that buy products online lose the capacity to touch and see the product they are buying. World trends have made final consumers to be more concern with food **quality and safety standards** (Brosnan and Sun, 2004). Quality, safety and expiry date are requirements than many consumers expect when

buying food products, since these conditions will help them to determine if the products are worthy for been consumed and purchased (Sahin et al., 2007).

It is also a fact, that every time consumers plan to buy food products they are looking for quality products as well as products that have been properly handle during the different stages of the supply chain (Sahin et al., 2007), since this can assure to them that products still keep its main properties and shelf life (Van der Vorst et al., 2007). Therefore (Sahin et al., 2007) has propose that Supply chains should have intact cold chains all in order to preserve products quality and remain shelf life.

Again, when referring to the quality of food products, this can be related with products attributes like: freshness (Amorim et al., 2012), nutrition, appearance, texture, flavor, smell, shape, size, color and firmness (Brosnan and Sun, 2004). Furthermore, food safety guarantees that the consumption of such products will not affect consumers' health.

Another requirement that is becoming popular among consumers is related to “Environmentally friendly production” which takes into account products that have been produced in a sustainable way and the way that products have been manage until reach the final consumers (Bhaskaran et al., 2006, Van der Vorst et al., 2007, Ilbery and Maye, 2006, Akkerman et al., 2010)

Likewise, there are other requirements that consumers expect when buying food products. Those requirements are related with price, product variety, product availability, responses time and service (Chopra and Meindl, 2010).

In conclusion, consumers require many conditions when buying food products. Its expectation go from aspect related with products quality and safety which can force grocery retailers and independent businesses to consider certain conditions prior to obtain products from specific suppliers and find specific ways to preserve products quality when reached their warehouses and stores. Moreover, they should also consider requirements related with price, variety, availability, service and fast response time, since taking this in mind could allow them to reach competitiveness and loyal customers.

To accomplish customers' expectations when buying food is important business to have the proper conditions to preserve products quality and freshness and efficient SCM and order

fulfillment operations. Next logistics consideration when handling food products will be describe.

### **3.2.3 Food characteristics & logistic requirements**

After have analyzed the different distribution channels and customers' expectations when buying food products in the different channels, a description of food characteristics and logistic requirements to preserve its quality and properties will be cover.

Food products differ from the rest of FMCG by its characteristics of perishability and shelf life, many of them are consider as highly perishable consumers goods. Food products characterize by their perishability, shelf life, complexity and variety (Romsdal, 2014). Perishable products tend to deteriorate faster than the rest of products. Their deterioration process usually begins from the moment they are produced, when they are processed, it continuous during the distribution planning(Amorim et al., 2012) and it finish until it is consumed or disposed. Perishable products tend to create uncertainty for the end costumer with respect of quality, safety, reliability (Georgiadis et al., 2005) deterioration (Blackburn and Scudder, 2009, Ferguson and Koenigsberg, 2007) and its finite shelf life (Ferguson and Ketzenberg, 2005). For these special characteristics, perishable products required to be moved quickly to the market place in order to avoid its deterioration and the looseness of its different properties. In addition, food products require control and safety management systems and employees to follow procedures to handle the products, all these to preserve the product quality until it reach the final consumers (Luning et al., 2008, Luning and Marcelis, 2007).

An example of these kind of products could be: fruits, vegetables, bread, meet, fish, dairy products, sea-food products, prepared salads and other kinds. It is logical to assume that these types of products demand efficient and responsive supply chains in order to keep its quality and value (Blackburn and Scudder, 2009, Georgiadis et al., 2005, Ramirez Bathen, 2014).

According to (Georgiadis et al., 2005, Sahin et al., 2007)the management of perishable products required the need for frequent deliveries though special modes of transportation, for instance, refrigerated vans or transportations with cooling systems or cooling boxes. In the same way,(Georgiadis et al., 2005)suggest that food products also characterized by its seasonality and food safety conditions, which makes them required special storage facilities

to preserve its quality and freshness. If we consider these requirements from a retailer's perspective, these special conditions can be related with their fulfillment centers (warehouses) and its special cooling and humidity systems to preserve food products and avoid its deteriorations, suitable picking and package operations and trained employees to handle products properly. When referring to retailers and businesses that offer food products online these activities will need to be combined with an efficient delivery service and SCM.

In general it's possible to assume that during the distribution and storage stages across the supply chain, quality, freshness and safety conditions of the products will be altered (Sahin et al., 2007, Akkerman et al., 2010). In order to avoid products to deteriorate faster and lose its quality, there are essential considerations that SC collaborators need to take into account.

Table 3 shows a framework with logistic requirements that FSCs members should take into account when handling and distributing perishable food products that are sold through Internet or physical stores. This framework does not prescribe what FSC (SFSC) should or should not do, it presents a suggestion that SC collaborators should consider in order to keep food products attributes and guarantee quality and safety of food products to final consumers (Ramirez Bathen, 2014).

**Table 4: Logistic requirements that FSC members should consider when distributing food products adapted from (Ramirez Bathen, 2014)**

Logistic requirements	Function of requirement	How to accomplish the requirement
<b>Humidity &amp; Time-temperature</b>	Preserve product quality and physical attributes: freshness, color, firmness, shape, size.	<ul style="list-style-type: none"> <li>• RFID technologies: can help businesses to monitor temperature and time changes within different SC stages.</li> <li>• Establish systems to control these requirements. For example: cooling and humidity systems.</li> <li>• Keep warehouses and containers with temperature and humidity control. Adapt areas according to product characteristics.</li> <li>• Keep the constant monitoring and control of the temperature and humidity during the different SC stages.</li> </ul>
<b>Quality and Safety</b>	Both requirements guarantee product attributes, freshness and safety for the final consumers	<ul style="list-style-type: none"> <li>• Investment in safety management systems. For example, use and implement control systems to keep products safe.</li> <li>• Provide employees different trainings and procedures about the handling of food products.</li> <li>• Keep a constant monitoring and controls over employees, to ensure if they are following the appropriate procedures to handle food products.</li> </ul>
<b>Expiry date</b>	This allows the consumer check the life remaining for the food product that is purchasing and safety for the final consumers	<ul style="list-style-type: none"> <li>• Keep a label or a printed date for those food products that required the indication of its expiring date, this will ensure safety to the final consumer and the remaining life of the product purchase.</li> </ul>
<b>Packing</b>	Ensures food products to keep its attributes, quality and maintain the remaining shelf life estimated	<ul style="list-style-type: none"> <li>• Account with proper packing systems that guarantee that the products have been packed properly</li> <li>• Maintain the proper package procedures and materials to avoid food products lose its attributes and remain its shelf life.</li> <li>• Implementation of sustainable packages and smart packing technologies (RFID &amp; nanomaterials).</li> </ul>
<b>Tracking systems</b>	Allow the different SC members to know the current location of the food products	<ul style="list-style-type: none"> <li>• RFID technologies can allow the different SC members know the specific location of the food products.</li> </ul>
<b>Transportation</b>	Make products to preserve its conditions while been moved among collaborators	<ul style="list-style-type: none"> <li>• Vans, containers with cooling systems, insulation systems or cooling boxes to preserve products conditions.</li> </ul>



In order to keep products quality and properties is require than retailers and businesses take into account some of the factors mentioned in table above to preserve products characteristics. Additionally, it is important take into consideration the distribution channel that these companies are working with, since this will affect the way product will be handle until reach the end consumers. If we consider pure online retailers/businesses, these will require take into consideration a step further than traditional stores, since in many occasions this require to perform the delivery service to customer location and follow special customer requirements like delivery service in a specific day and products with specific requirements, for instance, green bananas instead of yellow ones. This kind of customized requirements will require additional carefulness when handling food product online. In such cases, retailers need to be careful in the deliver stage. A way to preserve such requirement is by keeping transportations with cooling systems and careful picking and packing operations.

### **Summary of the main findings of Chapter 3**

This chapter points out different consideration that business and retailers need to take into account when working with an online distribution channel and perishable food products.

- 
1. Business that operate an online channel need to identify the different advantages and disadvantages of this channel, and look how these will benefit their target customers.
- 
2. When business look to satisfy online consumers and specially those ones buying food products, they need to analyze how they are going to be able to perform this channel advantages and how they will make these customers choose them instead of businesses with a traditional or multichannel strategy. As has been mentioned before have a proper and clear competitive strategy will guide them to reach their aim in order to keep customer expectations and business goals.
- 
3. Businesses that offer perishable food products online require to keep in mind that when consumers buy these type of products, they are also looking for an entire service that offers them convenience and other benefits, besides, quality and fresh products.
- 
4. Companies not only need a competitive strategy but, also keep logistics requirements that food products require to preserve its conditions (Table 4), like warehouses (fulfillment centers) with the proper temperature and humidity conditions, as well as special modes of transportation.
- 

For these reasons and to achieve all this objectives business with an online channel required efficient SCM operations and OFO. Chapter 4 focuses in critical logistics operations inside an online channel.

## 4. Supply chain management

*This chapter will give a general overview of how the supply chain has been traditionally manage. Furthermore, a more detailed explanation of how the supply chain of an online channel is been managed and structured will be describe. Online channel is starting to be more common to be use by many retailers and independent businesses, thus, is important to understand how its supply chain is been configure in order to satisfy its customers and to perform efficient logistics operations. This chapter is use to answer RQ1 and RQ3 of this study. In addition, this chapter together with chapter 3 will be use to develop the theoretical framework for the case studies and for the following chapters.*

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### 4.1 Supply chain of an online channel

The goal of a SC is to integrate customers with suppliers, reduce members' response time, make product available whenever customers need and create the most value for the entire supply chain network and for their consumers. Generally a SC network, implicates the exchange of products/services, information and funds with the different members (collaborators)(Chopra and Meindl, 2010). Successful SCM also involves the coordination of activities within and between the different SC members (Croxtton et al., 2001)

According to Min and Zhou (2002) when structuring and designing a supply chain it is relevant to identify which are the partners that are critical for the value-adding activities of the business, and where the customers demand starts. The downstream the customer demand is, the more value-adding activities need to be performed, since usually this is the point where the consumers realize the final purchase. Holmström et al. (1999) have mentioned that “the value offering point” (point of consumption) presents a tradeoff between value creation and transaction cost. With this in mind is possible to think that those retailers and businesses that offer more value-adding activities and better services to the end consumers are the ones that have higher probability to win the last sale. Having all these elements into account, can allow business with an online channel to identify how its supply chain should be configure, find which suppliers and collaborators are critical for their business, identify key operations to

achieve competitiveness, and determine where the demand is located. However, having many value-adding activities can cause companies to have higher costs.

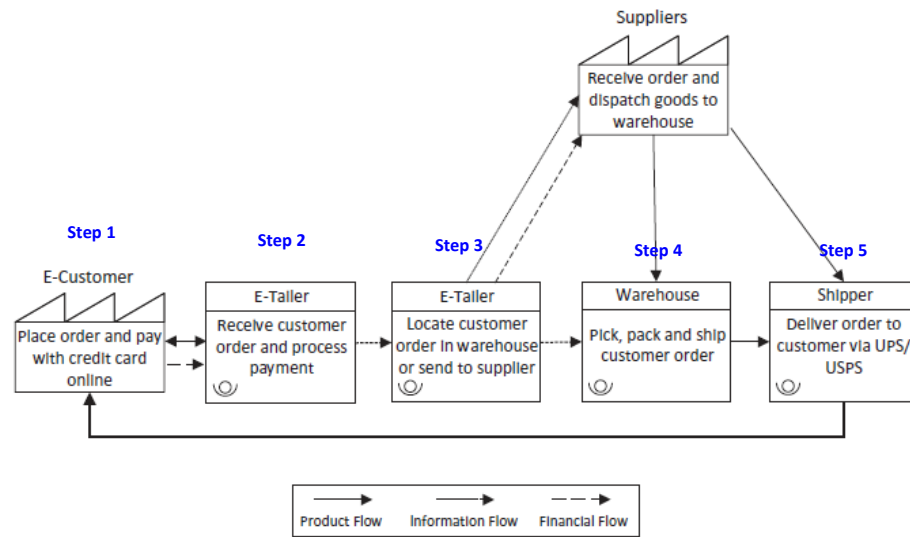
Operations in the supply chain of an online channel differs from a traditional SC in the operations related with: order fulfillment, cost structure, service quality, logistics requirements, customer segments, return policies, access to supply and demand, information sharing, and other processes (Johnson and Whang, 2002, De et al., 2013).

If we consider only pure online grocers, it is important to keep in mind that many of them have suffered bankruptcy when selling their products through Internet. However, there is an evidence that online grocery is alive and growing everyday (Boyer and Hult, 2006). For these reasons, having a proper supply chain configuration when managing perishable food products is critical for these firms to succeed. Hence, businesses managing an online channel need to identify which operations and processes are critical in its SC, especially when offering perishable food products to final consumers.

Supply chain distribution network configurations are critical for an online channel to work efficiently. Agatz et al. (2008) have mentioned that many of the existing traditional networks design models are been applicable for the online channel. This may explain why there is not possible to find specific distribution networks designs for the online channel. In the same way, (Agatz et al., 2008, Stritto and Schiraldi, 2013, Lim and Shiode, 2011) have highlighted that there is an area of research opportunity between online and physical distribution, since there is a lack of scientific research in this field.

Due to the lack of this scientific material, here is a general explanation of how the supply chain of an online channel usually works. Commonly, the online retailing process begins when customers place orders in a webpage (online site), when the customers have decided what they want, they need to know if products are available or not, and how long it will take the products to be in their location. If customers agree with this, they proceed to make the purchase, afterwards the “Final Seller” realizes the fulfillment of the order in its warehouse (picking and packing of the order), and lastly the order is delivery to customer’s location. Models below, present different perspectives of how this process can be manage.

The first model represent an “E-tailing SC process flow”. This model represents an online channel from an “E-tailers” perspective (Kumar et al., 2014). This model it is not specifically for businesses offering perishable food products online. However, it is possible to apply this model to business that offer this kind of products online, since the process of buying products online(e-fulfillment process) (Tarn et al., 2003) is very similar with many products, including food products. Figure no.6 present 5 steps in the customer order cycle.



