HEC MONTRÉAL

E-grocers in Canada:
Success factors and fulfillment strategies

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A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF REQUIREMENTS
FOR A MASTER OF SCIENCE
IN ADMINISTRATION

NOVEMBER, 2017

Abstract

Online grocery market dynamics have shifted with changes in consumer patterns and innovations over the past two decades. In Europe and the US, there are already many successful and experienced players. In Canada, the e-grocer business is relatively new. There are not many academic or real-life references explaining how Canadian online grocers design their business and fulfillment models. Furthermore, the Canadian market is rather challenging for the e-grocery business in terms of population density and logistics infrastructure. Therefore, we are aiming to find how the newly established Canadian e-grocers overcome these challenges and make decisions regarding their fulfillment strategies.

The literature review looks into previous academic works on the topics related to the dynamics of the online grocery market, fulfillment processes and models, and the business environment for Canadian online grocers. Based on the results of the literature review, a matrix of e-grocer fulfillment models is proposed as a conceptual reference for later analysis.

We have chosen the explorative case study as the main research tool, because the phenomenon under investigation is very recent in Canada, and has not been discussed in many academic works. Four in-depth case studies were conducted to reach our conclusions. Three semi-structured interviews were conducted with representative Canadian online grocers to collect insights from professionals. In addition, secondary data was collected from reports, official websites, news, and many other sources to improve the profoundness and validity of the case studies.

The results showed that the majority of Canadian e-grocers have chosen fulfillment models that require fewer investments and pose smaller risks. Meanwhile, they work to make trade-offs between costs and customer experience. Facing growing competition from both domestic and foreign companies, Canadian grocers frequently re-evaluate their business models and strategies, to adapt to the new market dynamics and sustain competitive advantages. This research contributes to the knowledge of the emerging Canadian online grocery industry. It also provides practical references for decision-makers in this field.

Key words: online grocery, e-fulfillment, perishable goods, Canada, supply chain, business model.

Résumé

La dynamique du marché de l'épicerie en ligne a évolué suite aux changements des habitudes de consommation et aux innovations apparues au cours des vingt dernières années. En Europe et aux États-Unis, il y a déjà de nombreux acteurs performants et expérimentés. Au Canada, le marché de l'épicerie en ligne est relativement nouveau. Il y a peu d'études expliquant comment les épiciers canadiens conçoivent leurs modèles d'affaires et d'exécution. De plus, le marché canadien est difficile pour l'épicerie en ligne à cause de la faible densité de population et l'absence d'infrastructure logistique. Par conséquent, nous cherchons à explorer comment les épiciers en ligne récemment établis au Canada surmontent ces difficultés et prennent des décisions concernant leur stratégie d'exécution.

La revue de littérature se penchera sur les travaux universitaires concernant la dynamique du marché de l'épicerie en ligne, les processus et modèles d'exécution, et l'environnement du marché canadien. À partir de la revue de littérature, nous proposons une matrice de modèles d'exécution pour l'épicerie en ligne comme référence conceptuelle pour analyse ultérieure.

Nous avons choisi l'étude de cas exploratoire comme principal outil de recherche, car notre sujet de recherche est très récent au Canada, et n'a pas été traité dans beaucoup de travaux académiques. Quatre études de cas approfondies nous ont menés à nos conclusions. Trois entretiens semi-structurés ont été menés avec des épiciers en ligne pour obtenir le point de vue de professionnels. De plus, d'autres données ont été collectées sur des rapports, des sites web officiels, des journaux et de nombreuses autres sources afin d'approfondir et de valider nos études de cas.

Les résultats montrent que la majorité des épiceries en ligne canadiennes ont choisi des modèles d'exécution qui nécessitent moins d'investissements et qui offrent moins de risques. Au même moment, ils cherchent des compromis entre les coûts et l'expérience client. Face à la concurrence grandissante venant des entreprises locales et étrangères, les épiciers canadiens réévaluent fréquemment leurs modèles d'affaires ainsi que leurs stratégies, pour s'adapter aux nouvelles dynamiques du marché et conserver leurs avantages compétitifs. Cette étude approfondit nos connaissances sur l'industrie émergente de l'épicerie en ligne. Elle fournit également des références pratiques pour les décideurs de ce domaine.

Mots clés : épicerie en ligne, exécution en ligne, biens périssables, Canada, chaine logistique, modèle d'affaires.

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1. Introduction

The online grocery industry started to emerge in the late 1990s with the establishment of several e-grocery companies (Hays et al., 2005). During the late 1990s and early 2000s, many e-grocers went bankrupt, or were bought by other companies. However, some e-grocers were able to achieve profitability and continue to grow their customer bases. They are able to provide their customers with good consumer experiences and competitive prices, and to earn enough profits to support their operations and make improvements. One of the reasons for the failure of many e-grocers could be that the consumers were not ready to purchase food online at the time.

However, the market dynamics of online retailing has dramatically shifted over the past decade. Disruptions have taken place in almost all retailing sectors: apparel, electronics, music, books, etc. (Lloyd, 2017). The disruption of the food and alcohol industries is just around the corner. Also, with the Millennials gaining more purchasing power, there are a lot of changes in consuming patterns that are shaking up the grocery industry. The Millennials are the digital origin generation; they have busy lifestyles and demand more online consumption and time-saving services. In this time of changes, many online grocers with innovative business models have appeared to fulfill these new needs.

Worldwide, the e-grocers in Europe (mainly the UK and France) are the most experienced and successful in this business (Wyman, 2014). Tesco, the biggest traditional grocery retailer in the UK, has led the way for other companies. Tesco was able to find ways to transform from a brick-and-mortar company into a profitable multi-channel online grocer, while limiting the additional costs and risks. In the US, Peapod keeps changing its fulfillment strategies with the development of business and new customer requirements. The Canadian market is late in adopting

the online grocery, and e-commerce in general, due to its special consumption patterns and logistics infrastructure. The online grocery industry started to experience its momentum in Canada around 2014, with the major grocery retailers such as Loblaws joining the competition (Sturgeon, 2014). The consumers are slowly adopting the habit of shopping for groceries online. However, the market is still very small, and logistics costs are high. In addition, foreign companies like Amazon are entering the grocery industry with aggressive strategies. All these phenomena have pushed Canadian online grocers to find business strategies that suit this unique environment. They have also raised the question: How do Canadian online grocers make decisions regarding their fulfillment models to overcome all these challenges?

1.1 The Structure of this Thesis

The remainder of this thesis is presented as follows: The second chapter introduces the theoretical background of the research, including a literature review of the e-grocery market, the e-fulfillment process, and the Canadian market and customers. Chapter 3 presents the research questions and the methodological design. In Chapter 4, we describe the findings of the four main case studies, and other case studies of Canadian online groceries. Chapter 5 is devoted to the analysis of all the data collected from the case studies. Lastly, we conclude with the answers to the research questions, and declare the potential limitations of the research and set out opportunities for future research.

2. The Literature Review

In this chapter, we first introduce the background of the online grocery business worldwide to facilitate an understanding of the research context. The second section reviews the dynamics of the online grocery business. In this section, we identify the opportunities and challenges of online grocery retailing. Then, we map the e-fulfillment process of the business. Next, a matrix of the fulfillment models is developed from previous studies on this topic. Finally, a typology of e-grocers is given as the reference of the case studies. The last section explores the nature of the Canadian online grocery market and its consumers to provide abundant information for building the environmental background of our research.

2.1 The Background of the Online Grocery Industry

According to Melton (2016), the online grocery business will account for 9% of total market sales of fast-moving consumer goods (FMCG) and be worth $150 billion worldwide by 2025. However, the delivery of perishable goods such as fresh vegetables, dairy and meat to households brings with it many logistics challenges. A common challenge for all e-grocery retailers is to be profitable serving a small customer base versus expensive fulfillment costs, including facilities, inventory, technologies, and employees. At the same time, selling groceries online provides numerous opportunities. It fulfills the needs of consumers who look for more value and convenience in grocery shopping. Today, many large players in e-commerce such as Amazon and Google want to have a share of this market, as well as some major brick-and-mortar grocery retailers such as Tesco and Walmart, who have reshaped their business strategies to adapt to the new market needs.

The online grocery retailing market is very fragmented and dynamic. The percentage of market share a company needs to achieve break-even depends to a great extent on the local markets. Take the US for example: The break-even point of

the online grocery business in Tampa is under 3%, but it is as difficult as earning more than 12% to break even in many other states with smaller populations (Wyman, 2014). Also, consumer patterns are very diverse. Some households are attracted by the convenience and time-saving benefits provided by e-grocers, while others want their daily food to be of a high quality and good for the environment.

2.1.2 Major Markets and Consumers

Online grocery shopping is more popular in some regions and countries than others. In Europe, the sales of online grocery retailing represent 6% of the market, while this figure is around 2% in the US (Morgan Stanley, 2016). In the Asia-Pacific region, the consumers show higher interest in shopping for groceries online: 37% of them say that they have already used an online ordering and home delivery service, while the willingness to shop for groceries online is much lower in other regions such as Europe (12%), Latin America (13%), and North America (12%) (Nielsen, 2015). It was predicted that the annual growth rate for online grocery consumers would be 15% in the UK, and the percentage of consumers would reach 10% to 12% by 2020 (Benn et al., 2015). According to Business Insider Intelligence, between 2013 and 2018, the compound annual growth rate was estimated to be 21.1% for the sales value of online grocery retailing in the US, and would reach $18 billion by 2018 (Smith, 2014).

Consumers worldwide are motivated to do online grocery shopping for different reasons. In Saudi Arabia, women cannot go out easily on their own to do the daily grocery shopping like women in other countries. Thus, online grocery shopping can be a practical option to make their life easier (Payfort, 2016). India is also doing some pilot projects in online grocery retailing which turned out to be very interesting. The Indian grocery retailing industry is very distinctive, with competition from the large numbers of "mom-and-pop" small grocers all over the big Indian cities. Fulfilling online grocery orders in India can be cheaper than in

many other markets, considering the high population density and the low labor cost. The popular "dabbawallah", which means "a man who delivers lunchboxes", is a huge part of Indian workers' everyday life. The lunch delivery system is based purely on delivery people using bicycles and the train networks. Benefiting from the low labor costs, transportation costs, and economies of scale (200,000 boxes per day), the unit cost of delivery is very low. Every customer is charged $5 per month to enjoy this service, which is extremely cheap compared to the cost of delivering fresh food in Western countries (Boer, 2010). Despite the low logistics costs, online grocery retailing will still be a tricky business in India. The lower prices provided by many small neighborhood retailers squeeze the profit of online grocers, and some "mom-and-pop" shops even take advantage of online coupons to supply their own businesses, which makes it difficult for retailers to win loyal customers to earn profits (Julka, 2016).