**Figure 6: E-tailing supply chain process flow adapted from (Kumar et al., 2014)**

On the other hand, model 2 (Figure no.7), developed by (Xing et al., 2010) present the e-physical distribution and quality service from customers’ perspective. Here the fulfillment process of a pure online retailer also takes into account 5 major steps: placement of the order in the retailers’ website, confirmation of availability of the products, fulfillment of the order in warehouse (pick and pack of the order), delivery and reception or rejection of the order.

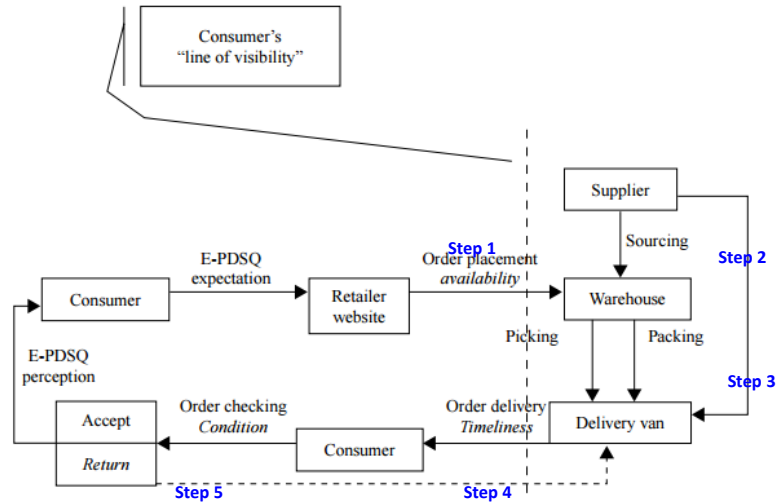


Figure 7: Consumers perspective of e-physical distribution service quality (Xing, Grant, McKinnon, & Fernie, 2010)

In these two models, fulfillment process happen from the retailers' warehouse (fulfillment center). After checking real companies' practices, it has been possible to find that many of the big grocery retailers fulfilled their orders from their own warehouse. Suppliers' fulfillment process happens just when the final sellers (independent business or retailers) need to fulfill their own warehouse inventories. Warehouse fulfillment strategy (dedicated fulfillment) applies more for those pure online retailers than for multichannel retailers. (Boyer and Hult (2006), Scott and Scott, 2008) have restated that a reduction of members in the supply chain can provide consumers more quality and fresher food products to the end consumers than online orders that are picked from a store. Commonly having more stages in the SC can reduce the shelf life and quality of the food products offered.

Additionally is important to restate that literature also distinguishes other 2 main types of fulfillment strategies when managing a multichannel strategy or an online channel: integrated and store fulfillment (Agatz et al., 2008, Kumar et al., 2014). When implementing the integrated fulfillment structure the stores an online orders are made from a warehouse/FC while in store fulfillment structures the online orders could be fulfilled from a preexisting store (Kumar et al., 2014, Lummus and Vokurka, 2002, Enders and Jelassi, 2009, Boyer and Hult, 2006, Boyer and Hult, 2005). Several authors have mention that the most common strategies used by big grocery retailers to fulfill their customer orders is by using a store

fulfillment (preexisting store) or through a warehouse (fulfillment center) (Enders and Jelassi, 2009, Murphy, 2003).

If comparing both models stated above with existing distribution networks it is possible to say that Figure 7, is similar to the distribution network presented by (Chopra and Meindl, 2010) call “Distribution storage with carriers delivery”. This model describes a distribution network where the retailer’s warehouse is replenished by several suppliers and after suppliers have fulfilled the warehouse a TPL takes the complete orders to the customers’ location. However Figure 8, suit more with the distribution network called “Distribution storage with last mile delivery”, here the product (final orders) are delivered to the customers’ location by the same retailer or distributor (Chopra and Meindl, 2010).

In the same way is important to restate, that the distribution network and SC of any independent business depends generally of the number of supplier that it has, customer location, number of warehouses and other elements. Figure no.6 and no.7 show a general description of how the distribution network and the SC (product and information flow are operated) of an online channel can be configured. In most cases, the SC design will need to consider aspects related with location of the inventory and fulfillment centers, access to supply and demand, distribution cost and customers service level.

When analyzing the location of the inventory Randall et al. (2006) have restated that E-tailers and independent businesses with only an online channel have the flexibility to put the inventory closer to customer orders. When the inventory is located near customer orders, this is usually closer to the delivery process as well. Making the CODP near the customers can cause businesses to require higher amounts of inventory, since it can be difficult for the businesses to reach a lower level of aggregation (Chopra, 2003). Locating CODP near the demand implies more facilities in order to be more responsive and to achieve a faster fulfillment processes. When locating inventories and warehouses near the demand and the delivery process, processing and inventory holding cost can result higher (Chopra, 2003) than when having the CODP farther from the customers. The closer CODPs are to the customer, the more efficient and responsive the businesses with an online channel can be. The farther from the customers the lower facility and holding cost the businesses can have. In the same way Chopra (2003) has restated that having facilities near customers is convenient for fast

mover articles than for slow movers products. With this in mind it is possible to think that when business manage perishable food products, it's better manage FC near the demand to avoid products to deteriorate faster and to provide fast delivery service.

Moreover, business operating an online channel and making the direct distribution or using a TPL tend to have more challenges in relation with the distribution network and the increasing volume of small-sized orders with frequent shipments (Anderson et al., 2003), since in many occasions small transactions produce significant transportation costs if they are not efficiently operated. To accomplish a successful delivery process, to customers distributed across a large geographic area, it is important to make a careful design and management of the physical distribution network including its terminals, distribution centers, and the network paths that connect them (Hyunwoo and Shiode, 2011). The same authors restate, that many of the delivery firms that carry e-retail shipments have established mega-scale hubs to process high volumes of flows with a high degree of spatial concentration, since maintaining cost efficiency and a high level of service in the distribution system is crucial for the business operating with an online channel (Anderson and Leinbach, 2007). An alternative that can help businesses to accomplish economies of scale could be the implementation of a "hub-and-spoke network", which can allow companies to create economies of scale while expanding to geographical coverage (Hyunwoo and Shiode, 2011, Agatz et al., 2008).

To summarize, it is important to restate, that the SC configuration and the distribution network of a business with an online channel, depends on the location of the fulfillment center/s and the location of the CODP. However, both of these elements will depend on the location of the demand and the size of the country where the business is operating. All these elements combined, will determine how the SC and the distribution network of a business/retailer should be configured. From a wider perspective, the distribution network should also consider the access to supply, especially from the key suppliers and if these are located close or far from the FC, since their location could affect the time to deliver the orders to the customers. Again, the time to fulfill an online order also depends on the availability of products in stock and the position of the CODP, location of the fulfillment center/s and other critical logistics operations. It is important to restate, than when managing an online channel

is possible that businesses required the support of TPL to deliver the products to consumers. If businesses have this other key partner, they must be able to develop strong relationships with this and manage efficient delivery services. The additional critical logistics operations, will be describe in the following section, since these can make e-tailers, regular retailers or independent businesses that offer perishable food products online to be more efficient, responsive, preserve the quality of its product and guarantee a high service level for their target customers. An example of these kind of players are AmazonFresh, FreshDirect, Ocado, DoortoDoorOrganics and Relay Foods. An example of these kind of businesses in Norway are Kolonial.no, Dagligvarer.no, and Retthjem.

## **4.2 Critical Logistics operations in an online channel**

As has been explained in the previous section, businesses offering products online required an adequate and planned SC configuration and distribution network. When referring to logistics management this is a process that pursues to optimize the flow of materials and information through collaborators and its different operations, in order to satisfy end customers (Waters and Rinsler, 2014). Section 4.2 presents some of the most critical logistics operations in an online channel. These section, together with theory presented before will be used to develop a guideline that can support businesses and retailers working with an online channel and perishable food products to reach efficient fulfillment operation.

Croxton et al. (2001) have recognized the importance of the integration of key business processes across the SC. When referring to “those key process and operations”, order fulfillment operations becomes critical in an online channel.

Order fulfillment refers to the process of managing customers’ orders through a “Final seller” (Chopra and Meindl, 2010), it begins with the placement of the order until this is deliver or available in a pick-up point for the customer. An efficient OFP should take into account customer satisfaction and service level (Thirumalai and Sinha, 2005). According to Ricker & Kalakota (1999) good fulfillment consists in taking the right product, putting it in the right box, shipping it, and gaining the customer’s approval. To make this entire process possible, this requires the ability to do operations efficiently and provide services that excel customer expectations. An example of a firm that has been able to manage efficient OFO is Chempoint,



which has been able to build a successful business model by adding value to their customers through products knowledge, efficient order fulfilment operations and responsive suppliers(Johnson and Whang, 2002).

Table 5 presents a list of scientific literature that restates the importance of order fulfillment operations inside an online channel, and the impact that all these operations have in order to keep customers satisfied and a high quality service. A good management of all these operations will make businesses working with an online channel to be successful in the market where they are performing.

**Table 5: Critical operations & elements in an online channel**

<b>Operations</b>	<b>Authors</b>
<b>Order fulfillment process/Order fulfillment operations</b>	(Xing et al., 2010, Croxton et al., 2001, Agatz et al., 2008, Johnson and Whang, 2002, Tarn et al., 2003, Scott and Scott, 2008, Waters and Rinsler, 2014, Wang et al., 2014, Boyer and Hult, 2006, Thirumalai and Sinha, 2005, Enders and Jelassi, 2009, Ricker and Kalakota, 1999, Xing and Grant, 2006)
<b>Warehouse operations/Fulfillment center operations</b>	(Agatz et al., 2008, Boyer and Hult, 2005, Boyer and Hult, 2006, Enders and Jelassi, 2009, Abrahamsson and Brege, 1995, Anckar et al., 2002, Tarn et al., 2003, Scott and Scott, 2008, De Koster et al., 2007, Xing et al., 2010)
<b>Last mile delivery strategy</b>	(Agatz et al., 2010, Banyte et al., 2011, Xing et al., 2010, Xing and Grant, 2006, Galante et al., 2013, Lee and Whang, 2001, Punakivi et al., 2001, Wang et al., 2014, Boyer and Hult, 2006, Boyer and Hult, 2005)
<b>Condition of order &amp; product deliver</b>	(Agatz et al., 2008, Xing and Grant, 2006, Xing et al., 2010, Tarn et al., 2003, Boyer and Hult, 2005, Boyer and Hult, 2006)
<b>Customer service/Service quality</b>	(Agatz et al., 2008, Johnson and Whang, 2002, Croxton et al., 2001, Aldin and Stahre, 2003, Xing et al., 2010, Lee and Lin, 2005, Boyer and Hult, 2005, Kumar et al., 2014)

As shown in table above order fulfillment is a critical process for those businesses offering products online from a FC. Operations related with warehouse operations, order condition, delivery service and service quality are continually highlighted by researchers when businesses are working with an online channel. Still, to make these operations to work properly it is require to have a proper SCM which means that business not only requires a good SC configuration and distribution network but also require to have a proper supply chain management to keep efficient purchasing process (replenishment) and an efficient information sharing. For these reasons, 4 order fulfillment operations have been classify as

critical inside an online channel, especially for those businesses and retailers that offer perishable food products from a FC.

Before starting with the order fulfillment process, “e-tailers” and business that offer product online require efficient methods that allow them use all their inventories and delivery capacity in order to have an acceptable profit. Therefore, before accepting an online order, business should be able to verify if orders are profitable enough for their business and reject those that are not cost-effective. A way to doing this, is by implementing systems and methods that allow businesses check if orders are within the target customers or inside the target location. Campbell and Savelsbergh (2005) have proposed a model for deciding whether to accept or reject an order delivery to customers’ location.

These section of the chapter will consider the framework developed by Agatz et al. (2008), and will describe 4 operations that have been found as the most critical inside the fulfillment process when operating an online channel. Combined these operations with a proper SCM, can help businesses working with an online channel to add value to its logistics operations, keep satisfied customer, high services and reach competitiveness in their target market.

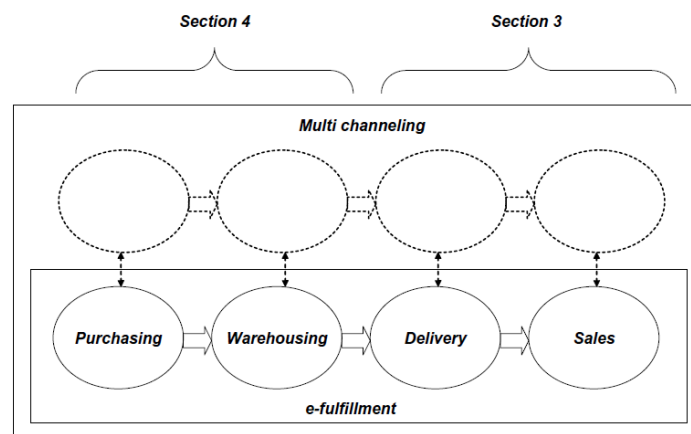


Figure 8: Structuring the multi-channel e-fulfillment distribution process(Agatz et al., 2008)

Following the 4 critical fulfillment operations will be address:

## **1. Supply management and purchasing process**

In this study, purchasing, will be consider the first stage of the order fulfillment process. This is highly related with the supply management, the supply process (replenishment process), inventory management and the location of the CODP described in section 4.1. Have a proper relationship with key suppliers and have efficient methods and systems to share information with supplier (Johnson and Whang, 2002, Singh and Power, 2009) are key aspects to keep a good purchasing process and to maintain the proper amount of inventories(stock) every time businesses received customer orders. When a company manage several suppliers, its important it to have into account that customer service level will be impacted by the suppliers' responsiveness, their ability to supply and their lead-time. Depending on how the company has agree its service level with customers, it will require to keep relationships with specific suppliers (key and supportive/back up) that can be able to supply products when needed and with appropriate lead times.

Furthermore, purchasing is related with the inventory management process and its objective should be to keep proper amounts of stock to fulfill the incoming orders (Agatz et al., 2008). For this reason, businesses require to plan a proper supply base on forecast and real demand(Vollmann et al., 2005) (medium or short term planning) and manage efficient replenishment cycles. Having all these elements into account will help businesses to avoid demand and supply uncertainty and will allow businesses working with an online channel to have appropriates stock and safety levels in their FC (warehouse/storage locations) to fulfill incoming orders. Especially if companies are managing perishable food products online, then these require a correct sales and operation planning with frequent deliveries and short lead times(Georgiadis et al., 2005) in order to preserve product freshness and quality.

An advantage of working with an Internet channel is that it can easily manipulate its demand by offering promotions or using strategies that can change its demand pattern. The implementation of any of these approaches will allow firms to arrange its replenishment and inventory policies as convenient as possible in order to supply their future demand.

Again when analyzing online businesses that offer perishable food products, they should consider to maintain their inventories close to the delivery process to avoid incurring in high

transporting costs, product deterioration and to reach a high service level for the direct customers.

## **2. Warehouse operations from a FC**

When business offers products online is important for them to have enough products stored when orders take place. Having the proper inventory level in their FC, warehouse operations and delivery service will influence customers' expectations.

Many online orders distinguished by having several products in one single order. This could be compare with a make to order strategy, were delivery dates depend of the downstream production capacity, and throughput time (Agatz et al., 2008).

From the perspective of an online business that offers perishable food products to final consumers, these type of orders required efficient warehouse operations (picking and packing of the products) and suitable delivery service to preserve products physical conditions. For these reasons, is important that business that work with an online channel commit to exact lead times (order placement and delivery). Since, the satisfaction of their customers will be related with these operations and the quality and availability of the product deliver.

In general, SC that handle perishable food products need to be flexible and responsive to avoid product deterioration (Georgiadis et al., 2005) with frequent product deliveries and responsive suppliers. When business have received these products from their suppliers, they need to have proper warehouse (fulfillment centers) with good humidity and temperature conditions to preserve products' quality and avoid its fast deterioration.

Regularly, warehouse operations are related with the storage, picking and packing operations. Especially, picking and packing operations are two activities that can affect online channel(Boyer and Hult, 2006) responsiveness, service level and order lead time, and as a consequence the entire SC performance.

Order picking is one of the most costly and labor intensive operations in a warehouse (De Koster et al., 2007, Tarn et al., 2003), it is consider a challenging task in an online channel environment. Usually, online order fulfillment process requires efficient picking and packing operations, since in many occasions orders are related with small transaction(Tarn et al., 2003, Agatz et al., 2008) that resemble a “make to order/ assemble to order” strategy(Agatz et al., 2008) which makes the picking and packing process more time consuming, than when

managing just single products. In addition, when products are delivered directly to final consumers the picking quality is highly important because this together with the entire online service will have an impact on customers' expectations. This suggests that depending on the type of products that companies are handling, these require specific picking and packing procedure to preserve its characteristics. Which can lead us to think, that fresh and perishable food product requires special procedures for employees to follow when doing the picking and packing, than when packing IT products, clothes and such other types of products.

Picking process consists in obtaining the right amount of articles to fulfill a set of customer orders, in addition it also covers the picking and packing of articles into individual customer orders (De Koster et al., 2007). In the same way these authors describe methods commonly use when picking orders in a warehouse: when orders are fairly big, each order can be picked individually (i.e. one order per picking tour), this way of picking is often referred as the single order picking policy (or discrete picking). On the other hand, the picker-to-parts systems, occurs when the picker walks or drives along the aisles to pick items, (De Koster, 2004). When orders are small, there is a potential for reducing times by picking a set of orders in a single picking tour. Moreover, by doing order batching process is possible to group a set of orders into a number of sub-sets, each of these can then be done by a single picking tour (De Koster et al., 2007). On the other hand, batching can increase the picking of the different articles but reduce the packing operations (Russell and Meller, 2003).

Further, picking quality can be supported by advanced picking technologies like RFT terminals, wireless speech technology and pick/put to light and pick to display systems (Tarn et al., 2003). Picking and packing methods also depends on the amount of sources that the company has, its competitive strategy, and the methods they have found to be more practical for the type of products they are managing.

In addition if a warehouse facility (FC) is organized by zones (Tarn et al., 2003, De Koster et al., 2007), or areas and accounts with specific routes for employees to follow when doing the collection of the different articles, all these activities combined can reduce operations times and make the picking and packing process more productive (De Koster et al., 2007). In the same way, Tarn et al. (2003) have restated the use of WMS, ERP systems to support

SC operations, and the use of conveyors belt for the packing operations since both tools can reduce operations times and improve its efficiency.

With the background given above, is possible to see that the organization of picking and packing operations have a big impact in warehouse logistics and thus the supply chain's and online channel operations(De Koster et al., 2007). Besides, is important to restate that businesses managing perishable food products online should also consider keep proper temperature and humidity systems in the FC to preserve products especial conditions.

### **3. Delivery service**

From an online business perspective, when orders have been completed then is possible for these businesses to start the distribution of the orders.

In the online business environment, the delivery service is part of the product offering and it is one of the main determinants of customer satisfaction(Agatz et al., 2008), since it comprise the entire delivery lead time (order placement + delivery). Besides in many occasions, the delivery service is the only opportunity that companies have to interact personally with its customers (Boyer and Hult, 2006).

Pure online retailers commonly use the “last mile delivery” to take their product to their consumers. This delivery strategy consist in taking the final product from their point of origin to the customers location (Waters and Rinsler, 2014, Chopra and Meindl, 2010, Stritto and Schiraldi, 2013, Xing et al., 2010). According to Nicholls and Watson (2005), the “ last mile” approach can help retailers and other businesses to reduce the total delivery cost, enhance profitability and develop a competitive advantage. On the other hand, other researchers have mentioned that this approach can be very costly for retailers, especially for those products with low margins (Enders and Jelassi, 2009, Tarn et al., 2003, Campbell and Savelsbergh, 2005, Müller-Lankenau et al., 2006). Therefore some authors have restated, that the distribution strategy that can help retailers to be more profitable is the pick-up/collection point strategy(Galante et al., 2013, Waters and Rinsler, 2014).

To accomplish an efficient delivery service, firms need to plan how and when to do the route to deliver the orders(Agatz et al., 2008), take into consideration customer location (location between costumers and FC) and transportation capacity; these elements combined will allow

businesses keep the time window promised(Xing et al., 2010) to their customers. In addition, to offer a better service, companies should agree the delivery time window with their customers (Agatz et al., 2008, Xing and Grant, 2006, Doherty et al., 2006), in the same way Agatz et al. (2008) have restated that pure online businesses should be able to establish order placements and delivery options concerning to customer's needs.

Du et al. (2005) demonstrate that business to consumers (B2C) environments required quick response and dynamic vehicle dispatching, than when serving to other companies or businesses. Lin and Mahmassani (2002) have also illustrated the trade-offs between delivery cost and customer service, and how tight delivery time windows affect delivery cost of an online grocer. With this is possible to assume that shorter delivery windows can generate a higher service level and increase customers satisfaction, on the other hand, these decisions can increase the delivery cost and decrease online channel profitability. The more flexible a service is the higher the costs can be if it is manage inefficiently. On the other hands, (Galván et al., 2005), conclude that online grocers should establish stores near their demand in orders to provide efficient delivery windows and delivery services. Hsu and Li (2006) have made a study were they show a delivery service strategy for Internet shopping, by considering demand-supply interactions and time dependent consumers, here these researchers propose a balance between delivery costs and customer service in terms of delivery lead times. With all these different studies, delivery service must be distinguishes as one of the key logistic operations in an online channel, since it has an effect in customers' satisfaction and in business efficiency and total costs and revenues. For these reasons, as long as a company is able to create a good route planning and have the proper distribution network (location from FC near customers ) then these elements will allow businesses to keep its delivery operations within the time promised and will allow these businesses to reach efficient delivery services, optimize costs and profitability and keep satisfied customers.

Again, for those online grocers, e-tailers, online retailers or businesses that deliver perishable food products to customers' home (location), handling of these type of products tend to require special modes of transportation (Georgiadis et al., 2005, Agatz et al., 2008, Enders and Jelassi, 2009) more extensive operation and cost-efficient processing of small transaction sizes. Moreover, food deliveries require efficient and fast deliveries in order to provide to

final customers a high service and quality products, and possible relatively short distances between the FC and demand. On the other hand, if customers require really fast and flexible options, then business should analyze the option of charge or give a “free” delivery services, as well as if this service should be develop by the own company or a TPL; and the impact that each of these decisions will have in the business and with their target customers.

#### 4. Service Quality

Thus, pure online players (Xing and Grant, 2006) or businesses working with an online channel, need to be careful with the different operations involve in their order fulfillment and distribution operations specially in relations to supply management, purchasing process, warehouse operations (picking and packing) and the delivery service(Boyer and Hult, 2006, Boyer and Hult, 2005). These operations combined with the product offered will have a big impact in the entire service quality, and with customer satisfaction. In the case of business that manage perishable food products online, these operations need to be really efficient and precise when handling these type of products, and should be seen as opportunities to gain customers loyalty and improve SC performance.

To conclude, four critical fulfillment operations have been found as critical when businesses or retailers work with an online channel and perishable food products. **Supply management, purchasing process and information sharing** are key elements to maintain enough inventories every time an online channel receives new orders. **Warehousing operations (specially the picking and packing operations)** are critical for the right fulfillment of the orders and for these to contain the right products, as well as to preserve products quality and physical conditions. In general, small order transactions implies higher picking and delivery cost (Chopra, 2003), therefore picking and packing processes need to be efficient when business are offering perishable food products online.

Moreover, an appropriate **delivery service** should include the distribution network, CODP location for the assortment and fulfillment of the orders, delivery strategy (last mile or pick-up point), time windows and lead times and the impact of all these elements to keep an appropriate delivery window length and customer satisfaction. Some researchers have address the delivery service operation through “last mile” and “pick-up” strategy and have



conclude that the best option is the hybrid structure since it reduce delivery costs (Rosenbloom, 2007) and supports and easy return option for the consumers.

All the operations stated above have an impact on the online environment and in the entire **service quality** particularly in challenging settings like the food market. These operations and processes are critical to improve SC performance of an online channel and to run successfully in the market, especially in the market related with perishable low margin goods.

## Summary of the main findings of Chapter 4

This section restates importance logistics operations when independent businesses and retailers decide to work with an online channel and perishable food products. As has been mention previously firms that handle perishable food products require efficient and responsive SC. Therefore here are the main outputs of this chapter:

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Business must identify logistics operations that impact the performance of an online channel and its entire supply chain. These two operations are:

**1. SCM (Supply chain management):**

Business that operate an online channel need to establish a proper SC configuration and distribution network. To make this possible companies need to take into consideration elements like: key partners and value-adding activities, size and location of the demand, access to supply and location of CODP and FC.

**2. OFO (order fulfillment operations):** this process is formed by 4 operations

- Supply management, purchasing process and information sharing.
  - Warehousing operations (specially the picking and packing operations).
  - Delivery service
  - Service quality
- 

To achieve efficient logistics operations inside an online channel businesses should focus in a proper management of SCM and OFO.

## 4.3 Conceptual framework

According to Magretta (2002), a strategy allows companies differentiate, or compete with, other players to achieve competitive advantage. To achieve this objective, businesses should have into account what their customers want and focus in those activities that add value to their operations. In other words, they should be able to offers innovative products/services, perform outstanding operations or do what they are doing better than their competitors, all in

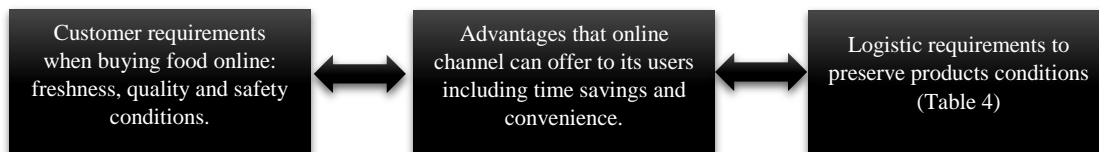
order to conserve their customers and keep growing in the market. In regards of businesses that work with an online channel and perishable food products, these need to focus on customer expectations, products logistic requirements and operations that have an impact on the online channel performance.

In order to achieve competitiveness and generate profit, it is important businesses to focus in its critical logistics operations (SCM and OFO). The purpose of focusing in these operations, customer needs when buying perishable food products online and logistics requirements to preserve perishable food products conditions is to create value (Magretta, 2002) and create distinctive competitive advantage (Sorescu et al., 2011). Teece (2010) has restated that business must be more than just a good logical way of doing business, they must focus to meet particular customer needs in order to reach profitability.

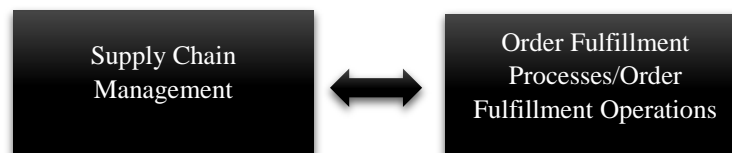
Through the different literature addresses in Chapter 3 and 4, it was possible to develop a conceptual framework based in an online channel that handles perishable food products and highlight considerations and operations that can support businesses with this channel to develop an outstanding performance.

Businesses offering perishable products online, should focus in the following elements:

***Considerations when offering perishable food products online (Chapter 3)***



***Key logistic operations in the online channel (Chapter 4)***



The previous literature study has brought to this thesis important information on the research area. It has been used to develop an interview guide to obtain relevant information from the case studies (Appendix A), and to explore information from specific areas that are relevant for this study. Study cases will be describe in the following chapter.

## 5. Empirical Cases

*This chapter constitutes the empirical part of this study; it answers research question 2 and complements information from RQ1 and RQ3, by providing a description of supply chain and logistic operations of two companies that work with an online channel and perishable food products. In order to start with this part of the thesis, general information about the companies and description of their logistic processes and operations are presented. Afterwards, this information will be used to develop Chapter 6 and 7 of this thesis.*

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As has been mentioned through Chapter 3 and 4, restated in their summaries and in the conceptual framework, different aspects and logistics operations are critical when working with an online channel and food products. Therefore two case studies will be described above and will address these different areas.

Information from this part of the study has been collected by conducting one semi-structured interview for each of the companies described. Information gathered in these interviews consists of data related with real practices that both independent businesses do when working with an online channel and perishable food products. In addition, the interview has been divided in activities and operations related with supply chain and logistic processes. In Appendix A it is possible to see the interview guide and how the different topics were addressed. Due to the scope of this study, this interview has been done mainly for “e-tailers”, retailers managing an online channel or independent businesses that offer food products online to final consumers (B2C).

Following, the description of Companies A and B and its supply chain and logistics practices will be explained.