2.1.3 Major E-grocers

After many companies joined the "gold rush" of online grocery business in the late 1990s, many pioneers in the industry, such as Webvan and Streamline, failed to make profits and were forced out of business. However, a few companies, such as Tesco, Peapod, and Ocado, were able to turn a profit after finding the right path for their businesses. This phenomenon induced many discussions on the challenges and success factors of the major e-grocers.

Tesco, the traditional e-grocery retailer in the UK, has chosen a fulfillment model that has proven to be successful. As the biggest grocery retailer in the UK, it took 28% of the market in 2016 (Statista, 2017a). Tesco started its online grocery business in 1996 by providing a home delivery service to their established customer group. The orders were fulfilled by staff who pick products from one of its many stores (6,900 stores in 2017) all across the UK (Tesco, 2017). Today, it also operates e-grocery businesses in Poland, the Czech Republic, Thailand, South Korea,

and Malaysia (Wulfraat, 2014). In the beginning, Tesco fulfilled customer orders from its stores and had store employees preparing the orders. In this way, Tesco was able to avoid the huge investments in facilities and minimize the risks of new e-grocery businesses. Later, it switched to a hybrid model that combines store picking and the distribution center picking, to achieve a balance of cost and efficiency.

By contrast, Webvan, the best-known failure in the development of e-grocery, chose a completely different business model. Instead of expanding slowly as Tesco did, Webvan was very ambitious and invested huge capital in highly automated warehouses with a hub-and-spoke network. Lunce et al. (2006) point out that the major reason leading to Webvan's bankruptcy was that it expanded too fast, by opening 12 distribution centers (worth \$35 million each), and at the same time neglected the fact that there were not enough customers to use this capacity. The utilization rate of the warehouses was very low because of not enough business volume. In addition, they failed by overpromising to their customers. The "30-minutes" home delivery made the routing design too complicated (sometimes impossible), and too expensive. Based on a best scenario fulfillment cost analysis, the delivery cost in Webvan was as high as \$15 per order (Delaney-Klinger et al., 2003).

Peapod is one of the biggest online grocery retailers in the US. They deliver groceries to households from 24 states in the northeast coastal area of the US, and have delivered 40 million orders throughout the 27 years of being in business. Peapod provides the options of pick-up or home deliveries for its customers. Compared to companies such as Webvan, Peapod was able to achieve cost effectiveness in its fulfillment. First, it planned carefully before investing in dedicated fulfillment centers as well as atomized facilities inside the warehouses. The decision on the fulfillment method is highly flexible, considering the real needs of the business and market sizes of the local markets. Before 1998, Peapod picked from the stores of traditional supermarkets, where the layouts were not ideal for picking efficiency. After 1998, Peapod changed its fulfillment strategy. It worked

with traditional supermarkets to minimize the potential investments in infrastructure, and maximized economies of scale. In new markets, Peapod works with Stop & Shop and Giant Food Stores, and uses their store location to build attached "warerooms" to minimize the costs on infrastructure (Peapod, 2017).

Ocado is the only grocery retailer in the UK that is only based online. It is well-known for its cutting-edge technology, both in the robotic fulfillment facilities and software design. Unlike many other pure-play e-grocers who went bankrupt in the 2000s, Ocado was able to turn a profit in the year 2015, with revenue of £1,107 million, and continued to grow its profit in the next year with revenue of £1,271 million. Now the company operates three highly automated fulfillment centers in Hatfield, Dordon, and Andover, and is looking forward to starting the operation of a fourth one in 2018 (Ocado, 2017a; Ocado, 2017b). The size of a fulfillment center is one million square feet, and it carries over 30,000 stock keeping units (SKUs) (Profiter, 2013). Ocado invests heavily in technology, and wishes to maximize the picking efficiency and eliminate the number of low-skill workers in the fulfillment centers. Besides providing home delivery grocery shopping for customers, Ocado also provides fulfillment services for traditional grocery retailers, such as Morrison, who want to go multi-channel but avoid the risks of high investments at the same time. The technology-oriented company also plans to license its fulfillment center design to foreign companies to improve profitability.

Amazon has always been a pioneer in online retailing and logistics. In 2007, Amazon announced the debut of its online grocery business, AmazonFresh, in Seattle (Page, 2015). It currently serves households in big US cities such as Seattle, Los Angeles, San Francisco, New York, etc. The company provides same-day or next-day delivery for online grocery orders. The service costs $14.99 per month, in addition to the price of annual prime membership ($99 per year). AmazonFresh has adopted the model of fulfilling customer orders from their own local warehouses. Supported by its strong logistics capabilities, Amazon has built giant warehouses to provide as many choices of products as possible. For example, the warehouse newly opened in

Boston is 1.2 million square feet in size, and stores 95,000 SKUs, which is far more than an average supermarket could carry (20,000 to 50,000 SKUs) (Perez, 2016; Food Retail World, 2012). In 2016, AmazonFresh expanded its business internationally into the UK market. The company is shaking up the grocery business by providing low prices, a large range of choices, and fast delivery (Armstrong, 2016).

In addition to the big players in the market, there is also an enormous number of smaller e-grocers who provide innovative services, and operate on asset-light business models. A good example is the New York-based e-grocer Blue Apron. Since 2012 the company provides pre-portioned meal kits for busy households. In addition to selling groceries, the company also provides a convenient service that is similar to a catering service. Its fulfillment model is based on workshop-sized warerooms, where the raw materials are processed and packaged according to individual orders. The orders are preserved in refrigerated paper boxes, and delivered by the third-party carrier FedEx. By eliminating investment in warehouses, and avoiding the hassle of building its own logistics teams, Blue Apron could turn profitable in a short period of time.

2.2 The Dynamics of the Online Grocery Industry

To have a better understanding of the industrial background, we present in this section the dynamics of the online grocery industry from three aspects. First, we review the articles that discuss its opportunities and challenges. Next, we walk through the e-grocery fulfillment process, the decisions made in each step, and their characteristics. Lastly, we present a typology of e-grocers based on their fulfillment model choices.

2.2.1 Opportunities and Challenges of the Online Grocery Industry

The major challenge of e-fulfillment is to establish cost-effective and on-time deliveries for customers' orders. To meet these requirements, e-tailers should improve their information flows, as well as fully utilize their existing resources to achieve competitive advantages in the market (Lee & Whang, 2001). Ricker and Kalakota (1999) describe the key to success in e-fulfillment as follows: "Give customers what they want, when they want it, and how they want it, all at the lowest cost" (Ricker & Kalakota, 1999, pp. 1-2). Since the small packages shipped in e-commerce can be very costly and complicated, it is quite difficult to accomplish this task. As a result, the parties involved in the e-supply chain need to work together, to achieve cost-effectiveness and profitability.

Boyer and Hult (2005) emphasize the importance of integration among the functions of the supply chain, especially for e-grocers. The authors conducted case studies with four online ordering and home delivery grocers and their customers to understand the relationships among the supply chain functions. They found that it is crucial for e-grocers to match their marketing strategies with their operational processes, to meet customer expectations and to have ideal fulfillment performances. The identification of the success factors of the e-grocery business has always been a popular topic in studies concerning the e-grocery industry. For instance, Keh and Shieh (2001) conducted a comprehensive analysis of the e-grocery market to find out the opportunities, challenges, and other internal and external reasons that result in the rise and fall of companies. They found that the barriers to entry are quite low for new players in the market, because no one has sufficient experience in the new online grocery business. New players who have not been in the grocery retailing industry can start up as pure-players, and acquire first-mover advantages with innovative ideas.

2.2.2 The Order Fulfillment Process

The e-fulfillment process encompasses warehousing, picking and packing, distribution, delivery, and returns for e-commerce. In other words, it is the "end-to-end" process of e-business logistics (Straube & Lueck, 2000). A good performance in e-fulfillment enhances customers' satisfaction. It requires the integration of online customer interfaces, traditional inventory, order processing, warehousing, and transportation management, which are much more complicated than in traditional businesses (Hintlian et al., 2001).

According to Hübner et al. (2016), the order fulfillment process can be separated into back-end order preparation, and last-mile distribution. The authors mapped the complete fulfillment process (Figure 1), and the decisions to take in each step. In addition, they give two separate tables to conclude the design concepts of each fulfillment choice, and the pros and cons (Appendix 2).

Figure 2 illustrates the typical online grocery fulfillment processes, adapted from the conceptual design of the back-end and last-mile distribution of omni-channel grocers by Hübner et al. (2016), and other studies on the same topic. The fulfillment process of the online grocery business starts when the customer places an order online with a personal computer or a mobile application (app), and ends when the customer receives the order at the destination (at home or at a pick-up point). It can be separated into the order preparation, and the last-mile process. In the order preparation step, the order will be received by a store or a fulfillment center, where the picking of products and preparation of orders take place. The pickers can be staff in the supermarket, or a dedicated group of trained personal shoppers. If the order is prepared in a distribution center, the fulfillment process can be automatized, manual, or share characteristics of both. In the last-mile process, the online grocers have many choices to deliver the products to their customers. The most popular method is home delivery, where the grocer delivers to the customer's doorstep in the form of attended or unattended delivery. The task can be performed

by the in-house logistics of the grocer, or by a third party. Besides home delivery, customers can also pick up the order at a store, a pick-up point, or a third-party location.