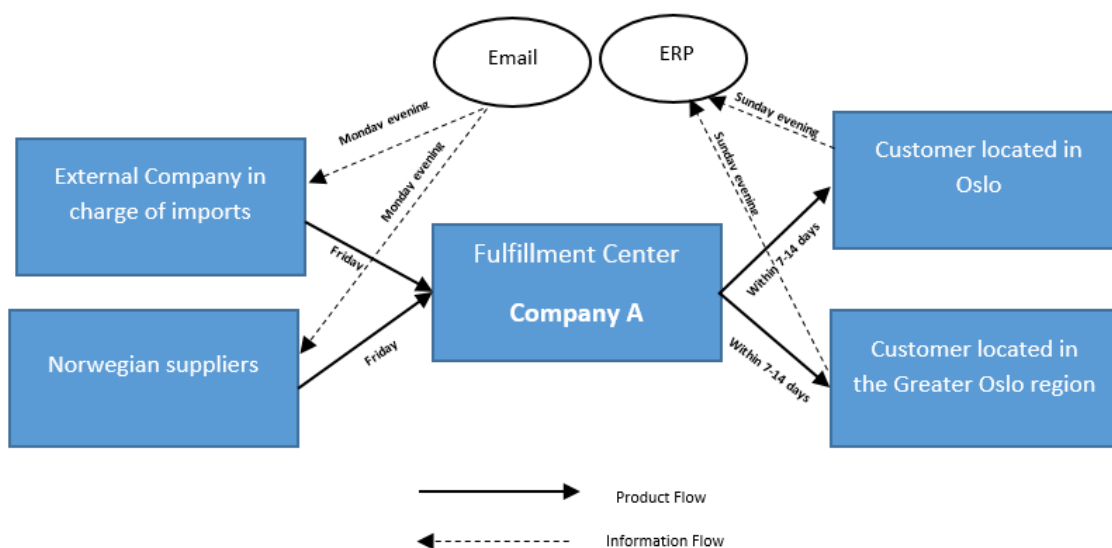
### 5.1 Company A

#### 5.1.1 General information about company A

This Norwegian company is an independent business that has customers in Oslo and in the greater region of Oslo. Currently this company has 4 restaurants. This company offers several organic products and “different baskets (bundles)” with different organic products online.

These baskets are fulfilled in its own Fulfillment center (warehouse). This company delivers its different baskets to final consumers' location (home). These products are delivered every 7 or 14 days, according to customers' preferences. This service works as a weekly or biweekly subscription, where the customers are able to cancel their orders any time prior to Sundays' evenings.

Company A started its operation in 2004, however until 2013 it started to offer these products online. Depending on the season of the year it is possible for company A to manage between 8-10 suppliers where many of them are local suppliers and the only products imported are those not produced in Norway. On the other hand, in winter season, the number of suppliers increases to 10-15 where some products are supplied by local farmers and other products are imported, for instance some fruits and vegetables, this to continue with the regular fulfillment of their different baskets. In its product assortment, Company A manages more than 8 baskets types and it is possible to find specific food baskets (bundles) that suggest customer to follow a recipe of how to use their products, or they can also order simple baskets with just vegetables or fruits. The range of products including in these baskets goes from dairy products, fruits, vegetables, bread, meat, chicken, fish and other perishable food products. Figure no.9 shows how Company A is managing and configuring its SC.



**Figure 9: Supply Chain Company A**

### 5.1.2 Supply Chain Management and Logistics operations

#### **Supply Chain Management & Purchasing process**

Depending on the season of the year its amount of suppliers varies, it can go from 8-10 or to 10-15. Local suppliers are spread all over Norway, the rest of its suppliers are in different parts of the world. For products that do not grow in Norway, Company A employs an external company that is in charge of importing the rest of the product. This company is responsible to manage all the operations related with the importation of products, until these reach Company's fulfillment center. This FC (warehouse) is located 30 km away from Oslo. Both local suppliers and the "International supplier" are required to deliver their products to the FC every Friday.

In order to be able to become a supplier from Company A, these are asked to meet specific requirements and have specific certifications. This is in order to preserve the quality of their products and guarantee the type of products they are offering to its customers.

Before accepting orders and starting with its fulfillment process and to see if orders are profitable (cost-effective) or not. Company A has a "postal number system" that allows them to verify if the new customers are inside the areas they cover. If customers are outside those areas, orders are rejected. If orders are rejected, these are saved by company A and if the number of orders increases in a specific area that it is not currently covering, then Company A makes an analysis to see if the new area will be profitable for them, if this is the case the delivery process starts in this new area and customers that were rejected before receive a notification that the area where they live will start to have the delivery service of their products.

On the other hand, orders that are accepted by Company A are managed in its ERP system. This also allows Company A to verify how many orders they have and calculate how many products they need to order to their suppliers. With this information in its ERP system, company A is able to calculate how many products they will require for the end of the week, since food baskets will be delivered to the customer the following Monday evening (7 or 14 days after receiving the order).

To maintain its FC with enough inventory and avoid stock-outs, Company A delivers weekly an excel spreadsheet via email to its suppliers. In these emails, they indicate the amount of products they will required on Friday. All suppliers receive this information on Monday evenings, this information is based on real orders received on the same Monday mornings. For this reason, the total amount of products from such orders need to be deliver to the FC on Friday. When receiving this information via email, all suppliers are responsible to deliver its products at the end of the week. This in order to allow Company A to fulfill all the orders receive the previous Monday morning. The replenishment cycle for all the suppliers its 5 days. Additionally, Company A manage a safety stock and plan in advance how many products they will require in week “X”, this to avoid stock outs. Normally, information flow and replenishment of products works well and Company A carries enough safety stock to fulfill all its orders. However, sometimes local supplier are not able to deliver its product as promised, when these problems happen and Company A does not find local suppliers able to supply its products including those “Back up supplier in Norway”, they have other “Back up suppliers” located in Sweden and Denmark. These are able to supply them every time local supplier are not able to deliver products to them, regularly the Swedish and Danish suppliers, replenish products during night so fulfillment operations from Company A are not delayed.

### **Fulfillment Center operations**

When fulfilling the food baskets Company A has a specific way to operate the processes inside their fulfillment center. In order to make their operations effective and keep the quality of its products, they follow a process call “due diligence” which consists in inspecting every single article deliver by its suppliers, this happens during the reception day (Friday), this operation its executed by a team of 8 members. When products are accepted, they are stored in their FC, when these do not meet its requirement they are send back to its suppliers.

Product that have been accepted, are stored in the FC with a general temperature of 8 degrees Celsius. In addition, this FC has special rooms (temperature zones) that have different degrees, depending on the product type. Dairy products (milk, cream) 4 degrees, herbs, tomatoes and salads 12 degrees, and freezers for products that require to be frozen for example meat, fish, chicken and such others.

Picking and packing operations starts on Thursdays and finished on Tuesdays, these operations are executed by 2 teams of 8 members each, these teams work in different shifts. First, products are picked from the different temperature rooms, to do this process employees have a trolley that they use to pick products from the different temperature rooms, when products from one type of basket are collected these are arranged in pallets for later been organized in the packing area, when doing the picking of products employees need to follow a specific route. Later, the packing area is organized with the products collected from a specific basket type. The packing area is organized by stations, stations are located next to each other, and they are located all over a conveyor belt. Each station has between 2-3 products, baskets must be fulfilled with the correct products and then when these are complete they are sealed and set aside in a specific area for this specific basket (bundle). In order to avoid boxes to be incomplete or with the incorrect products, Company A has a list on the wall that allows employees to know which products each baskets must contain. In the middle and at the end of the conveyor belt are settle control stations where one employee verifies if baskets have the correct articles. If one article is missing or incorrect, packing process is stop and the bundle must be fill with the missing article/s. During this process, employees should also check if products still in good conditions, each control station should check products physical conditions as well. If products are not good, they should be removed from the baskets and change for a good one. Another important fact about this process is that baskets are packed in batches according to the basket type, depending on how many different orders they have and how many different orders from specific baskets they have received. According to information gather Company A arrange its packing room according to the basket type, when doing the packing operations employees have a specific time to complete all the baskets, depending on the basket type. A clear example will be that 100 “Baskets A”, need to be completed in 300 minutes or 5 hours (this is just an example to understand the process it is not real data). In average, the packing process of one basket can last between 3-4 minutes, depending on how many products the basket contains. In average, a big basket can have 20 different types of products. When all baskets from one specific type are packed for instance “Basket A”, then they remove all products from the packing area, and change it with new products according to packing list for the next basket (bundle). It is important to restate that when packing the baskets, products must be collocated in a specific order in order

to avoid some of the products to damage. This means that heavy products should go at the bottom and fragile ones in the top, there is a specific procedure that employees have to follow when putting the products inside the basket. Products that are deteriorated in the FC or damage during the different operations are usually send to their supplier, for feed animals, if it is possible Company A will try to reuse these products for other products, if this is not possible then products become regular waste (% of waste vary every week).

### **Delivery service**

When baskets are completed, they are located in an area ready to be deliver. Delivery service starts 4 hours after all orders have been completed. Official delivery process starts at 17:00 and finish at 22:00, this service is done only on Mondays. Company A has found that this is the preferred day chosen by customers, this was the result of their marketing researches. Delivery service is performed by an outsource company which has agree with Company A follow specific guidelines when interacting directly with its customers. When products are deliver to long distances, cars have a cooling systems (cold cars).In short distances, vans have just special containers (boxes) for those products that require cool temperatures like fish, meat, dairy products, these to preserve it quality and shelf life.

In orders to verify that baskets have been deliver in the time promised, cars have a checking system that indicates the drivers delivery time. When products are delivery out of time or with incomplete products Company “A” manage compensation methods to avoid customer dissatisfaction.

### **Service Quality**

Until now company “A”, continuous growing successfully and it has a Quest-back system, that allow them know if customers feel satisfy with their different product ant its entire service. Customers present positive results and provide suggestions if they want. Currently Company A delivers its products just one day per week and do not delivers its products other days, it also does not offer fast delivery options it also offers a wide variety of organic products that delivers directly to customers’ location within Oslo area and its surroundings.



## 5.2 Company B:

Company B is a new small business that started its operations during August 2014, currently it is located in Frosta (Nord-Trøndelag), and it has around 150 costumers located in Stjørdal, Hommelvik, Malvik and Trondheim. It works with 15-20 suppliers from Frosta and it offers 3 different types of baskets (bundles) that contains fresh and local vegetables, local meat and bread from Frosta. Product range offer in the baskets varies according to the seasons of the year. All baskets are deliver to customers' location (home). Company B offers this service through subscriptions, were customers choose to receive their baskets every 7 or 14 days. However, customer are able to cancel its orders any time prior to Friday mornings. Figure no.10 depicts the current Supply Chain of Company B.

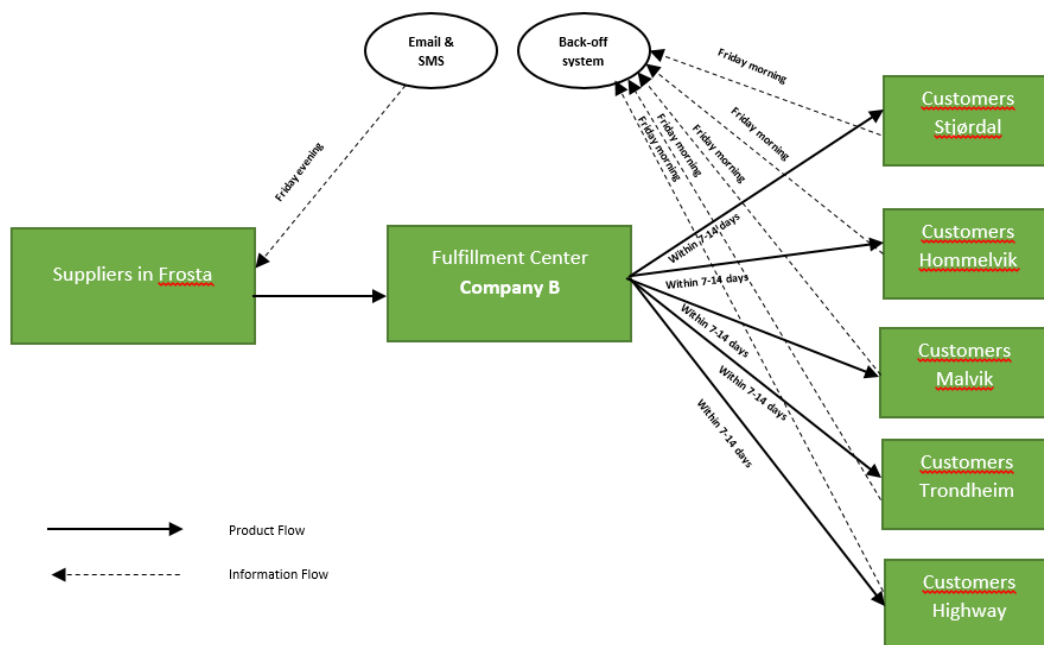


Figure 10: Supply Chain Company B

### 5.2.1 Supply Chain management and logistics operations

#### **Supply Chain Management & Purchasing process**

The amount of suppliers in Company B, varies according to vegetables from the season, it can vary from 15-20, all the suppliers are located in Frosta same as the Fulfillment center (warehouse). Frosta is located one hour away from Trondheim. Company B, receives all the orders and saves them in its back-office system. This back-office system allows Company B calculate the exact amount of products that they need for fulfilling their orders, it also organizes and saves the orders, and allows them to plan the route for delivering the orders, which need to be deliver the following 7 or 14 days.

After Company B has calculate how many products they need in its purchasing report, including its small safety stock. They send this information to its suppliers every Friday evening, all suppliers receive information via SMS, only one of the suppliers receives the information via email. Company B, picks up the products the next week on Monday morning and Tuesday, for being able to start with its picking and packing operations the following days. Suppliers' replenishment time takes between 2-3 days. Sometimes suppliers have not products ready when Company B goes to pick up its products. When these incidents happen, Company B make the collection 2-3 hours later, since the majority of its suppliers are able to make the supply, even though products have not been ready in the time promised. Company B is able to do this due to suppliers' proximity, since they are located no farther than 10 km from the FC. It is important to restate that since Company B is growing, sometimes they require to visit to its suppliers twice per day, when this is the occasion going back with the suppliers is not a problem. On the other hand, this is something that should not occur and it is rare suppliers to do it, however sometimes they forget to supply Company B. This happen mainly because it is a small company and all their suppliers, provide products to other bigger customers. To avoid this to happen, they are sending its information on Friday evening indicating that "X" amount of "Y" products should be supply next week (Monday or Tuesday). The purpose of sharing this information, is to avoid supplier to forget have products ready when they go to pick up products.