Picking	Location	In-store	Separated Fulfillment Centres	Central Warehouse
	Automation	Manual	Semi-Automated	Fully Automated
	Integration	Separated	Integrated	Capacity Optimized and Integrated

Back-End Fulfillment

Delivery Mode		Home Delivery		Click and Collect		
		Attended	Unattended	In-Store	Attached	Solitary
Delivery Time	Velocity	Same Day	Next Day		Two or More Days	
	Time Slot	Specific		Undefined		
Delivery Area		Local	Regional	National	International	
Returns		No Return but Money-Back	Check and Return at Reception	CEP Return	Accept and Refund in Retail Outlets	

Last Mile Distribution

Figure 1. Characteristics and Design Parameters for Back-end Fulfillment and Last-mile Distribution in Omni-channel Grocery Retailing

Source: Hübner et al. (2016)
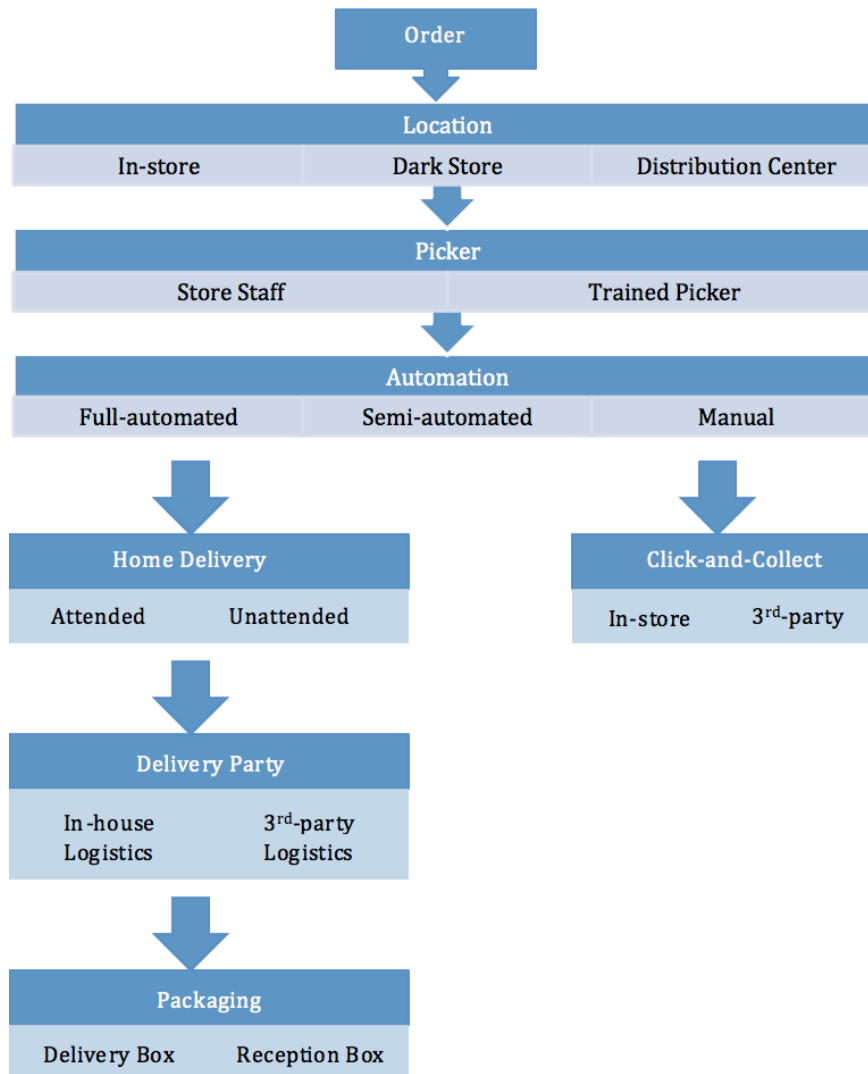
Figure 2. The Fulfillment Process of Online Grocery Shopping

Source: Adapted from Hübner et al. (2016) and other literature

Back-end Fulfillment Process

There are many elements to consider in order to design an efficient and cost-effective fulfillment process. Managers need to take decisions on where to pick the orders, who picks and prepares the orders, and the design of warehouses (if there is any). The purpose of these decisions is to make trade-offs between efficiency and cost in the order preparation process, and to satisfy the customer's expectations.

To start the order preparation, the e-grocer needs to decide where to store the products and where to pick them. When comparing the cost of the warehouse business model and the store picking business model (depending on sales volumes), and the break-even point of each model, Hackney et al. (2006) found that the warehouse models have greater advantages at high volumes, while the store picking models have a lower break-even point and are more suitable for smaller markets. A hybrid electronic grocery shopping system (EGS) that incorporates the structure of a traditional supermarket and home delivery can be more cost-effective and less risky (Punakivi et al., 2001). The author proposes the local distribution center (LDC) concept to improve fulfillment efficiency, and to lower total costs. The study suggests that online grocers should build their supply chains according to the market conditions (for example, average purchasing basket, total sales, resident density, etc.). Figures were given to measure the cost to build dedicated distribution centers (DCs) for the online grocery business. The results showed that it is more reasonable to build dedicated facilities when there are enough sales in a certain region. A hybrid business model was also proposed, in terms of which the new online grocery supply chain is built on existing facilities. This model is the most popular supply chain design among successful e-grocers such as Tesco.

Also, the fulfillment decision should be focused on designing a picking process and warehouse layout that meet the requirements of the business, to increase the picking efficiency and the utilization rate of resources. For example, a traditional supermarket is sub-optimized for picking, since the layout of the aisles is designed for shopping experience but not for picking efficiency. The dark store is a practical solution for some traditional supermarkets which want to start an online grocery business without significant additional investment. A dark store is a dedicated space attached to a supermarket, but the layout is ideal for picking efficiency (Treasure, 2017).

It is possible to build highly automated warehouses to increase picking efficiency. In the customer fulfillment centers (CFCs) of Ocado, the pickers do not need to walk around to pick orders, but rather pick the same products in a spot where all the customer orders come to them (Ocado, 2010). Although high levels of automation increase picking efficiency dramatically, it also increases the investment in facilities and operations.

Furthermore, the choice of pickers will largely influence the picking efficiency and cost of order preparation. Kämäräinen (2001a) proposes that the most significant field of cost reduction is to increase picking efficiency in the warehouse or supermarket. E-grocers should make tradeoffs in the decision of who picks the orders. A trained picker is able to pick up to 300 orders per hour in Ocado. The pickers need to be physically fit enough and able to select the products that meet customer requirements. In addition to training, the company also gives incentives to encourage higher picking speed, such as giving salary bonuses, or allowing early leaving if the picker has assembled the required number of orders (Ocado, 2010).

Last Mile Distribution

"Last-mile logistics" by definition includes the last movements of goods from the warehouse of the sellers to the households of the buyers or the collecting points. It is considered expensive and inefficient, since it usually represents 13% to 75% of the total logistics costs (Gevaers et al., 2011). Thus, the choice of last-mile logistics is critical for the performance of e-commerce. In the online grocery industry, the situation is even more challenging. The delivery of perishable goods (that make up the majority of products in the online grocery industry) is both expensive and delicate in nature. It requires temperature-control trucks and packaging, and well-trained specialists to handle the products. Wrong choices in last-mile logistics have led to the failures of many early e-grocers (Al-nawayseh et al., 2013).

In addition to cost reduction and delivery efficiency, customer satisfaction should also be carefully considered in the design of last-mile logistics. According to Esper et al. (2003), the shopping experience of last-mile logistics significantly influences the customer's willingness to shop on the same website again. Birse (2015) emphasized the importance of the service quality of last-mile logistics, since any loss of convenience in the online grocery shopping experience can result in the customers giving up on online grocery shopping entirely.

The home delivery service in the online grocery business is important for many consumers. For example, residents in London (IGD, 2013) and New York are encouraged to buy groceries online due to the low ownership of cars in big cities. Thus, by providing home delivery as a last-mile solution, e-grocers are able to attract more business volume. In the paper "The Way to Profitable Internet Grocery Retailing – Six Lessons Learned", Tanskanen et al. (2002) present a specific view of the real values created by the online grocery home delivery service. The authors explain that the main reason that consumers buy groceries online is that they save time and earn great convenience.

The home delivery service in the online grocery business happens in the form of attended delivery, with a scheduled time slot when the customers will be at home to receive the order. Alternatively, the order will be delivered without the presence of the customer and will be left at the door. As mentioned in the article of Hübner et al. (2016), attended home delivery increases the interactions between the online grocery company and the customers. Peapod uses its delivery drivers as ambassadors to improve customer service. However, attended delivery can also make the home delivery expensive and complicated. By contrast, unattended delivery makes it easier and cheaper for the company to deliver, but could also present problems, such as temperature control of the groceries and theft issues when the orders are dropped at the door. The orders can be packed in boxes or bags. The boxes are made of paper, or are reusable plastic bins that the e-grocer will pick up on the following delivery. Besides delivery boxes, some e-grocers also use the

reception-box method to deliver groceries. The reception box is a refrigerated box located at the household, where the customer can receive groceries. The delivery box uses an insulated paper box with coolers inside to keep the products fresh. A simulation conducted by Punakivi et al. (2001) compared the cost-effectiveness of the reception box and the delivery box in unattended home delivery. The results of the simulation showed that the delivery box could reduce delivery costs by 60%, and potentially accelerate the expansion of business, because the installation of reception boxes is expensive and customers are hesitant to use them.

Some e-grocers such as Tesco, Webvan, and Ocado operate their own in-house logistics teams to perform the delivery services. Tesco owns its vans and logistics teams, in order to have more control over the delivery process. However, it can be very costly, both for the merchant and the customers. Recently, Tesco raised its minimum purchasing value for home delivery from £25 to £40, with a surcharge up to £7. Compared to in-house logistics, third-party logistics (3PL) delivery is much cheaper, and costs around £3 per order delivery (Twentyma, 2015). Other companies, especially smaller e-grocers such as Blue Apron, use logistics service providers (LSPs), 3PLs, or transportation providers to lower the costs of fulfillment and improve customer service. They fulfill the orders from DCs in different cities, and deliver by local FedEx, using delivery boxes with ice packs, to the doorsteps of clients (Blue Apron, 2017). A study by Rabinovich et al. (2007) explains that the motivations for online retailers to work with LSPs are: 1) small investment in assets (facilities); 2) the uncertainty in fulfillment; and 3) economies of scale. Also, relations between e-commerce companies and LSPs are established because of their strength in consolidating the services and coordinating among networks.

In the attended home delivery scenario, the customers need to choose a time slot when placing an order. Researchers have looked into the different dynamics between the efficiency and cost of last-mile delivery with various customer densities and lengths of delivery windows (Boyer et al., 2009). The findings indicated that increasing the density of customers and lengthening the time window

increased the efficiency of last-mile fulfillment. Agatz et al. (2008) illustrate the challenges related to the time slots in online grocery home deliveries. Peapod, one of the few major e-grocers in the US, was carefully studied to support this point of view. The research found that e-grocers should make well-considered trade-offs in respect of customer satisfaction and costs when designing the attended home delivery strategy. The schedules of time slots can be shaped by limiting the offerings of time windows, and using differentiated delivery fees. By spreading the home delivery demands smoothly across the time horizon, the routing will be cheaper and easier (Kämäräinen et al., 2001b).

Apart from the designing of time slots offered for home delivery, e-grocers also need to pay attention to the routing of trucks, if they are using in-house logistics, to perform the last-mile activities. A strategy to simplify the routing task is to consolidate customer orders into the same time slot to achieve economies of scale. Vanelslander et al. (2013) explain that to reduce transportation costs, the routing of delivery vans should be carefully designed to shorten the total distance traveled. By identifying the most costly processes and limiting the costs related to them, e-grocers will be able to achieve cost-effectiveness in fulfillment.

Instead of the home delivery method, some e-grocers also allow their customers to place orders online and collect the orders in person. The potential pick-up locations can be in the store, in a drive-in lane near the store, or at third-party locations such as stores of collaborated companies and public transport locations. The pickup method can be beneficial both for the business and the customers. On the business side, it is less risky for traditional grocery retailers to start the e-grocery by initially providing click-and-collect. On the consumer side, it costs less to use click-and-collect than home delivery. Also, customers might want to check the quality of products inside the store before taking them home. A recent research by Colla and Lapoule (2012) explores the success factors of operating online grocery retailing in France with a click-and-drive business model. The click-and-drive model has advantages over the home delivery model on many aspects. The initial investment is

lower for the drive-in service, and only requires a separate area next to the store. According to an interviewee, the break-even point of such an investment is only 120 orders per week. Also, the logistics complexity and risks are eliminated, compared to home delivery. The majority of large French grocery retailers have already joined the click-and-drive grocery business, which captures more sales volume and entails a smaller risk. Peapod has set up pickup points inside the train stations in Washington, D.C., for the convenience of its busy customers who want to save more time by collecting their groceries on the way home.

Fulfillment Models

To choose a suitable fulfillment model is essential for the success of an e-grocery business. In the designing process, managers need to keep in mind the fulfillment process we described in the previous section, and make choices and trade-offs in each decision. There are many academic studies on existing models used by major e-grocers in the online grocery industry. Authors have also identified the strengths and weaknesses of these models.

Duval (2001) identified five e-grocer business models – the integrated model, the third-party shipper model, the drop shipping model, the delivery only model, and the multi-channel model – from eight real-life cases, including major e-grocers such as Tesco, Webvan, and Peapod. He describes each of these models with their advantages and disadvantages. The author also explains that the business model choice is not the only decisive factor in the success or failure of the e-grocery business. The execution and implementation of the business models, as well as the combination with other models, are also critical. Alvarez and Marsal (2016) describe three existing fulfillment models (see Appendix 3), including traditional (store picking), dark store (pick in dark stores), and centralized (pick from DC), along with their strengths and weaknesses. Also, the cost drivers of each model are presented to compare the costs of these choices. The authors recommend that e-

grocers find the ideal fulfillment model for growing fulfillment volume by working towards multiple goals, including customer satisfaction, flexibility of growth, the implementation of technology, operational performance, and cost efficiency. A typology of e-fulfillment models (Table 1) is proposed by Chakravarty (2014). The six models are: Direct home delivery – from the warehouse, store, or third party, or consolidated from multiple sources; and customer pickup at the store – from stores or consolidated from multiple sources. FreshDirect, for example, falls into the category of direct home delivery from the warehouse, while Tesco fulfills from stores and delivers to homes (currently, they fulfill from warehouses in addition to stores).

There are many available methods for the fulfillment process, but there is no single perfect model for every scenario. Some of these models have advantages regarding one aspect, but they have disadvantages regarding others. Hays et al. (2005) give insights from the successes and failures of e-grocers. The authors observed and analyzed the fulfillment models and cases, and present the pros and cons of these fulfillment methods. For example, companies such as Webvan and FreshDirect have competitive advantages over brick-and-mortar retailers because they do not own expensive locations like stores, and have the economies of scale for "pooling" the inventories together in a few DCs. However, these internet-based companies share the disadvantage of high fulfillment costs from expensive logistics and facilities. According to the authors, the most profitable and least risky business model is to start the online grocery service from a brick-and-mortar retailer who has a customer base and fulfills orders from the store. When the business has a stable group of customers and requires more efficient fulfillment, it can consider involving a dedicated DC in the order fulfillment process. Ricker and Kalakota (1999) presented five e-fulfillment models (as shown in Table 2), with their strengths, weaknesses, and managerial challenges (see Appendix 1). Companies can use this table as a managerial guide, and choose the fulfillment models depending on their situations.

Table 1. E-fulfillment Models

Source: (Chakravarty, 2014)

		Customer	
		Home Delivery	Pick up at the Store
Supplier	Warehouse	X	
	Store	X	X
	Use 3rd Party	X	
	Consolidate from Multiple Sources	X	X

Table 2. A Summary of Five Fulfillment Strategies

Source: (Ricker & Kalakota, 1999)

Fulfillment Model	Characteristics
Distributed delivery centers	Distributed operation sites; self-operated
Partner fulfillment operations	Distributed operation sites; partner operated
Dedicated fulfillment centers	Centralized operation site; self-operated
Third-party fulfillment centers (3PFs)	Centralized operation site; third-party operated
Build-to-order	Spans both centralized and distributed operations

2.2.3 The Fulfillment Matrix

After reviewing the literature, we are able to build a typology matrix to classify the typical online grocery fulfillment models, adapted from the matrixes presented by Boyer and Hut (2005), and Lang and Bressolles (2013). In their article "Extending the supply chain: Integrating operations and marketing in online grocery industry", Boyer and Hut illustrated a matrix (Figure 3) that presents the four different operational choices of the online grocers identified in their case studies. This study explored the relations between marketing-operation integration and customer behavior intentions in e-business. We are going to use this basic structure, since it gives a clear method to classify e-grocers based on different fulfillment choices. However, the descriptions in this typology on fulfillment models are too abstract, and cannot be used solely to provide references for our research.

To complete the conceptual framework, we use the matrix of multi-channel fulfillment strategies of online retailers proposed by Lang and Bressolles (2013). The matrix in this article (Table 3) is more relevant to our research on identifying and describing the details of fulfillment models. In addition, it also gives the indicators to measure the quality of fulfillment strategies from economic performances (costs) and customer expectations (satisfaction levels) to measure fulfillment performances.

Based on the two matrixes described above, we built the matrix "The Matrix of E-grocer Fulfillment Models" (Figure 4), comprising the four major fulfillment choices used by e-grocers. The classification is based on the choice of order fulfillment and last-mile delivery. The different choices in locations and last-mile methods result in the diverse levels of customer experiences and total costs of these strategies. On the X-axis and the Y-axis, we can measure the costs and customer satisfaction to evaluate the performance of different fulfillment choices (Chopra & Meindl, 2007).

Order Fulfillment

	Store-based	Distribution Center
Indirect	(1) Semi Extended	(3) De-Coupled
Direct	(2) Fully Extended	(4) Centralized Extended

Delivery (vertical axis label)

Delivery Cost: Low (top) → High (bottom)
Customer Convenience: Low (top) → High (bottom)

Low ← Picking Efficiency → High
Low ← Capital Investment → High
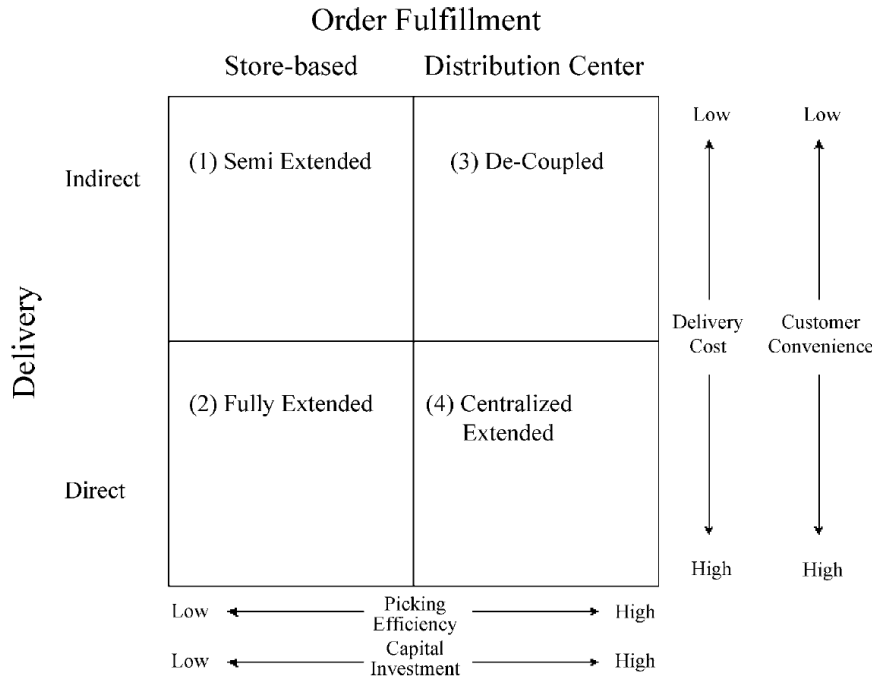
Figure 3. Research Design for Operational Differences in Grocery Delivery

Source: Boyer and Hut (2005)

Table 3. The Four E-fulfillment Systems

Source: Lang and Bressolles (2013)