The supplier that takes the longest time to supplies its products when having not products ready is the "Meat supplier", this is the supplier that has the longest delivery period (48

hours), when being delay with Company B order. If they are delay then products are picked up until the next morning. To avoid this to happen, Company B has agreed with “Meat supplier” to have a safety stock to avoid stock outs.

It is important to restate, that stocks-outs are also related with the seasons, when products are no longer available from suppliers, Company B is responsible to remove these products from its shopping list, this in order to avoid customers to order these specific articles. Same happens with new products, when they are available they need to be included in the shopping list. Moreover, Company B has been able to fulfill all its new orders even though it starts its operations last August, this has been possible thanks to the long term forecasting and planning that Company B elaborated previously. However, now that the suppliers’ season is finishing they are limiting their number of new orders, mostly because they are almost using the maximum of their capacity. On the other hand, when season of products begins at the beginning of June and July, it will be possible for company B arrange new amounts of products with its suppliers. Still, its capacity is also limited in their number of cars and drivers, by the moment Company B only have 1 van and 2 drivers, this also has influence the limitation of accepting new orders.

In order to verify if customers are part of its target customers and areas they work with, Company B has checked manually if customers are within or not in the areas they operate. Nevertheless, at the end of May Company B will implement a postal number system that will allow them check if customers are within its focus area, this system will allow them save time and verify easier if customers are within or outside their target areas. On the other hand, if customers are outside areas they cover but located among or near the 4 cities where they deliver its products, they have found a way to serve to these customers, what they have done until now is arrange with the customer a pick-up point along the highway where customer can pick their baskets. This option allows Company B increase its number of customers (accept new orders) in a fast and convenient way.

It is important to restate that when Company B select its suppliers, they have base its selection in those suppliers that also provide products to the bigger wholesalers of Norway (BAMA and COOP).

When collecting product from its suppliers, Company B makes a fast check, but most likely the checking process is during the packing process. During the packing process and when filling the baskets they should check if products are ok or not. In addition, it is important to restate that Company B trust in its suppliers and believes that suppliers should also verify the products they are delivering before giving to them.

### **Fulfillment Center Operations**

Once products are already in its FC, they are storage in a room that keeps an average temperature of 5 degrees Celsius. Picking and packing operations are made during the morning of the same day that baskets will be deliver to customers, this means on the same Tuesday, Wednesday or Thursday morning. Company B possess both temperature and humidity systems. Products like meat require different temperature and are keep in cooling boxes. Picking and packing operations are doing manually by 2-3 people. Before starting with the packing process, products from the different orders are collected and organize in the packing area, the packing area is organized with the different products they will require to fulfilled all their orders (baskets). Organization of the packing process is by considering the 3 different types of baskets that company B offers.

After the packing area is ready, baskets are organized in a line from the last basket for instance No.50 until number No.1, then each basket is filled. They are fulfilled one by one according to its number, each basket has a checklist attached that indicates which products should contain. This checklist allows Company B have control of baskets and if they are complete or not. They call this process “ following the box” to do this process, company B organize the packing area with different vegetables in shelves of two levels so they can be pick up one by one to complete each basket. Shelves with different products are organized next to each other, the arrangement of products in a logical way starting with heavy products until the most delicate ones, meat products remain at the end of the line in special cooling boxes. The average time to pack a basket is 2.25 minutes, to keep this time employees must follow a route when fulfilling the baskets. Every time a product is collocated in the basket, a mark must put in the checklist. During the packing process, when products are collocated in the baskets they are checked by employees, to see if they are still in good conditions. One of their policies is arrange the box in a nice way, and put delicate products in the top and heavy

ones in the bottom. Company B has agreed a specific way to fix the products in a way they look nice and delicate for their customers.

Amount of waste varies during the year, in early season around 5% of their products become waste, at the end of the season this can be around 30%, depending of the types of products, some products have a shorter shelf life than others.

### **Delivery Service**

When packing process is finished and baskets are complete, delivery service can start. It is important to restate that baskets are deliver the same evening after finishing the packing process, approximately 4 hours after finishing with the packing process. Delivery service happen 3 days per week, Tuesday, Wednesday and Thursday. Customers receive their baskets the day that Company B delivers products to that specific area, orders are allocated by area. Delivery starts officially at 17:00-22:00, however it can begins earlier, depending on the location of some of their customers. Company B has chosen these days, because these are the most convenient days for them to do the delivery service.

To preserve the quality of its products Company B owns a van with a special insulation box (cooling box) that preserves a temperature of 5 degrees Celsius, this is use by company B to deliver the baskets to its customers.

### **Service Quality**

Until now, customers from Company B are satisfied with the days and time that company B use to deliver the baskets, as well with the products received. To improve its service they allow their customers to give them feedback via email, face to face or through its Facebook webpage. Customer can rate its service and products in Facebook web page. After summer of 2015, Company B plans to launch a survey to receive more suggestions and feedback in order to keep improving its services and find more how to satisfy its customers. When baskets come with an incorrect product, incomplete or a product in a bad condition, Company B offers to its customers different methods of compensation to keep its customer satisfied. Company B is aware than personal contact is very important therefore, they have chosen to deliver the products to their customers. Currently Company B does not have a special guideline that explain drivers how to interact with customers, however they are focus on

choosing drivers with a friendly and service attitude, this is because now Company B only has two drivers.

In the present, Company B is having a fast growth, therefore they have remain its old customers and still gaining new ones. Until the moment, they do not have other option days to deliver their products, but if demand increases, they probably will open more delivery days. In the present, they do not have a fast delivery option. Currently they offer fresh vegetables and raw products from Frosta, that are deliver directly to customer location to 4 different cities: Stjørdal, Hommelvik, Malvik and Trondheim.

## Summary of main findings of Chapter 5

- Both companies selected deliver perishable food products to customer location, both work with an online channel.
- Both companies manage the same kind of products (baskets containing food products). However, Company A is focus in organic products while Company B is mainly focus in local and fresh products.
- Company A operates in Oslo and the greater region of Oslo. While Company B operates in specific cities of Trøndelag.
- In general both companies manage a similar SC configuration.  
Suppliers → FC → Customers
- Both operate different ways to manage product flow. Company A receives products from suppliers, Company B picks up products from supplier.
- Both companies manage the same replenishment time with all their suppliers, both manage short replenishment times with its suppliers. Company A manage 5 days while Company B manage 2-3 days.
- Company A manage suppliers locally and outside Norway, while company B works just with local suppliers from one region.
- Both Companies manage different systems to manage its orders (ERP & Back up system), and to send information to suppliers: emails or SMS.
- FC operations present similarities and differences when fulfilling the baskets. Picking operations are similar, since both have chosen to collect products in batches and after

these are organized in a packing area. Company A organizes the packing operations by basket type, while Company B combines the 3 different types of products when doing the packing operations.

- Additionally both have developed their own methods to select suppliers, accept and reject orders, check the quality of their products, and manage waste.
- Besides both have agreed in organize baskets' products in specific ways, in order to preserved products physical conditions.
- Both manage methods to control that baskets are complete and that are not missing products.
- Company A outsource its delivery service, while company B owns its own transportation.
- Both companies manage special conditions in their FC, and transportations with temperature control.
- Both companies maintain methods to keep in contact with their customers and to know how satisfied they are with the products received and with the entire service.

## 6. Empirical Findings and analysis

*This part of the study will describe the findings of the case studies. It will outline information found about SCM and OFO as well as practices and conditions that these businesses use when handling perishable food products online. Additionally, the 3 main questions from this study, will be cover partially though this chapter. In this chapter, key findings are discussed; the last part of this chapter will restate the main findings. Findings from the theoretical part and the empirical part will contribute to the development of a guideline presented in chapter 7.*

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According to the conceptual framework created in section 4.3, and the empirical data found from both case companies, the findings of this cases will be address following.

### 6.1 Supply chain management (SMC)

It has been found that the SC and the distribution network of an online channel does not differ much from the “traditional” SC and the existing distribution networks. Designing of the supply chain refers to how the SC of a specific business is configure. In fact, the SC of an online channel is very similar to the conventional supply chains. One of the main differences among a “Traditional supply chain” and the supply chain of an online channel, is in relation with the last stage of the supply chain. Generally, in a “Traditional” supply chain customers make the final sale in an established physical store, if we look the SC of traditional businesses that offer perishable food products, typically the purchasing and picking processes of the products takes place in the store. On the other hand, the supply chains of an online channel receives orders from a “Electronic shop” and realizes the order fulfillment process from a FC or from a pre-established store for later make products available in a pick-up point or deliver the products to customers’ home. In the case of Company A and B, both manage the fulfillment from their orders in a FC (dedicated fulfillment) instead that from a pre-established store. By having a dedicated fulfillment center, both companies are reducing the “Traditional supply chain” and are being able to offer fresher products to its customers.



In the case of these two companies, food products go straight from suppliers to its FC for later been deliver to the end consumers. Additionally, both companies have established their FC near its demand, having FC near their demand has allowed them have more efficient order fulfillment processes, offer fresher products to their customer and efficient delivery service to consumers' location. Having products in a FC avoids products to be touch by several people before being purchase. According to theory and information obtained from both companies in the FC only specific employees, touch the food products instead of hundreds of consumers, which again allows online consumers receive fresher food products with longer shelf life and quality.

### **SC configuration and distribution network**

Structuring SC involves identify critical partners that realize value-adding activities, and identify where customers demand starts. In case of both companies, their demand starts in their “Electronic shop (webpage)”, when the customers place the order. Both required critical collaborators for the supply of different food products, as well as collaborators to execute the delivery process. In case of Company A, their main partners are their local suppliers and the external company in charge of making the imports, as well as the TPL that operates the delivery service. Company A has suppliers all over Norway and outside Norway. In its case, both imported and local products are deliver by the suppliers to Company's A FC, for later start with the order fulfillment operations. In case of Company B, its suppliers are very close to its FC, they are located in the same area where the FC its located, this proximity allows Company B to make the pick-up of their different products in their suppliers' warehouses. In case of Company B, this has decided to do the delivery service as well. As can be seen both manage a different suppliers location in case of company A supplies are located all over Norway and outside Norway on the other hand Company B only works with local suppliers near to its FC in Frosta. The delivery strategy will be presented more detailed in section 5.2.

Until now, both companies only manage one FC to fulfill all their orders, and this is mainly due to the locations of its target demand (customers). In case of Company A, customers are located in Oslo and the greater region of Oslo, in case of Company B customers are located in cities between Stjørdal and Trondheim. For both companies, it is important to remain near their customers, for this reason they have decided to establish its FC near its demand. If we

look this companies from a wider perspective, Company A is located near its demand but suppliers are situated in different places, which sometimes can affect suppliers responsiveness and delivery process, while company B has decided to be near its suppliers since its strategy is to manage fresh and local products. In case of Company B its challenges are more related with product variety than with suppliers' responsiveness, since its products range depends mostly of product of the season, whereas Company A offers the same product all the time therefore it needs to supply many of its products from non-local suppliers.

It is important to restate that as long as they pretend to keep its demand in a specific area then managing one FC will be enough. However, if they have in mind to cover new areas and cities, then it will be good for them to analyze the idea of expanding its distribution systems and number of FCs, since this changes can allow them be closer to its new demand, and reduce transportation cost. On the other hand, the investment of the construction of a new FC can be really costly in the beginning, but in a long-term this investment can be a good solution for potential demand and the companies' business goals.

Appropriate and planned supply chain design and configuration are critical for an online channel to work efficiently. When companies decide to configure, its supply chain is really important for them to analyze access to its supply, identify key collaborators, access to demand, FC and inventory location and products characteristics. In case of food products, perishability and shelf life have a big impact in products quality and therefore require more responsive and efficient SCM.

### **Information Flow**

Both companies A and B manage different systems to operate their supply information and customers' orders. For both orders from customers start in their webpages "Electronic shops". Orders are delivered to customers according to their subscription service, here customers specify how often they want to receive products (weekly or biweekly) and if they want to keep with the same products (basket) or change the order.

Company A has an ERP system that allows them monitor and check all their orders, and calculate the amount of products they need to order to its suppliers for the end of the week. Company B, has a back-office system that in the same way allows them to organize its orders

and calculate how many products they need for the following Monday and Tuesday. When sharing information with its suppliers both send the information in one specific day to all their suppliers. In case of Company A the information is send to suppliers on Mondays' evening for receive products on Fridays of the same week, this information is send through emails with excel spreadsheets. Company B sends a SMS every Fridays' evening to most of its suppliers indicating the specific amount of products that they will require for the following week (Monday morning and Tuesday). As can be seen, both companies have found efficient ways to communicate with their different supplier and share information in a fast way. In case of company A, it could be also a possibility for them to use their ERP system to share information with its suppliers, for instance they should check if its ERP has an interphase that allows them share information with its suppliers and exploit the benefits of an ERP system, this could make the sharing of information with its suppliers even more faster.

Furthermore, to have an efficient information sharing is important for both companies the possibility to establish long term partnerships with key suppliers in order to avoid companies have problems for receiving its products. Until now company A, has develop a system with "back-up" suppliers that are able to supply them every time key suppliers have an inconvenient or have problems delivering the products ordered. In case of Company B, it has start sharing information earlier with its suppliers and sending reminders for these to avoid to forget supply them with products. Moreover, companies working with an online channel require efficient information sharing and SC operations to keep a responsive an efficient service.

## **6.2 Order fulfillment operations (OFO)**

Both companies analyzed present different methods to manage its order fulfillment operations. Both companies studied manage its fulfillment operations from a fulfilment center (warehouse) rather than from a pre-established store. Both have found operations that suits better for their business strategy, and for the type of products they offer to its customers.

Order fulfillment management (OFO/OFP) refers to the process of managing customers' orders. For those business that work with an online channel the first stage of orders fulfillment starts when customers place their orders online and make the payment, after the

products are picked and packed in a FC(warehouse) or in a store, and lastly products are deliver to customer location or are picked-up by the customers in an specific point.