		Delivery to the customer	
		Home delivery	**Pick-up in-store**
Order preparation	**In central distribution center(s)**	Products are picked, prepared, packed, and expedited from a central warehouse or distribution center(s) (de Koster, 2002a)	Orders are prepared in central warehouse(s) (picked, prepared, packed, and expedited), are delivered, and kept ready for pick-up in the store (Agatz, 2009; Lee & Whang, 2001).
	In store	Products are picked, prepared, packed, and expedited from one of the existing stores of the retailer (de Koster, 2002a; Smith & Sparks, 2009; Yrjölä, 2001).	Products are picked, prepared, packed, and kept ready for pick-up in the store (Agatz, 2009; Berman & Thelen, 2004; Durand & Gonzalez-Féliu, 2012).
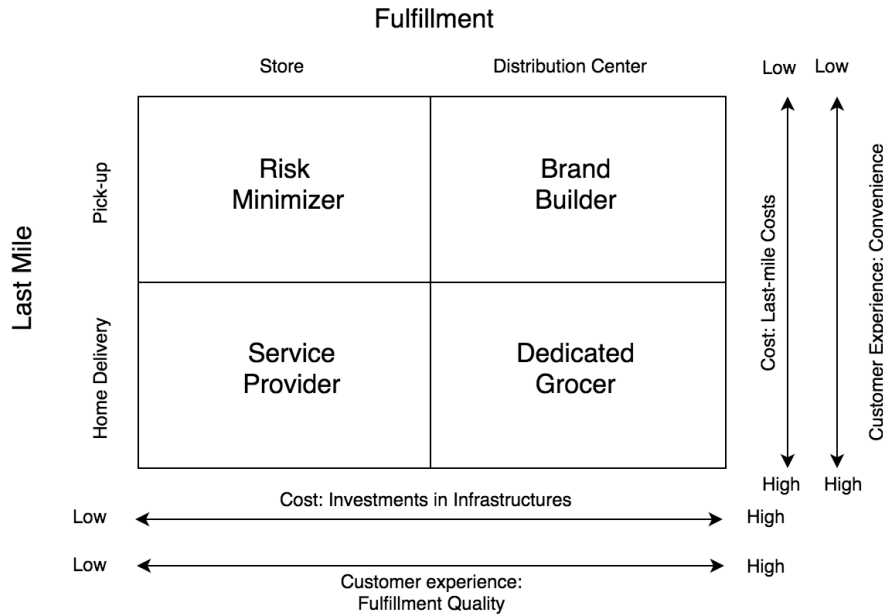
Fulfillment

Figure 4. The Matrix of E-grocer Fulfillment Models

Source**:** Adapted from Boyer and Hut (2005), and Lang and Bressolles (2013)

Risk Minimizer

Many traditional grocers start their online grocery businesses with the first type of fulfillment model, to minimize costs and risk when the market is still small. In most cases, the grocery retailers fulfill customers' orders directly from the stores, and charge a fee for the picking and assembling of products. The customers perform the last-mile tasks themselves, instead of the grocer. As a result, the company does not need to consider the delivery issues. Customers benefit from the saving of time and energy in grocery shopping activity.

This fulfillment model provides additional shopping options and convenience for the customers from a traditional grocery store. The pickup location can vary among retailers and according to customers' needs. It can be in stores, in the parking lots (drive-through locations), or at third-party locations (pickup points or train stations). The downside of using such a fulfillment method is that a big percentage

of online grocery consumers are not served. The model only provides the minimum level of convenience compared to other models. Many online grocery consumers experience difficulty going to grocery stores, and prefer to have the products delivered to their doorsteps. In addition, fulfilling the online orders directly from the stores is not very efficient, and might bring cannibalization to the grocer's existing customers.

In Canada, e-grocers usually start their online grocery business by testing out the market with a click-and-collect grocery service in some stores located in Ottawa and Toronto. By starting an e-grocery business with the click-and-collect model, Walmart is able to provide customers with extra shopping choices and convenience. Furthermore, it can take a smaller risk at the beginning, and wait for the consumer group to grow. Recently, the company also began to deliver to three Toronto Condo building locations, where customers can pick up the orders downstairs at a scheduled time (Brown, 2017).

Brand Builder

The second fulfillment model is usually used by pure-play online grocers to increase their influence and expand their market share in the grocery business. These e-grocers only fulfill their orders from distribution centers, because they do not own stores, and they let the customers pick up the orders from third-party locations (other stores, metro stations, or pickup facilities). In another scenario, traditional grocers can fulfill orders from dedicated distribution centers, to achieve efficiency and economies of scale. Later, these orders are delivered to the stores for pickup. In practice, very few e-grocers use only this fulfillment model to serve their customers. Instead, they provide order pickup as an option, in addition to the home delivery service.

Fulfilling orders from distribution centers is expensive in upfront investment but

more efficient than fulfilling from stores. Some multi-channel grocery retailers such as Tesco started to fulfill part of their online orders from fulfillment centers when their online business volume increased. By contrast, pure-player Peapod collaborates with Stop & Shop and Giant (two traditional grocers) to allow customers to pick up orders from stores of their choice. Recently, Amazon opened its first brick-and-mortar store in Seattle, and is planning to open grocery pickup locations for the AmazonFresh business. Pure-play e-grocers opening pickup points or collaborating with brick-and-mortar retailers can overcome some of the drawbacks (for example, high last-mile costs) of e-grocery shopping, and provide more shopping options for customers.

An example of a pure-player that uses this strategy is Peapod. Today, the company only prepares orders from their distribution centers. If customers wish to pick up orders instead of having them delivered at home, they can go to a Stop & Shop store or a Giant Store to collect the product. These two store brands belong to the same company, Ahold USA, who also owns Peapod.

Service Provider (Multi-Channel)

The service provider fulfillment model is widely adopted by many traditional grocery retailers who want to better serve their customers by delivering groceries to their doors, and to win back market share from the pure-players. Also, the grocers usually combine this store picking, home delivery method with the option of the store pickup method, to provide flexibility to the customers. Usually, the supermarkets deliver the orders with their own trucks and drivers. Since this fulfillment model does not require investment in an expensive distribution center, it avoids bringing huge financial burdens to the e-grocers. The customers pay assembling and delivery fees for the convenience. These fees can partially cover the costs for the e-grocers to operate such services.

However, as mentioned before, preparing orders in store is not always the best option when it comes to efficiency, because the layouts of stores are not ideal. Also, the quality of products can be affected to a great degree by the conditions of stores. In addition, the order fulfillment processes compete with store customers. Even traditional grocery retailers tend to start with the service provider fulfillment model; they will gradually add dedicated warehouses and distribution centers when the consumer bases grow to a certain scale.

Tesco is a typical example of a traditional supermarket that began e-grocery by fulfilling customer orders from stores. When starting the home delivery service, Tesco had store staff use trolleys to go through the store aisles and pick the orders. The store picking method was cost-effective and less risky. However, this strategy was later proven to be inefficient and labor-intensive. The number of SKUs that a customer could order was also limited because of the assortment of each store. In addition, cannibalization could happen among the customers. In 2006, Tesco launched its first dedicated fulfillment depot, which increased fulfillment quality and cost-effectiveness, since the business volume had increased (Wulfraat, 2014).

Dedicated Grocer

The dedicated grocers aim to provide their customers with high-quality products as well as great convenience. The majority of the pure-play e-grocers belong to this category. Their home delivery services and products are more attractive than those of the traditional grocers. Also, because pure-play e-grocers do not own storefronts, the storage, picking, and packing are all carried out inside the distribution center, where the whole process can be very efficient. Depending on the nature of the business, the fulfillment activities in DCs can be highly automated, manual, or a combination of the two. However, there are also some downsides to this method. First, the initial investment can be very high if the warehouses are big and highly automated. Second, the capacity of the warehouse might not be fully used if there is

not enough business volume, which can also lead to high operational costs. In addition, some workers could complain about the harsh working environment. For example, in the chilled zone where the temperature is too low for humans to work for eight hours, the workers can have health issues.

The case of Webvan is a typical example of failure. Its story reminds other pure-play e-grocers to invest carefully in automated warehouses and other expensive facilities at the beginning. It also indicates that investment decisions should be taken depending on the market conditions and customer needs. By contrast, many smaller and regional e-grocers such as Blue Apron try to lower the risk of significant investments at the beginning. They often use manual fulfillment in well-designed DCs and third-party logistics to deliver the orders.

2.3 The Canadian Market Background

The Canadian e-grocery market has its own special characters. Unlike the US market that has a longer history in online shopping, Canada is still in its infancy stage in online retailing. The logistics situation is very challenging: Because the population density of major Canadian cities is much lower than those of many other cities in the world, such as London, New York, and Paris, the costs of delivery are higher. To understand the market dynamics, we also need to understand the customers. The last part of this section briefly describes Canadian e-grocery shoppers and their preferences.

2.3.1 The Canadian Grocery and Online Grocery Market

Annual sales in the Canadian grocery market were 79 billion Canadian dollars (CAD) in 2016, which accounts for 15% of the total sales (532.21 billion CAD) in the retailing industry (Statistics Canada, 2017). In Canada, the online grocery economy is smaller than 1% of the total food consumption, while in other countries such as

the UK and the US, the figure is 4% and 3% (Canadian Grocer, 2016). Similarly, compared to the $7 billion of online grocery sales in the US in 2015 (Statista, 2016b), the sales number of Canadian online grocery business was rather small: It was estimated to be 1.18 billion CAD 2015. This figure is expected to reach 3.6 billion CAD by 2019 (Statistics Canada, 2017; Canadian Grocer, 2016). On the other hand, profit margins in the grocery retailing business are very thin, that is, 1% to 3% on average, much lower than those in other industries (Government of Canada, 2016). As a result, to be profitable, Canadian grocery retailers rely primarily on high volumes and low operating costs, or they have to be innovative enough to increase their profit margins. In short, the Canadian online grocery market is still smaller than many other major markets such as the UK, Europe, and the US. However, the business volume is expected to take off in the long term, with the gradual shift in consumer patterns and grocers' business models (Sagan, 2016). When the market becomes enthusiastic about online grocery shopping, with all the big traditional grocery retailers rolling out their e-grocery businesses, the competition is also going to be fierce.

In Canada, there are many supermarket retailers, as well as small or specialized grocery shops. The top three grocery retailers, Loblaw, Metro, and Sobeys, accounted for 63.4% of the market in 2015 (Statista, 2016a). These three retailers have already joined the online grocery business to increase their market shares. Loblaw provides a "click-and-collect" service in 60 of its stores across Ontario and British Columbia (Sagan, 2016). IGA and Thrift Foods, which belong to Sobeys, offer both home delivery and store pickup grocery services. Metro also started an online grocery service at the beginning of 2017 to deliver groceries to households. In addition to the major grocers, many pure-play smaller startups also entered the competition. The majority of Canadian e-grocers are avoiding risks at the beginning, in order to understand the market before making huge investments. Since online grocery shopping is very new in Canada, there are almost no previous examples they can learn from, and there are very few studies on this topic, e-grocers need to develop their own strategies from scratch, or learn from companies in other

markets and make adjustments accordingly.

2.3.2 The Canadian E-commerce Landscape and Delivery Costs

The Canadian e-commerce market is rather small compared to other markets. In 2016, e-commerce sales were 34.04 billion CAD, and accounted for 6.5% of total retailing sales (EMarketer, 2017). During the same period, e-commerce sales in the US were 322.17 billion USD (Statista, 2017b). The low sales volume in e-commerce can be attributed to several reasons. The first reason is the small population compared to many other countries. Second, many Canadian consumers tend to purchase from US websites, since the two markets border each other and share many similarities. In addition, the poor presence and service of local Canadian online retailers discourage consumers to shop locally. Despite the difficulties of operating online businesses, Canadian e-commerce is starting to take off. By the year 2020, e-commerce sales will reach 55.78 billion CAD, and will account for 10% of total retail sales in the Canadian market (EMarketer, 2017).

Distribution costs are a big concern for many Canadian e-tailers. It is more expensive to deliver business-to-consumer (B2C) orders in Canada than in many other countries such as the US and the UK. The Canadian population spreads widely across a vast landscape, and thus there are very few national distribution hubs to dispatch packages all across the country. Also, there are very few national less-than-load (LTL) carriers. Most of such carriers are small in scale, and only operate regionally. As a result, the unit cost to ship orders in B2C is not cost efficient (Purolator International, 2013).

Since the shipping costs are high, e-tailers mark up on the delivery fees for Canadian consumers. According to a survey, 68% of consumers hesitate to shop online because of the shipping costs (Purolator International, 2015). As a result, many Canadian e-grocers choose to avoid home delivery totally, and only provide click-

and-collect. Others try to collaborate with local third-party logistics companies to lower delivery costs.

2.3.3 Canadian Online Grocery Consumers

Canadian consumers are already used to the idea of online shopping. 90% of Canadians shop online multiple times every month (Warc, 2017). However, they still hesitate to welcome the idea of e-grocery. According to a survey, only 15% of consumers said they had bought groceries online in the year 2016 (Abraham, 2016). In addition, this small group of consumers only spends 4% of their food budget online (Shaw, 2016). Canadian grocery shoppers hesitate to buy groceries online because of potential quality issues regarding fresh products and high delivery fees (Abraham, 2016).

Despite all the difficulties, the online grocery business is growing steadily. In the long term, Canadian consumers will gradually adapt to the idea of online shopping, and will spend 10 % of their grocery money online in the next 10 to 15 years (Sagan, 2016). Also, the consumer pattern will change with the younger generations joining the consumer group. The Millennials, the generation born after the 1980s, are considered "digital natives". According to a study, 30% of them have bought groceries online, among whom there is a higher percentage of older millennial consumers who have families and enough consumption power (Karolefski, 2016). The Millennials who start to have households see online grocery shopping as a time-saving method that brings great convenience in life.

2.4 Conclusion

In the literature review chapter, we went through research articles on the online grocery fulfillment process, the opportunities and challenges in the business, the fulfillment models, and the Canadian online grocery environment. The key for e-grocers to win this challenging business is to design a suitable fulfillment model, considering the market nature, customer needs, and fulfillment costs. Most publications focus on the well-established e-grocers, including Tesco, Ocado, Peapod, and Webvan. There are few publications on smaller or newly established e-grocers who operate with other business models. Also, the e-grocers who have been studied frequently are all located in mature markets such as the US, the UK and Europe. There are not many scholars who have discussed this topic in terms of academic works, or given practical suggestions for Canadian e-grocers. For this reason, we find it is necessary to look into the development of e-grocery in Canada where the business is emerging. E-grocers are facing big challenges, but there are also great business opportunities. This research will explore the dynamics of Canadian e-grocers, and their fulfillment strategies and aims, to fill the knowledge gap in the field of e-grocery retailing.

3. Methodology

Our research purpose is to explore the fulfillment choices of Canadian online grocery retailers. Since online grocery shopping is a rather new phenomenon and there are very few studies focusing on the Canadian context, we chose a qualitative research method. In order to reach detailed and profound research findings, we need to build our theories on real-life cases of players in this particular market.

Qualitative research studies are studies that do not reach their results using statistical procedures. Instead, they are based on non-mathematical analyses, and aim to interpret phenomena and find relations among parties (Bickman & Rog, 2008). Compared to the quantitative research method, the qualitative method is more widely used in the field of social sciences and business. Also, for complex everyday situations, isolating the variables and conducting quantitative research can be tough. Instead, a qualitative approach can consider the real-life conditions of the phenomenon. In this way, it improves the practical value of the research findings (Flick, 2009). As a result, a qualitative research method is the best approach to conduct our research.

The following section introduces how the research was conducted, the methods and tools employed to achieve the results, how data were collected and analyzed, and the validation and limitations of this research. We present the methodology part in the following order. In the first section, the main research question and the sub-questions are introduced. The second section gives the main research tools, the case study method, the reasons we have chosen it, the criteria for case selection, and how we analyze the data. Lastly, we shall give the validations and limitations of this research.

3.1 The Research Questions

To serve the main purpose of this research, we need to break down the topic into two main aspects: 1) The fulfillment strategies used by Canadian e-grocers; and 2) the challenges in this business, and the strategies to overcome them. These two main questions are also answered by their sub-questions presented as follows:

RQ1. How do Canadian online grocery retailers fulfill their customer orders?

Sub-question a: What are the fulfillment models of Canadian online grocery retailers?

Sub-question b: What are the reasons for such fulfillment choices as mentioned above in sub-question a?

RQ 2. How do Canadian online grocery retailers face their present and future challenges in their e-fulfillment process?

Sub-question a: What are the present and future challenges in the online grocery industry in Canada?

Sub-question b: How do Canadian online grocery retailers overcome these challenges?

3.2 Research Tools and Data Collection

In this section, we introduce the different research tools used in this research to collect and analyze data. Case study is the principal research method of this thesis. We collected primary data from the semi-structured interviews with e-grocers. In addition, secondary sources were also studied to complete the data set. In the end, we justify the choices of these research tools and how we used them in practice.

3.2.1 The Case Study

The purposes of our research are to find out "what" fulfillment models Canadian e-grocers use, "why" they make such choices, and "how" e-grocers face present and future challenges. According to Karlsson (2010), this set of "what', "how", and "why" questions are most suitable for case studies that will help to analyze complicated phenomena. Also, the results of case studies will provide interesting insights that may benefit practitioners. To have both exclusive conclusions on individual cases and insights that can be generalized across the industry, we will investigate the cases from the perspective of two different phases.

Although there are many publications on e-grocery fulfillment, there is none focusing on the Canadian market. We can only have a limited understanding of the e-grocery fulfillment process from studies in other markets from secondary sources. In order to have more details and reliable findings on Canadian grocers, we need to base our research on primary data collected from Canadian e-grocers.

First, we conducted in-depth case studies for each case to have a profound understanding of the individual situations, their fulfillment designs, and how they face challenges. The intra-case analysis is essential to this research, because it helps to eliminate important patterns and information in complex individual cases (Rückert-John, 2009). The analysis of individual cases alone will not be sufficient to answer all the research questions. To find the reasons e-grocers choose different fulfillment models, we need to organize the cases into sets, in order to find within-group similarities and differences (Karlsson, 2010). Organizing cases into sets will help to find the causal links among a set of complex real-life situations (Yin, 1994).

3.2.2 Case Selection

We chose four Canadian e-grocers who are highly representative of the industry, and who all have special characteristics in the designs of their fulfillment strategies. The decision regarding the number of cases to use in case studies is important, since too few cases will result in biased results, and too many will limit the profoundness of the findings (Karlsson, 2010).

We applied several criteria to select the cases. First of all, our study aims to identify the different fulfillment strategies in the Canadian e-grocery industry and the reasons for these choices. We selected e-grocers with different business models in order to bring a degree of diversity to the samples. Second, we limited the cases to companies which sell perishable goods and keep the inventory themselves. Compared to those e-grocers who fulfill customer orders from other grocery stores, these e-grocers face bigger fulfillment challenges to keep their own warehouses and products. Third, we chose companies serving different customer groups in terms of income and requirements from e-grocery shopping. In addition to the main cases, we have also selected five other cases that are less typical but rather unique in their fulfillment model choices. Thus, we found it is also necessary to present them to achieve a more comprehensive perspective in the research findings.

3.2.3 Interviews

Semi-constructed interviews are the main source of data in this research. Since the Canadian e-grocer business is still emerging, special market characteristics cannot be fully observed from the market research based on secondary data. The information provided by managers was most helpful to identify these characters. All the companies are private-owned enterprises, whose information is not comprehensive in public sources. We needed to rely on face-to-face contacts to acquire these managerial insights on their fulfillment strategies.

In the interviews, we looked for answers from the following aspects: 1) Managers' views on the e-grocery business in Canada; 2) the fulfillment models the e-grocers chose, and the reasons for choosing them; 3) the present and future challenges in e-grocery fulfillment; 4) how they face these challenges; 5) the impacts of the fulfillment choices on the current business performance; and 6) what will be the future trends of the Canadian e-grocery industry.

We reached out to four different online grocery retailers across Canada not limited by location. Since the online grocery business is still very new, there was limited choice to select a few examples to represent each type of grocer. In the end, we had the chance to conduct semi-structured interviews with three of the online grocers. The dates and locations of the meetings were selected by the interviewees. The interviews were all face-to-face, lasted around one hour each, and took place in the companies' head offices. Two of the interviews used the method of audio recording, and the remainder used the note-taking method. Since the interviews were semi-structured, the interviewees had the freedom to lead the discussion to issues they thought were important. In this way, we were able to collect information on new topics that had not been identified in the literature review.