Based on information found in real case companies' 4 fulfillment operations have been identified as critical for those businesses that manage an online channel. Additionally, perishable food products are considered as the main products manage, since both companies considered work with this kind of products.

Before starting with its order fulfillment process both companies have found methods to verify if their new orders are inside the area they cover (target demand), and if they are profitable (cost-effective) for their business. Currently company A has a “postal number system” in their webpage that allows the new consumers see if the products can be deliver to their place, in case the “postal numbers” are outside the areas Company A work with, then orders are rejected and saved in the system. If the number of orders increase in an area, then Company A analysis if the “new” area will be profitable, if this is the case customers that were rejected before receive a notification that the area where they live will start having the delivery service. In case of Company B, when they received new orders the location of the orders has been checked manually, after location of customers has been checked customers receive and email indicating that the deliver cannot be possible, unless they will be interested to pick-up the product in a convenient place for Company B, if customers agree with this, then Company B meets customers in a place near the highway to deliver the basket and then proceeds with the regular route. At the end of May 2015 Company B will launch a “postal number system” that will allow them accept or reject the new orders easily, this system will allow customers see immediately if their orders can be accepted or not. Having this system, will allow company B accept or reject their new orders easily, however this new system will not allow Company B agree with the “potential” new customers to agree a picking point.

After orders have been accepted by both companies then their OFO can start.

### **Supply Management & Purchasing process (inventory management)**

The purpose of the purchasing process is to keep enough inventory every time new and regular orders are received. Purchasing must include correct sales and operations planning

and adequate replenishment cycles. Additionally, it requires efficient sharing of information, responsive and efficient suppliers.

These two companies present similarities and differences in the ways to manage its purchasing process. In case of Company A, the amount of suppliers varies according to the seasons of the year (8-10/10-15 suppliers). When products are not produced locally company A increases its import operations to bring products out of the seasons and those products that are not produce locally, this in order to keep offering their regular baskets (bundles). On the other hand, Company B works with products of the seasons, in its case the number of suppliers varies according to products availability (10-15 suppliers). If looking these companies in a wider perspective, both have adjusted its supply to its companies' "competitive strategy". Company A offers the same organic products all the year (fruits, vegetables, meat, dairy products etc.) therefore it needs to increase its imports to keep its product range, while company B offers just local products from the seasons.

To manage its replenishment process both companies send information to all their supplier once a week. Company A sends every Monday evening and excel spreadsheet in an email to all its supplier indicating the specific amount of products that they need at the end of the week (Friday). Here suppliers deliver the products directly to Companies' A FC. Its replenishment cycle is every week and it last 5 days (from Monday to Friday). In case of company B, this sends a SMS to almost all its suppliers every Friday evening, an only one of its suppliers receives an email. Its SMS indicate the specific amount of products that they need for picking-up the products the following Monday morning or Tuesday in the suppliers' warehouses. Here the replenishment cycle last between 3-4 days. As can be seen, both manage different replenishment cycles and frequent deliveries to fulfill its inventories as well as different systems to calculate its inventories and safety stock. Both manage short lead times when receiving perishable food products from its suppliers.

### **Warehouse operations (picking and packing)**

Picking and packing operations are critical operations from an online channel that handles perishable food products, this is mainly due to the nature of the products and the high labor costs related with warehouse operations.

Orders manage through an online channel that offers food products tend to be small orders with several low margin articles. Thus, picking and packing operations require to be really efficient in order to preserve products' quality and freshness, as well as to optimize FC (warehouse) performance and costs. Picking and packing operations of perishable food products also require employees to follow procedures and routes to pick and pack the orders faster and to be careful with the type of products they are handling.

After products have been received and accepted by Companies A and B. Product are stored in special rooms with specific temperatures to preserve products quality. Company A manage a storage room with a temperature of 8 degrees Celsius, in addition this room has different temperature rooms for the different types of products they have, while Company B has a big storage room with the same temperature (5 degrees Celsius) to preserve their different products. Additionally Company B has cooling boxes for products that require colder temperatures.

When doing the picking operations both companies have especial places where they allocate their products and specific areas for doing its packing operations. Company A, has products in different zones, so every time Company A plans to do the packing of a specific basket, what their employees do first is collect the products with a trolley and collocate them in pallets, they follow a route when picking the products and after finishing with their picking process they organize all the different pallets in the packing area. When they have finished a specific basket (bundle), then they again repeat the picking and packing process until finish with all their different baskets. In case of Company B, this has a storage room with all their products they also fallow a route when collecting the different articles from all their orders, after collecting the products from all their orders (this means products from the three different types of products baskets), then they arrange the products in shelves in order to have this prepared for the packing process.

When starting the packing process, both companies have different ways to make this process. Company A organize the packing process in stations, each station is next to each other and prepared with pallets with 2-3 different products, this stations are located all over the conveyor belt. In this conveyor belt baskets are collocated when they are filled with the different articles. In Company A, baskets are packed by product type, going from basket A

to basket H. To avoid baskets to be incomplete or with incorrect products, Company A has two control stations (one in the middle and one in the end of the conveyor belt) where 1 employee checks that the baskets have the right products, if one basket is incomplete the process is stopped and the basket is filled with the product missing. They also have a list in the wall that allows employees to know which products the baskets should have. The average time for packing one basket is between 3-4 minutes. In addition, when baskets are filled employees should collocate products inside the basket in a specific order, this to preserve the quality of all the products.

On the other hand, Company B, manages checklists that allows its employees to know and verify which products the baskets should contain. When doing the packing process they collocate the shelves of products in a specific area, next to each other, in a logical way (from heavy to delicate products). After having finished arranging the shelves in the packing area, employees from Company B started the process call “following the box” for doing this process efficiently employees should check the list attached to the box and pick the products indicated. When products are already picked and collocated in the basket, employees should put a check next to the product in the list. This list allows Company B verify and control if the baskets are completed or not. If lists have not a check then the product missed needs to be collocated in the basket. Besides when filling the basket company B has also established a guideline were they indicate to their employees how the baskets need to be organized, this to preserve products quality and for have a good presentation for its customers. The average time to complete a basket is 2.25 minutes.

Both companies manage different ways to handle deteriorate products (waste). In both companies waste varies according to the amount of orders. In case of Company A, when they damage the products in its FC, these waste is send to farmers that work with them so they can feed the animals, in case that waste can't be reuse then these becomes regular waste. Company B varies its amount of waste according to the season, the early the season of products the less waste they have the latest (nearest to the end of season) the more waste they have. As can be notice Company A, tries to reuse its waste while Company B manage deteriorate products as waste.

## **Delivery process**

In both companies, the entire order time last between 7 or 14 days according to customers' subscription choice. Until now, both companies manage a last mile strategy. Official delivery time for both companies is between 17:00 and 22:00 hours. Delivery service in Company A is on Mondays, since this has been the day choose as the prefer day for customers to receive the baskets, Company A found this information through a market research that they did to its customers. Whereas Company B delivers the products on Tuesdays, Wednesdays and Thursdays, these days have been choose by Company B, since the delivery service depends on customers' location.

Company A outsources the delivery service with a TPL, and has agreed with this TLP the way employees should behave when interacting with their customers. On the other hand, Company B has decided to realize this service to keep a personal contact with its customers. Since Company B has only two drivers, this has not yet a "formal" guideline for drivers to follow when interacting with customers. However, when selecting its drivers Company B looks for drivers with a service attitude.

When doing the delivery service, Company B, uses its back-office system to plan the route and delivery service from its orders, this system allows them to organize the orders and plan the delivery route from their FC to the different customers' location. Customers' orders are divided by areas and according to the area where customers live, then this receive the baskets in a specific day in the time promised. To keep an efficient dispatching process, Company B arrange its' route in a way to optimize the time, it organizes the orders (baskets) in a way to dispatches them as fast as possible, starting from the last order until the number 1. This process together with the way they have developed to organize the orders has allow company B to be efficient with its delivery and maintain the delivery service in the time promised.

In case of Company A, until now the way this company knows if products have been deliver to their customers in the time promised, is through the "checking systems" that the cars of the TLP have. These systems allow Company A verify how TLP is doing the delivery service. If products are deliver out of time Company A manage compensations to avoid unsatisfied customers.



Both companies manage transports with special temperature conditions to preserve the quality of the perishable food products. Company A manage special cooling vans for those customers that are located far from its FC, while orders that are close to the FC are deliver in regular vans and have special containers for those products that require colder temperatures. In case of company B, this company has its own van, this van has an insulation box that preserves a temperature of 5 degrees Celsius, this in order to preserve the quality of all the products inside the baskets.

### **Service Quality**

Companies A and B manage the same products “perishable food products” but these have distinctive characteristics. Company A offers a wide variety of organic products to its customers, whereas company B offers mainly local and fresh vegetables from the season and from Frosta area to its customers.

To guarantee the quality of its food products both companies work with suppliers with specific requirements. Company A just receives products with suppliers that have specific certifications that guarantee the origin of its products, whereas Company B, just buys products from those suppliers that also work with the biggest wholesalers in Norway. Both companies manage different methods for the selection of their suppliers. Until now, both procedures have been working well for both companies, since its current customers have showed satisfaction with the products they are receiving.

Besides, Company A has developed a process to check suppliers’ products, this “due diligence process” takes place every Friday, when products are received in the FC. In this process Company A has a team of 8 employees that make a deep inspection of every product received, and sends back to suppliers those products that do not meet its requirements. On the other hand, Company B, makes a fast inspection of their products when collected from suppliers’ warehouses, they trust in its supplier products and believes that it is also responsibility of its suppliers give products in good conditions. Both companies repeat the inspection of their products while doing the packing operations.

If analyzing just company B and considering that it has been operating since August 2014, it is understandable that its inspection process when receiving products from suppliers is not

that time consuming. For a new company it can be really costly and time consuming to check every single product manually. In occasions, it can be more cost-effective for a company to waste some products like food products that present low margins, rather than using productive labor hours in such activity, especially in countries with high wages like is the case of Norway. On the other hand, when company B expands its operations and number of consumers it could be a possibility for them to develop another processes that allows them to check product from its suppliers in a faster and efficient way.

To keep improving its service quality, both companies have developed methods to keep in touch with their customers and receive continuous feedback from them. Company A has developed a “Quest-back system” to know consumers perception about products and the entire service, as well as emails and phone calls for suggestions. Company B receives emails, phone calls and talks directly with consumers when delivering the baskets, it also has a rating system in its Facebook page to know if customers are satisfied with its products and services. Companies A and B had compensations for those customers that have received incomplete orders, this to avoid unsatisfied customers. In the present, both companies just deliver products in the offered days and have not alternative option, like fast delivery or delivery service in other days.

As can be seen, both companies are managing methods to keep a continuous improvement of customers entire service experience and products quality. Having these, “feedback methods” are necessary for both companies to keep growing and keep with loyal customers. Additionally, these ways of customers’ suggestions can be seeing for both companies as opportunities to improve its operations and service.

## **Summary of findings**

To summarize, Companies A and B present SC configurations that start with suppliers, that replenish products to their fulfillment centers for later realize the order fulfillment processes and the delivery service. Companies A and B have shown that their main partners are those ones that realize value-adding activities like the supply of their products. In case of Company A, the company that delivers the products to the final consumers is another main collaborator, while Company B has decided to make the last delivery to its customers. Company A receives

products in their own FC, whereas Company B picks-up their products in the suppliers' warehouses.

Additionally, key logistics operations inside an online channel are in relations to the order fulfillment process (OFP/OFO) and the operations inside of it: supply management together with purchasing process, warehouse (FC) operations, delivery service and service quality.

- Company A operates an ERP system to manage its orders and calculate how many products they need to order to its suppliers and sends emails and excel spreadsheets to communicate with them. Whereas Company B manage a back- office system to manage orders and calculate how many products they require to fulfilled their orders, and sends SMS to have an efficient communication with their suppliers. Both worked with suppliers that have been able to manage short delivery times.
- Both companies studied have fulfillment centers with special temperature and humidity conditions to preserve the quality and freshness of their products. In relation to, picking operations both companies follow, a batching order process method to pick and collect in groups the different products for their baskets. On the other hand, when doing the packing process, every basket is filled individually. In brief, both companies have found methods to make their picking and packing processes efficiently and have been following a make to order strategy, that allows them have several products in one single order. Both companies also have found methods to control and preserve the quality of the products they are offering to their customers while doing picking and packing operations and when transporting the products. In both companies when doing the fulfillment of the baskets they have systems and methods that allow them know if baskets are complete and if products are still in good conditions. Company A uses a list on the wall and control stations, whereas Company B uses checklists. Both follow guidelines to arrange products in a specific order to preserve its quality and to keep their presentation nice when delivering their baskets to customers. Both companies produce waste and have different methods to manage their waste.
- Both companies manage the last mile delivery strategy. Both companies manage a method to accept and reject orders. Company A outsource the delivery service with

another company while company B make their own delivery. Company A has delegate the personal contact to another company while company B, has a personal contact with its customers when delivering its products. Both deliver the products in the same time window but in different days. Company A has find that Monday as the preferred day by its consumers while Company B has arrange the delivery day according to customers location. Until now company B has develop a method to dispatch orders in an efficient way, plan the route and deliver the products in the time promised. Both companies operate vans with special temperature conditions to preserve the quality and freshness of the products, and manage compensations when orders have been deliver incomplete or in bad conditions.

- Both companies have different strategies. Company A operates in Oslo and its surroundings and offers a variety of organic products to its customers. On the other hand, Company B offers mainly local vegetables from Frosta to customers located between Stjørdal and Trondheim (Trøndelag).
- In order to improve its' service quality experience, both have developed methods to keep products quality and customers feedback. Having all these considerations have allowed both companies to keep with its current customers and find opportunities for improvements.

As has been seen, logistics related with SCM & OFO are critical drivers for an online channel success and a possibility for these businesses to develop a sustainable success in their marketplace and with their target customers.

## 7. Discussion of findings and solution

*Based on the findings and the analysis from chapter 6. Chapter 7 presents a discussion where the empirical findings are compared with scientific literature explained through chapter 3 and 4. Besides, section 7.2 of this chapter, will present a “Guideline” for businesses that are working with an online channel and perishable food products. This guideline pretends to support these type of businesses for improving its supply chain and fulfillment operations, as well as to help them to reach a high service level and effectiveness in the market where they are operating.*

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In this section, key points from the theoretical part will be restate in combination with findings from the two case companies. Literature study combined with findings from the empirical data will be use to establish the solution from this study.