3.2.4 Secondary Data

Besides conducting interviews, we collected secondary data from the companies' official websites, news media, and other reports from reliable sources. To better understand the cases, we took into consideration background knowledge about the market, the competition, the demographic characteristics, the geographic conditions, the logistics infrastructure, etc. For one of the four cases, we could not get an interview with the managers in this company. As a result, in this case, we collected all the information from secondary sources. Finally, the data on the five additional cases were collected solely from secondary Internet sources without the insights of

professionals, because we use them as references to the main cases instead of drawing conclusions from them directly.

3.3 Validation and Limitations

There are several validation issues and limitations we need to address regarding the design of the research. On the validation side, we chose four cases for conducting in-depth analysis, to help achieve generalization in the results (Yin, 1994). Also, data triangulation is realized in the case studies. We combine secondary data from multiple Internet resources with primary data collected in the interviews, to increase the reliability of the information (Ellram, 1996).

However, by using the case study as the main tool, we also face some limitations. First, because of the nature of case study, the results cannot be generalized to the general population. Second, some of the companies studied are new to the business and do not have much online information available. Furthermore, the interpretation of the interview results can be biased because of the opinion of the observer (Voss et al., 2002).

4. Findings

In this chapter, we present the cases of the four Canadian online grocery retailers that were studied. Two of the cases are startup companies that do not have any physical presence in the market, and the other two are both traditional grocery retailers who regard online grocery shopping as an additional channel. With the combination of similar and diversified cases, we are able to identify consistency in management choices in similar situations, and different decisions based on individual conditions. In addition, we will also briefly look into other Canadian online grocers, in order to have a more comprehensive perspective on the model choices and challenges of the online grocery business. Lastly, we will summarize the key information from the main cases in a table, and conclude with the major findings from the case studies. In Table 4, we have summarized the information on the four main cases we have selected.

Table 4. Information on the Case Studies of Four Canadian E-grocers

Company	A	B	C	D
Years in online grocery business	2	3	1	3
Nature of company	Small to medium startups	Small to medium startups	Large grocery chain stores	Large grocery and phamacy chain stores
Order platform	Website	Website	Website	Website, phone, tablet
Products	Meal kits; Snacks	Meal kits	Perishable groceries, home supplies	Perishable groceries, Pharmacy products,Beauty products; home supplies.
Delivery fee and method	No delivery fee; Unattended home delivery	No delivery fee; Unattended home delivery	Order more than $50; $4 for assembling the order, $4-8 for home delivery; Attended home delivery or click-and collect at one of the 3 stores; 2-hourtime window for both delivery and pickup.	Order more than $50; $ 3-5 for assembling the order;$10 fee for orders not picked up; Click-and-collect in more than 100 stores
Service area	National	National	Local	Local
Fulfillment model	Dedicated grocer	Dedicated grocer	Service provider	Risk minimizer
Location to prepare orders	Warehouse	Warehouse	In store	In store (drive-through)
Picking	Manual picking without automation	Manual picking without automation	Manual picking with hands-free scannners	Manual picking with hand-held sanners
Packaging	Insulated paper box with ice packs	Insulated paper box with ice packs	Plastic shopping totes	Plastic shopping totes
Last mile operations	Outsourced to 3rd party carriers	Outsourced to 3rd party carriers	Operate its own fleets; Temperature controlled trucks; 3rd party drivers and route planning	N/A

4.1 Company A

Recently established, Company A is a meal kit subscription service provider, which delivers pre-portioned meal kits customized to what the customers demand. Their meal kit contains all the cooking ingredients (including fresh produce, meat, and

spices) according to the recipes they design for a specific week. The company allows customers to specify their meal preference (vegetarian recipes, for example). The customers receive a weekly box of between 8 and 30 portions of fresh grocery products. The price for each meal depends on the order size.

According to the interview with the executive from Company A, the majority of their customers are small families and young professionals who are time-starved. They deliver around 35,000 meals per month all across Canada. A customer order usually contains multiple recipes. A customer order is confirmed one week in advance, that is to say, the order is automatically placed each week if the customer does not cancel in advance. The demand is rather stable, except for the holiday seasons when customers go on vacation (when there could be a drop in sales). Due to this stable consuming pattern, the planning is not too complex. After the customer orders are confirmed each week, buyers make replenishments from local suppliers. Buyers order the least perishable goods first, and the time-sensitive products such as meat and fresh produce last. By ordering only what they need, Company A can follow a just-in-time inventory strategy that saves them warehouse space, and limits food waste to less than 1%.

The fulfillment center is operated manually with three temperature zones, a freezer where all the ice packs are stored, a refrigerated room to store the fresh produce, and a room temperature zone that is also used as the assembling area for the orders. The order preparation happens in their warehouse, and is performed by their warehouse staff who portion the ingredients into independent recipes, except for meat products, which are already portioned by the suppliers. After the recipes are prepared, the recipe bags will be relocated on an assembly line. Another warehouse staff member assembles the customer orders individually, according to the recipes and the number of portions ordered. Later, all the ingredients are packed into an insulated paper box that contains multiple ice packs. This design of packaging allows the ingredients to stay fresh up to 48 hours when shipped all across Canada. Also, all the packing materials are recyclable, which is appreciated by the customers.

Since the company ships nationwide with an unattended home delivery model, where the customers do not have to wait at home for the orders to arrive. It is important to keep control of the product quality in many different, unexpected environments and situations.

Company A provides free home delivery to customers across broad geographic regions. This poses a significant challenge in terms of fulfillment costs and quality. Company A uses the services of multiple logistics companies. This choice of last-mile fulfillment method benefits the company, both in terms of finance and service quality. First, owning a full logistics infrastructure with trucks and drivers would be too much of a financial burden for a start-up company. In Canada, the meal kit customers are not located in cities as high in density as many international cities such as New York or London. As a result, economies of scale cannot be realized in the short term, and the investment in logistics would be unaffordable. Furthermore, managing and scheduling the routing of trucks and scheduling of drivers take a large part of management resources. Using third-party logistics helps the company to focus on its core competency, namely developing recipes and sourcing high-quality ingredients for their busy customers. In addition, Company A also benefits from the logistics providers' experience and widespread networks across Canada, so that a large number of Canadians have access to this service. The orders are shipped by truck to local and closer destinations, and by air to distant destinations. According to the interviewee, their shipping fee is not more expensive than the average cost of shipping a parcel in Canada, because their products are not shipped in refrigerated environments.

Given the special market conditions in Canada and the nature of their business, Company A faces many challenges. First, the penetration rate of the online food industry is less than 1% in Canada, which is very low compared to the rest of the world. Canadians are still quite resistant to the idea of buying groceries online. However, the company sees this as a good opportunity, since they believe there is going to be a digital transformation in the food industry, and there will be

exponential growth. To overcome this difficulty, the company needs to win the trust of customers, by constantly providing them with high-quality fresh products and great experiences. Their business is based on customer loyalty and word of mouth. This puts more pressure on purchasing, logistics, and customer service. As mentioned above, they use a just-in-time replenishment strategy that ensures the freshness of the products, and ship them with insulated boxes. When unexpected situations happen (like failure to deliver), the company would compensate customers to ensure an overall positive customer experience.

Their next challenge is related to the growth of the company and capacity. The company had to expand their warehouse from 4,000 square feet to 10,000 square feet when their business volume grew. They also need to revise their layout and fulfillment process often, to achieve an optimal level of efficiency. The company is currently looking for more technology-oriented solutions in its fulfillment center. Also, the order preparation process might change with their growth. For example, local suppliers would not be able to follow their requirements and volumes if their growth reaches a certain scale. They will need to procure in bulk to reduce the unit cost, and hire more workers to portion their ingredients for the recipes.

In addition to the challenges in terms of product quality and logistics costs, the executive from Company A mentioned that companies which operate online grocery businesses in Canada also face language and cultural barriers. They have to develop recipes that are loved by most people, and involve local sourcing to satisfy the customers. However, in Canada, it is difficult to source locally in winter. The majority of the supplies come from the US and Mexico. Company A had to source from faraway locations, but they will still choose local products over others if it is possible. The interviewee also explained that international companies will try to enter the Canadian online grocery market, but they will experience difficulty in Quebec due to the need to operate in French.

Looking towards the future, the interviewee believes that there will be more competition from more specialized players, as well as from big companies such as Amazon which are looking forward to entering the food sector. Company A suggested two strategies to face these challenges. First, they should perform the last-mile service of grocery shopping better than the big players. The company is looking for opportunities to satisfy more meal needs of their customers. Second, with more busy people wanting their meals quickly and easily, and the growing acceptance of buying groceries online, they are looking forward to providing more convenient meal solutions, including healthy snacks.

4.2 Company B

Company B is also a company that provides meal kits across Canada. The co-founders of company B realized that there was a void in the meal kit service industry in Canada. As a result, they created the business, starting on a small scale. Since its creation, the company has been experiencing rapid growth. The business volume grows by up to 20% each month, and the customer base has been expanding rapidly as well. The business model of Company B is similar to that of Company A. Company B provides different choices of meal kits each week, assembles customer orders, and sends them all across Quebec, Ontario, and Maritimes. The service is also based on a subscription membership. The customers need to choose their meals for the week, or skip the week if they do not want to buy for any reason. Each meal costs between 8.75 and 11.00 CAD, depending on the meal preferences and portion sizes. Compared to shopping in a traditional supermarket, using the service from Company B is a pricey choice. However, the company adds value to their products by sourcing mainly from high-quality local sources, and provides extensive convenience for the consumers. Because of the nature of the service, the majority of customers of Company B are people who have rather higher incomes, and who are looking for a healthy way to simplify their meal choices. The people who buy frequently are professionals who have small families and do not have time to do

grocery shopping. They are willing to invest in this service in order to eat well and spend more valuable time with their families.

Company B fulfills their customer orders in the fulfillment center, where they receive, store, and assemble the fresh ingredients. The warehouse has a refrigerated zone at 4 degrees Celsius and a freezer at -22 degrees Celsius. For now, they do not perform many portioning processes to the foods, since most food items are pre-packed by their suppliers. As a result, there is less concern about food safety issues. The fulfillment operation is based on a conveyor system. First, the workers build the boxes. Then, they add shipping labels and packing sheets to the boxes. Next, the ice packs are added, and the meat products are placed on the ice packs. Finally, the recipe bags are put into the boxes before they are closed.