### 7.1 Discussion

#### **Supply Chain Management & Order fulfillment Operations**

According to findings from Companies A and B, it was possible to find that the SC configurations and the distribution networks of these businesses do not differ much from the “traditional SC” and the existing distribution networks (Agatz et al., 2008). With the information described in section 4.1 it was possible to adapt both companies SC with distribution networks presented by (Chopra and Meindl, 2010, Chopra, 2003) were Company A resembles a distribution network similar to the one call the “Distribution storage with carrier delivery” and Company B resembles the one call “Distribution storage with last mile delivery”.

Again, as theory reveals the main purpose of supply chain management is the efficient exchange of information and product between collaborators(Chopra and Meindl, 2010, Min and Zhou, 2002), identify critical partners that realize value-adding activities, and identify where customers demand starts (Min and Zhou, 2002). Both companies have found that their demand starts in their webpages, when customers subscribe to their services. Both companies

have found that their main partners are their suppliers, furthermore Company A also has a TPL as its main partner, since this is the one that does the “last mile” service (Xing et al., 2010) for this company.

Regarding information flow related with orders management and purchasing processes, both have found efficient ways to gather information from their customers and share information with their main collaborators (Kumar et al., 2014, Johnson and Whang, 2002, Agatz et al., 2008). To begin with, both have a subscription service that works weekly or biweekly, where customers are able to place their orders and change them any time they want prior to Sundays’ evenings ( Company A) and Fridays’ evenings (Company B). This “subscription service” allows both companies have a proper planning and forecast for their replenishment processes (Vollmann et al., 2005), in the short and medium term. Moreover, Company A operates an ERP system (Tarn et al., 2003) to manage its orders and calculate how many products they need to order to its suppliers, besides this company sends emails and excel spreadsheets to communicate and share information with them. Whereas Company B manage an alternative IT system (Tarn et al., 2003) ( a customized back- office system) to manage orders and calculate how many products they require to fulfilled their orders, this company sends SMS to share information with their suppliers and phone calls to communicate with them.

Until now Company A, has developed a system with “back-up” suppliers that are able to supply them every time local suppliers have an inconvenient or have problems delivering the products. In case of Company B, it has started to share its information earlier with its suppliers and sending them reminders for these to keep and efficient supply of products. As theory highlights, having long-term partnerships and plans to mitigate uncertainties related with supply chain operations (Waters and Rinsler, 2014) when working with an online channel will be extremely important for these businesses to have in order to avoid future problems and unsatisfied demand.

In brief, working with an online channel implies more complex and dynamic SC, (Rosenbloom, 2007) and perishable food products require more efficient and responsive operations (Georgiadis et al., 2005). For these reasons, both companies analyzed manage the

fulfillment from their orders in a FC (dedicated fulfillment)(Boyer and Hult, 2006) instead that from a pre-established store (Boyer and Hult, 2006, Enders and Jelassi, 2009).

Besides, both companies have been able to reduce the “traditional supply chain” by been able to offer fresher products to their customers from their FCs (Boyer and Hult, 2006, Boyer and Hult, 2005, Scott and Scott, 2008). Working with a FC can guarantee customers that products are just touches by specific employees and are keep in special storage and temperature conditions(Ramirez Bathen, 2014, Georgiadis et al., 2005), rather than when products are exposed in a regular stores, where many consumers touch these products. However, is important to restate that when business work with an online channel and perishable food products these need to have careful picking processes in order to gain customer trust (Boyer and Hult, 2006). Additionally, both companies have established their FC near its demand(Hsu and Li, 2006), having FC near their demand has allowed both companies have more efficient order fulfillment processes and delivery processes(Randall et al., 2006). Company B has also remained near its supply, which has allowed them pick-up products in shorter lead times and manage fast delivery lead times to their customers(Hsu and Li, 2006). Both companies have been able to find responsive suppliers (Johnson and Whang, 2002), able to operate frequent deliveries and short replenishment cycles (Georgiadis et al., 2005, Kumar et al., 2014).

Still, before starting with its order fulfillment process both companies have found methods to verify if their new orders are inside the areas they cover (target customers), and if the orders are profitable (cost-effective) for their businesses. Currently Company A has a “postal number system” that allow customers know if they are inside or outside their cover areas, if they are outside then their orders are rejected. Whereas company B has done this process manually, and sends email to its customers indicating if the delivery process is possible or not. As theory, reveals sometimes is better for some businesses to reject some orders than accepting them, since taking these can be more costly for the business than rejecting them (Campbell and Savelsbergh, 2005).

Further, successful supply chain management also involves critical activities inside the supply chain (Croxtton et al., 2001), and improving value-adding activities to remain customers satisfied (Anckar et al., 2002). Therefore, these two companies have found

different methods and processes to accomplish their fulfillment operations(Agatz et al., 2008, Ricker and Kalakota, 1999).

When operating its warehouse (FC) both companies manage relatively small orders with several low margin articles(Agatz et al., 2008, Anderson et al., 2003) that resemble a make to order strategy(Agatz et al., 2008). Both companies manage storage places with special temperature conditions that make products to preserve its quality and freshness(Luning and Marcelis, 2007) . Picking and packing operations of perishable food products also require employees to follow procedures to preserve products conditions(Luning et al., 2008, Luning and Marcelis, 2007). For these reasons, both companies have also developed guidelines when picking up the products from the storage rooms and when packing them. In addition employees from both companies follow specific routes when collecting the products, since this can allow them save time and do their picking and packing operations more efficiently (De Koster et al., 2007). When doing their picking process both companies resemble an order batching process that allows them to group a set of products into a number of sub-groups, each of these sub-groups can then be done by a single picking tour (De Koster et al., 2007), on the other hand when packing each basket, each basket is filled individually, which resembles a single order picking (De Koster et al., 2007). In both companies when doing the fulfillment of the baskets they have systems and methods that allow them know if baskets are complete and if products are still in good conditions (Xing et al., 2010) Company A has control stations whereas Company B has checklists.

When orders are finalized, both companies proceed with the delivery of the baskets. As theory restates, delivery service is a determinant of customer satisfaction in an online channel(Agatz et al., 2008), as well as the only opportunity to have a contact with the customers (Enders and Jelassi, 2009). Both companies manage the last mile delivery strategy (Xing and Grant, 2006, Xing et al., 2010, Nicholls and Watson, 2005). Company A outsource the delivery service with another company (TPL) (Xing et al., 2010), while company B makes the own delivery service. This has allowed company B to have a personal contact with its customers when delivering its products (Boyer and Hult, 2006, Enders and Jelassi, 2009). Company A has found that Mondays as the preferred day for their consumers to receive the baskets. According to Xing et al. (2010) a good way to improve customer online service is



by agreeing delivery and day times with customers. Whereas Company B has arranged the delivery day according to customers' location. Both companies have been able to manage their orders in the time promised (Xing et al., 2010, Xing and Grant, 2006). Again, theory restates that B2C environments and especially online channels require quick response and efficient vehicle dispatching, in order to optimize the delivery service and costs (Du et al., 2005). Until now company B has developed systems to plan the route, dispatch its orders in an efficient way and deliver its products in the time promised. Both companies operate vans with special temperature conditions to preserve the quality and freshness of their products (Georgiadis et al., 2005, Sahin et al., 2007, Enders and Jelassi, 2009) while doing the delivery service. Furthermore, these also manage compensations when orders have been delivered incomplete or in bad conditions (Xing et al., 2010).

Lastly, literature has restated that one of the main elements to succeed in the market is by considering customers' needs and requirements instead of considering just business objectives (Banyte et al., 2011, Boyer and Hult, 2005). Therefore and in order to keep improving its service quality, both companies have developed methods like surveys, feedback through emails and phone calls, and personal contact with the customers to keep improving their entire service and products' quality. Having these instruments are also ways to keep in contact with customers and maintain a continuous feedback.

As can be seen, many of the current operations of both companies studied match, with information found in scientific literature. For these reasons, the solution of this study will be presented in the following section.

## **7.2 Guideline**

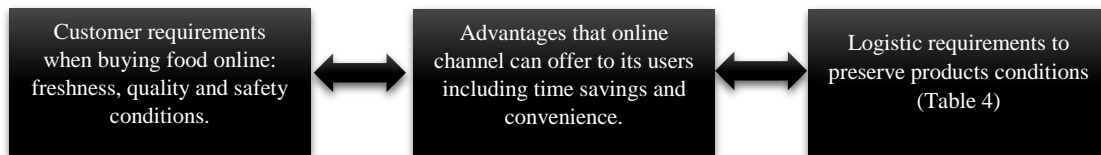
According to findings from previous chapters and the discussion made in the previous section, it has been possible to develop a guideline that integrates different requirements and logistics operations that businesses should consider when working with an online channel and perishable food products. In short, businesses can gain competitiveness in the market if they remain focused in keeping its customer requirements, maintaining products quality, carrying out

efficient value-adding activities related with supply chain management and order fulfillment operations and persist with the continuous improvement of all these elements.

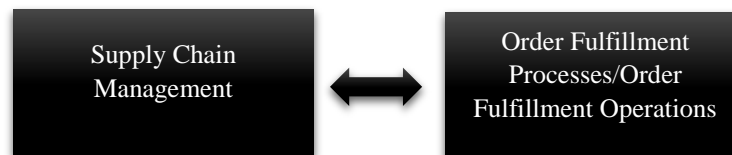
Supply chain and order fulfillment operations are critical for having efficient logistics, high service level and keep customer satisfy when offering products online. In addition, managing perishable food products makes the logistics of an online channel more complex and dynamic due to their perishability nature. Therefore, it is important that these businesses keep in mind that these products require especial storage and transportation conditions to remain its quality and freshness.

The following Guideline combines aspects and logistic operations that businesses working with an online channel should consider when working with perishable food products. The following framework has been developed in section 4.3, however, in this section a deeper explanation of this will be address together with practices that businesses can follow when working with food products in an online channel.

### *Considerations when offering perishable food products online*



### *Key logistic operations in the online channel*



**Figure 11: Logistics considerations for an online channel and food products**

### **Description of this “Guideline”**

In general, customers’ requirements, product characteristics and channel features are critical factors that influence the logistics of an online channel.

For these reasons, when businesses decide to work with an online channel and products with specific characteristics like the case of perishable food products, it is necessary that these businesses analyze the advantages and disadvantages that this channel has in relation with the types of products it is offering, and how its advantages can benefit their target consumers. Once businesses have identified its target customers requirements and product logistic requirements, then it is easier for them to align its “competitive strategy” with its logistics operations, since all these elements combined will allow businesses reach a high service level and become successful in their marketplace.

As has been mentioned previously, one of the advantages that online channel can offers to its customers is the time savings and convenience. In case of those customers that are interested in buying perishable food products online they also require these businesses to offer them fresh and quality food products in a relatively short and acceptable time.

When referring to the **Supply Chain Management (SCM)** approach, here businesses should consider aspect like supply chain configuration and distribution network, access to supply and demand, inventory and fulfillment center(warehouse) location, identification of critical partners, ways and systems for sharing information efficiently, all these factors combined will allow businesses to have responsive and efficient supply chains. Developing efficient SC configurations that considers customers and supply location, FC and inventory placement and long-term partnerships with key and responsive suppliers will allow businesses that work with an online channel to have efficient lead times.

Besides, businesses offering perishable food products should consider to have responsive suppliers that are able to respond to changes in demand and deliver products in a fast way, this in order to have quality and fresher products at all times. Long-term partnerships with key suppliers, sharing accurate information and efficient forecast and demand planning are critical to make suppliers perform efficiently. Furthermore, another aspect that could improve businesses service level, is to allow suppliers check how the inventories of the products are behaving (visibility of the inventory), since this could allow businesses with an online channel to have efficient replenishment process. This could be made by having an ERP system or other systems that allow suppliers to observe how the inventories are behaving. To sum up, all these aspects can allow businesses reduce lead times, eliminate unnecessary inventories, avoid stock outs, have fresher products and keep with loyal customers.

On the other hand, the **Order fulfillment operations** look more in detail the logistics operations related with the fulfillment of the orders. In case of those businesses that offer perishable food products online, in many of the cases their orders tend to be relatively small and resemble an assemble-to-order strategy, this means that the orders tend to have several small articles that are included in one single order. In order to preserve products characteristics, employees should follow guidelines and pre-established ways to collocate the products inside their bundles (packages), to avoid these to deteriorate or lose its physical conditions.

If referring to the **Purchasing process**, this has as an objective to have the correct levels of inventory when receiving customers' orders and avoid stock outs. Therefore, using proper order management systems like the "subscription option in an electronic shop" together with ERP systems, or other customized IT systems can allow these businesses to calculate the exact amounts of products that they need to replenish from their suppliers, this in order to have proper amounts of inventories at all times. Additionally, businesses need to find ways to keep frequent information sharing with their suppliers through an ERP system, IT systems, emails, SMS, chats or by phone.

Efficient warehouse operations, refers to keep appropriate storage conditions to preserve products physical attributes. Conditions like temperature and humidity control are necessary elements for a FC to have in order to keep perishable food products quality and freshness. Moreover, **picking and packing operation** need also to be carefully and efficiently done in order to preserve products quality and FC productiveness. In regards of picking processes, these can be organized in batching processes since different products can be collected into a number of sub-groups, for later be organized in stations or shelves in the packing area. Having adequate picking operations and routes will help business with an online channel and food products to make the collection of different products faster than when picking one group of specific products, for instance picking, tomatoes, lettuce and onions together rather than just tomatoes or just onions. In case of the packing operation, this can be a flexible packing line, in the sense that the organization of the packing process can be arranged in stations or shelves next to each other that allow employees pick up products in an easy and ergonomic way and avoid waste of time. The organization of shelves and stations should also consider a logic way to put the products from heavy ones to delicate ones.

In relation with products packing order, these could be arranged by product type for instance basket A, then B and so on (resembling a packing process by batches), or by individual basket types. The strategy to filling the different orders needs to be related with companies' capabilities, resources and competitive strategy, since every business works differently, therefore, they need to find out which operations suit better with their business goals and the types of products they are handling. Additionally to preserve products quality, businesses should invest in training their employees for the picking and packing processes of food products and give them procedure to handle products properly to avoid their deterioration inside the FC and when packing customers' orders. In order to provide complete orders to the customers, they also should manage methods to control and verify that orders are complete and that products are in good conditions. For instance checklist to verify if the order are correct and complete. If operations inside the FC are done correctly this can help business to reduce its amount of waste and optimize the use of their inventories.

After finishing with FC operations the ***delivery service*** should proceed, this is an extremely important operation when working with an online channel and with the last mile strategy. Delivery service is a determinant of service quality in an online channel and a critical driver to keep customers satisfied. For this operation to work efficiently, is critical to analyze the location between the FC and customers, since this condition is crucial to keep the time promised and products in good conditions, especially when working with perishable food products. For these reasons, have appropriate temperature conditions in the transportation is necessary to preserve the freshness of some products and more likely if customer are located far from the FC, as well as efficient dispatching methods and routes, to deliver product in the time promised and to optimize the delivery costs from the businesses. Another way to create value-adding activities when doing the delivery service is by giving employees special guidelines on how to interact with customers since this can create a close interaction with them and a sense of identification with the company.

Finally, ***service quality***, this operation is related with the perception of customers with the entire online experience and products received. To keep a close interaction with customers is important for businesses to develop ways to stay in touch with them and find methods to receive constant feedback to improve its operations and customers experience. Receive

customers' feedback by email, phone calls, survey or any other media can signify opportunities to improve companies operations and keep a leading position in the market.

Have this guideline when working with perishable food products online, can support businesses to keep a continuous improvement in their supply chain management and order fulfillment operations and help them to achieve a competitive advantage in the marketplace where they are operating.

As theory restates and what world trends show, the selling of food online is a reality, therefore this guideline, can support businesses to keep in mind considerations to improve their supply chain and order fulfillment operations when offering perishable food online and help them to differentiate from their competitors. Moreover, this guideline look to support businesses to develop a good strategy in relation with its logistics and assist them to keep a sustainable success with their current and new customers in the market/s where they are operating.

### **Limitations**

This solution has been based on business that offer baskets (bundles) with perishable food products online that are deliver to customers' home (location). The importance of developing these "framework and guideline" is that these can assist to those businesses offering perishable food products online to stay competitive in the market where they are established and with the customers they are serving. This guideline has been developed thinking in firms that work with high perishable food products rather than with other types of food products.

Additionally, to make this guideline work properly and reach its final objectives, it requires companies to analyze its current logistics and the different aspects mentioned on it, and analyze gaps between what they already have accomplished and what it is missing. As well as, a person or team responsible for considering all these logistics aspects, how these can be achieved and implemented, and the trade-offs between all the elements, since implementing all these aspects will possible require economic investments, and an adaptation period to make all the different aspects to integrate and work properly.

Is important to mention that this guideline also presents limitations for its application. Beginning by saying that a deep analysis of the possible economic investments and time of adaptation has not been made, this means that it is not possible to give specific times and

costs to adapt and integrate all these practices. In addition, its limitation can be in relation with companies' competitive strategy, business goals, capabilities, economic resources and time operating in the market. Since having very efficient supply chains and logistic operations in many of the cases implies investments in regards of systems for sharing information, supply chain configuration and distribution network, transportation, information technologies and trained working force.

The limitations of this model can also be in regards of the type of businesses that were interviewed and the type of products analyzed, considering that other types of firms and products can require more flexible supply chains and customers open to wait longer time etc. Both companies analyzed work with perishable food products like raw vegetables, fruits, dairy product and meats that are deliver in baskets to end consumers. For this reason, this solution can require different logistics when working with products with longer shelf life or other types of products.

Another constraint is in relation with the market analyzed, since Norway presents characteristics like long extension, low-density population and a population with high-income levels. Considering more populated countries or with small extension territory can require the use of other types of logistics and supply chain configurations, as well as availability of products, access to technology, politic and economic systems, income level, preferences and knowledge for an online channel etc.

### **Suggestions for further research**

This study could be used for capturing many of the strategic logistics operations of businesses and retailers that are offering perishable food products online, for a country with a low-density population and long extension territory, as well as for different customer segments.

This study can motivate future research in regards of other SC configurations that manage perishable food products online and works with a pick-up point strategy. As well as, conduct a study based in similar businesses that operate in a big extension or with a high-density population.

Beside, another opportunity could be by focusing in businesses that work with an online channel and a “hub-and-spoke network”, and how this “distribution network” can allow companies to reach economies of scale while expanding to geographical coverage.

Further research could be made by analyzing the potential benefits or disadvantages of implementing a multichannel strategy and the management of pick-up points together with the “last mile strategy”.

Additional investigation can be in relation to, establishing long-term relationships in business that work with an online channel and analyze how to determine which partners are critical, when to outsource operations and the impact of such decisions with the target customers.

Studies related with customers’ expectations by focusing in elements like the entire online service and the possibility to offer customize products online (make/assembly to order) taking into consideration perishable food products versus prepared meals can be an interested topic of research. As well as the differences between the order fulfillment operations.

In regards to warehouse operations offering perishable food products online, studies can be made by considering the implementation of the “7 waste of lean” or “5S lean methodology”. These practices can help “picking and packing operations” to reduce unnecessary activities in warehouse and optimize its productivity, since reduction of times spent on non-value-adding activities can support firms to focus its resources in key operations.

Similarly, new research can be related with the development of plans that allow businesses reduce uncertainties and reduce risks related with order fulfillment and SC operations.



## 8. Conclusions

*This chapter encloses the conclusions of this study. It summarizes the findings and contributions of this thesis and the degree to which the study has answered research questions and objectives. Additionally, suggestions for further research are presented here.*

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This study highlights the importance of logistics when businesses work with an online channel and perishable food products. An online channel not only provides physical products to its consumers but also related services with products' quality. Having a defined competitive strategy and knowing what customers want are extremely important elements to succeed in the market and with products sell online. However, when business decide to work with this channel these are not the only aspect that businesses should take into account, further, they should also manage efficient supply chain operations, fulfillment operations and distribution processes. This thesis investigates the importance of logistics in an online channel that offers perishable food products to final consumers.

The 3 study objectives and research questions of this study were achieved through a literature study and two case studies. It was possible to see that current literature does not present enough support for those independent business that operate with an online channel. Most of the information found was in relation to “e-tailers”, online retailers or traditional retailers that operate with an online channel. At the beginning of the study 4 potential companies were identify as potential collaborators. However, just two of them contributed with this study.

Following the results of this thesis are presented. SC configurations and distribution networks of an online channel do not differ much from the configurations of traditional SC, the main differences are related with the approaches to make products available for the end consumers (final customers), since in most of the cases product are deliver directly to the end consumers or are available from a pick-up point rather than from an established store. If considering literature and companies analyzed the first one remains a distribution network similar to the one call the “distribution storage with carrier delivery” and the second company remains a “distribution storage with last mile delivery” both of these structures are already used by traditional businesses and retailers. Both business coincide in using a FC (warehouse) to realize their fulfillment operations and the last mile strategy for delivering their products.

In addition it was possible to find out that an online channel with food products requires efficient supply chain management and order fulfillment operations (supply management, purchasing processes, warehouse operations, delivery service and service quality) since these aspects are determinants to provide a high service to the consumers and to remain competitive in the market. Moreover, find an alignment between the competitive strategy, customer needs, products requirements, combined with adequate supply chains and order fulfillment operations can help these type of business to remain successful in their markets for a long period.

The “guideline” presented in section 7.2 supports business offering perishable food products online with critical logistics operations, and highlights how these aspects can enhance the online channel performance, for remaining a high service level. On the other hand, make the application of this solution possible will require businesses to have sufficient resources and time to achieve these goals. Furthermore, this guideline can be analyze from a wider perspective considering that nowadays markets are becoming more open thus, businesses need to manage efficient logistic operations and consider customers’ needs since these factors are key for their continuous growth in the local market and abroad.

Knowledge acquired in this study was in relation of businesses that operate in Norway and that are offering basket with perishable food products, and learning how this businesses are currently managing its SC configurations and order fulfillment operations. As well as information related with an online channel, food logistics requirements and the importance of considering customer requirements in order to make this channel to succeed. Along with warehouse conditions, operations and especial transportation to preserve these products.

It has been notice that further research can be by applying the suggested solution. Implementing a pick-up strategy when working with an online channel and the last mile strategy and the benefits and disadvantages of offering both strategies. Hub-and-spoke network when working with an online channel and perishable food products, implementation of “7 waste lean principles” and “5S lean methodology” in a fulfillment centers that handles perishable food products that resemble an assembly to order strategy. Further, studies in relation with the development of plans that allow businesses reduce uncertainties and reduce risks in logistics and SC when offering products online to end consumers.

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## APPENDIX A: Interview records information

### Company A

<b>Interview Participant</b>	<b>Role and position in the Company</b>	<b>Interview date and time</b>
<b>Participant 1</b>	General Manager	05.05.2015, 14:00-15:00

### Company B

<b>Interview Participant</b>	<b>Role and position in the Company</b>	<b>Interview date and time</b>
<b>Participant 1</b>	General Manager	07.05.2015, 16:30-18:30

## **APPENDIX B: Interview Guide for Companies**

### ***Introduction***

- 1.1. Explain the scope of the study and the objectives of the interview.
  - 1.2. Explain the purpose of recording the interview and ask the participant if it is okay the interview to be recorded. Clarify that the recording will be just for personal use and to remain the validity of the data collected.
  - 1.3. The interview will remain anonymous and information collected will be used to complement the study.
  - 1.5. Clarify technical definitions that will appear during the interview. These definitions will be used to describe the fulfillment processes from the company.
- Concepts that will be use for the interview: distribution network, inventory management, supply and demand and terms related with fulfilment processes and operations.

### **SUPPLY CHAIN ORGANIZATION**

1. How many suppliers you have to replenish your different products?
2. Do you fulfill your customer orders from a suppliers' warehouse or from your own fulfillment center?
3. How many fulfillment center you have?
4. Are your fulfillment center physically close to your customers (demand)?
5. Are you suppliers physically close to your fulfillment centers?
6. Do you have any special system that allows you to verify if the orders will be profitable for the company? Sometimes it could be more expensive for the company to accept some orders than reject them.
7. How does your supply chain is organized (structured)?
8. How long does your company takes to complete the whole order: from the customers purchasing process until its delivery to them? Provide estimate time in hours or days.

### **INFORMATION FLOW**

1. How do you manage your orders by email, ERP system, an online system?
2. Do you use any system to share information with your suppliers?

3. How often do you share information with your suppliers?

## **FULFILMENT CENTER OPERATIONS**

### **Product requirements**

1. Do you manage suppliers with safety and quality food certifications?
2. Do you have any procedure to verify the received product from your suppliers? For example: checklist or system to control if the products delivered are in good condition (valid expiry date or standards to accept or reject the product received).
3. Do you have systems in your fulfillment centers to preserve the quality of your products? For example: cooling systems, systems to control the humidity and temperature inside the fulfillment centers.

### **Inventory Management**

1. How long does it take for your suppliers to replenish your orders (inventories)?  
Give an average time. For example: daily, every 3 days, weekly.
2. Do you manage different replenishment frequencies for your different suppliers?
3. How does the time that your suppliers use to replenish your orders affect the fulfillment of your customer orders?
4. What do you do when product delays happen? How do you avoid late deliveries to your customers?
5. How do you avoid stock-outs?
6. Do you have the capacity to fulfill new orders?

### **Picking and packing operations**

1. Do you fulfill your orders manually?
2. Do you manage the fulfillment of your orders by employee or by team?
3. Do you fulfill food baskets one by one? Or do you fulfill your orders by batches (For example by basket type)?
4. How long does it take to your employees to fulfill (pick and pack) one basket?  
Please provide the average time estimated to make these operations (hours or minutes).

5. Do your pickers follow the same route every time they pick (collect) and pack the articles from a specific basket?
6. Do you have an established average time to fulfill an orders (one basket)?
7. Do you register the amount of baskets (orders) that are pick and packed in your fulfillment centers? For example: how many baskets are completed per hour, per employee.
8. How do you avoid customers' orders being incomplete or with incorrect articles?
9. Do your employees have a way to verify if the products selected are in good conditions? Not damaged or squashed or with a valid expiry date.
10. Do you use special ways to collocate the products in the baskets?
11. Do you have any measure or indicator that allows you to know how many of the products become waste in your FCs?
12. How the products are located in your warehouse? By zones, areas, shelves, product type.
13. Are picking areas (zones) close or separate?
14. Do you organize your picking operations by family products (basket types)?

### **DELIVERY SERVICE**

1. Do you have any system that allows you to allocate your orders to the nearest and more convenient FC?
2. How long does it takes your company deliver an order from the sorting stage (baskets ready to be deliver) until customers' location? Provide an estimated time in hours.
3. Do you agree your deliver day and time base on customer needs?
4. Do you use any system or way to verify if the orders have been delivered in the time promised or if they have been delivered outside the time promised?
5. Do you outsource the delivery of your orders, or do you own the transportation to deliver your products?
6. Do you have special modes of transportation to preserve the products? For example: vans or containers with cooling systems, refrigerated vans or trucks with temperature control, cooling boxes etc.

7. Do you manage compensations for your customers when orders are delayed or incomplete?

### **SERVICE QUALITY AND CUSTOMER EXPERIENCE**

1. Do you use system to measure your customer satisfaction? For example surveys or other indicators (methods).
2. Do you have system or options to receive customer suggestions?
3. Are your customers satisfied with the time you take to process the whole order? Are they satisfied with your delivery options? Are they satisfied with the products they received?
4. Do your employees interact with the customer when delivering the product?
5. Do your employees have special guidelines on how to interact with your customers when delivering your products?
6. Do you have any options to deliver your orders in a shorter time?
7. Have you analyzed which strategies differentiate you from your competitors?  
For example: delivery service, products, price, service, website, record of customers purchase, special deals for customers: loyalty-discount cards, availability (100 % fulfillment) of products, personalization.

### ***Ending***

After finishing the interview key information will be transcribed and send to the participant for confirmation and agreement. After receiving interviewee approval the information will be used in the thesis. When finishing the thesis the participants will have a copy of the thesis if wanted.

Thanks for taking part in this project and for giving us your time and help. Have a nice day!