The company follows a "pull" fulfillment strategy, which means they only start to assemble the products after the customer orders are confirmed. The whole supply chain starts when the weekly orders are confirmed by the system. They will plan the procurement with suppliers in advance, but confirm the ordering quantities one day before the delivery. Each planning and procurement cycle lasts around four days. For instance, when the customers confirm the order on Wednesday at midnight, the procurement, receiving, and packing will take place on Thursday, Friday, Saturday, and Sunday. On Monday, the customers will expect to receive the boxes of their weekly groceries at the door.

The top concern of Company B is the freshness of their products, since their customers have high expectations regarding the quality of products. To ensure the freshness of products, the biggest challenges are the different environments and lengths of transit time. First, Company B worked with its packing supplier to design a well-isolated box that could stay cold and fresh for up to 48 hours without a refrigerated environment. Also, they change the number of ice packs in the boxes depending on the outside temperatures and transit times. For example, in the summer time, there will be three ice packs in a box instead of two. The ice packs are

most effective when they are still very solid. For this reason, the packing team only takes a few ice packs out of the freezer, as they are needed. They also source the products mainly from local suppliers. In this way, the transit time from the suppliers and the warehouse is greatly reduced. Another reason to source locally is so that they can deliver the products fast when they are needed. The operation of the company follows a just-in-time fashion. They make sure procurement happens right before the products are packed, to extend their freshness. Anything that is left will not stand over to the next week. They give the very few leftovers to their employees. Lastly, they recommend that their customers put everything in the refrigerator as soon as they receive the boxes, to make sure the foods are good when they are cooked.

Apart from providing freshness, Company B also wants to serve as many customers as possible in different regions in Canada. This choice puts enormous pressure on the logistics costs of the last-mile delivery, especially in remote areas. For instance, when they deliver to one or two households in a remote location, the company will not even make a profit, because there is no economy of scale in the delivery fees. However, they see this as a long-term investment to grow a bigger customer base. The growth in customer base in these areas will eventually make the deliveries profitable. Furthermore, if the company needs refrigerated transportation, the cost will be much higher. The growing number of customers will help to spread the additional cost of refrigeration. In addition, to further reduce the logistics costs, Company B tries to consolidate their orders to fewer carriers to obtain better rates. However, they still need to retain a certain variety of carriers in case some of them cannot deliver for any reason.

Working with many different carriers is not easy. Company B needs to work with both big national carriers to have better geographical coverage, and more specialized local carriers to provide higher quality services. Not having direct control over the last-mile delivery process can have a huge influence on the fulfillment quality. According to the interviewee, many traditional carriers are not

used to the requirements and procedures for fresh food delivery. For example, Company B demands that carriers follow the no-signature-required (NSR) procedure when delivering the boxes. However, the employees in carrier companies are used to the training of "not leaving packages unattended". So when the customers are not at home, they will take the food boxes back to the warehouse. Sometimes, they forget to deliver one pallet on the promised day, and plan to deliver the next day. For traditional businesses and other online businesses such as apparel and books, this will not be problematic. However, for the online fresh food business, it will result in a direct loss in the value of goods and very negative customer experiences.

For Company B, the customer experience is a big part of the added value in their business model. The customer experience consists of several parts, including the website experience, the quality of the food, the delivery rate, the service quality of the driver, and the after-sales service. The last-mile delivery is considered as an extension of customer service. The interviewee of Company B mentioned that some of the drivers would text the customers to inform them of the approximate time of the delivery, even including a picture of the boxes. This kind of additional service is highly appreciated by the customers. Also, many customers leave special instructions to the drivers to put the boxes in specific places, or with other people when they are not at home. To make sure the customers are satisfied, the company works hard with their carriers to make the last-mile delivery a good experience.

As a company undergoing rapid growth, Company B is experiencing "growing pains" as well. Since the customer base expands by 20% monthly, they have had the challenge of running out of capacity since the business launched. The greatest challenge now and in the future is that there is not enough freezer space to hold all the ice packs. In the summer time, the usage of ice packs increases by 50%. The ice packs have to stay in the -22-degree Celsius environment all the time before they are added to the insulated delivery boxes. The solution to this issue is to have their ice pack supplier deliver more often but in smaller volumes, and to follow a just-in-

time strategy that they translate into the delivery of ice packs almost on the same day. Also, on the supplier side, the supplier might face the pressure of producing more ice packs for Company B with its rapid growth. In the long term, the company will have an additional warehouse and proper infrastructure to increase their capacities. More space will allow the company to put the food operations in the temperature-controlled zones, in order to have more optimized quality control. On the labor side, the company faces a similar situation. They need to hire more than ten employees per week, since the fulfillment process is very manual, and the portioning of bulk ingredients (except the meat products) and packing all rely on human manipulations.

The interviewee believes that people are increasingly open to the idea of buying grocery online, and the growth of the online grocery market is accelerating. As a result, there will be more competitive entries from the traditional supermarkets such as Walmart, as well as online retailers such as Amazon.com. However, the interviewee does not see this as a big threat, since Amazon.com will help change consumer habits that will eventually bring more business for Company B. If Amazon.com enters the market and starts to provide a similar kind of service, it will become a competitor. In the short term, this is not likely to happen. However, in the long term, Company B still needs to think about the strategy to face this challenge. The plan is to build a strong brand, and give good service in order to have loyal customers when Amazon competes in terms of price and logistics.

4.3 Company C

Company C is a traditional grocery retailer which has hundreds of chain stores, and has decades of experience in the grocery industry. It is one of the top grocers and has a significant market share of the Canadian grocery business, and is already making a good profit every year. It owns a few banners, with a diversity of small community stores, large stores, and discount food stores.

The company has been going through a phase of digital transformation over the past few years. It launched a new website with online flyers, recipes, and product information. Also, it launched its loyalty program to give customers more personalized promotions and to track consumption patterns. The loyalty program is also accessible online and through mobile devices. The online grocery business was launched as part of its strategy to have digital integration of all its services. The online store provides around 20,000 products. Almost all the categories of offline products are well represented online.

To use the service, the customers need to create an account online, enter their location, add products to virtual baskets, and select the time slots for home delivery or store pickups. The time window for delivery and pickup is two hours. The orders are prepared the day before delivery, so customers can choose the time slot from the next day to up to 10 days in advance. To use the service, customers need to order to the value of at least 50 CAD, and pay an assembly fee of 4 CAD. The home delivery will cost an additional 4 to 8 CAD, depending on the time selected. For now, the online business is a small operation, with three stores delivering all the online orders. Also, not all existing customers have access to the online grocery service yet. However, the company plans to expand the business following positive responses from the market.

Company C has chosen a unique way to fulfill its online customer orders. Unlike its many start-up competitors who fulfill orders only from warehouses, it fulfills the orders directly from one of the three stores located at Montreal Island, Kirkland, and Laval. It also involves a certain amount of technology in the picking process. After an order is placed, it is transferred to one of the stores. The order information goes into the computer system of the store. All pickers in the store use hands-free scanners where they receive the customer orders and items to pick. The device also tells pickers where the products are located, so that they can go there easily and fast. Pickers are trained to pick a specific kind of product: Room temperature,

refrigerated, and frozen products. Also, they pick up to six customer orders at the same time using a trolley. Once an order is picked, it goes into temperature-controlled storage before the delivery or pickup. The company also owns their temperature-controlled trucks, to make sure the fresh chain is not broken. Some of the deliveries are performed by third-party contractor drivers, but in Company C's own trucks.

As a traditional grocery retailer with many operations over a wide geographic range, Company C has many different challenges than Companies A and B. First, operating the online grocery business is highly complex for Company C. Launching the online grocery business was difficult and time-consuming. It took two years to plan the project, and one year to develop and finally launch it. Because Company C's operational structure was built around the traditional business, it is complicated to make decisions. The e-commerce team had to work closely with the operations department and the IT team to build the user interface, and the proper operations to fulfill orders. Also, since the company is new to e-commerce and customer behavior is shifting a lot, many of the decisions are experimental and have to change constantly according to the feedback from e-commerce store managers and customers. In addition, Company C is very conscious of expanding slowly. The interviewee of Company C indicates that expanding too fast will bring complexity and might make it hard to monitor the quality of this service.

Similar to other companies which are in the online grocery business, Company C also considers quality and customer experience as the most important aspects to control. Since the biggest concern of people shopping for groceries online is receiving products that are not as fresh as those in stores, it is vital to earn their trust and provide good experiences. Company C has installed special temperature-controlled storages in stores and trucks, in order to ensure the peak quality of the products. Regarding customer experience, the company tries to make the process easy and convenient. For example, if one of the products in the order is missing, they will put substitutes in a separate bag. Upon delivery, the customer can decide if

he/she wants the substitute or a refund. Also, if customers are not satisfied with what they receive, they can return the bags to the driver and get a refund very fast. To better monitor the operational performance of on-line delivery, there are frequent reviews of the order preparation process in stores and customer experience, in order to constantly improve service quality.

Another aspect that concerns managers is the efficiency of order preparation. Compared to picking in a warehouse as Companies A and B do, picking in a store is naturally less efficient. According to the interviewee, a well-trained picker can pick up to approximately 500 items per hour in a warehouse, and only 90 to 110 items per hour in a store. To overcome this disadvantage, the company optimized the picking process by investing in technology and training. As mentioned before, the wearable devices allow the pickers to pick multiple orders at the same time, and make it easier and faster. Compared to other multichannel grocers who pick the orders in a completely manual way, Company C is able to pick with much higher efficiency than its rivals in the same business.

Another task for Company C is to plan the routes for the last-mile deliveries. Since the efficiency of the delivery is crucial and the management resource is limited, the company decided to work with a service provider. The drivers from the service provider deliver the orders in Company C' trucks, and its planners also plan the routes for Company C. By outsourcing part of the last-mile tasks, the company can focus on the major issues in their online grocery business.

As mentioned earlier, the average profit in the grocery business is between 1% and 3%. As a result, e-commerce has less room to make mistakes, and it is crucial for Company C to make sure they can make profits from the additional online grocery business. When the traditional grocers start to sell online, they often face the risk of cannibalization, as the online channels and offline stores under the same company are competing for the same group of customers. However, the interviewee from the company does not see this as a threat, since they are acquiring new customers with

the online service. Furthermore, the customers who shop online are actually spending 30% more than offline customers. Although customers have to pay additional fees for home delivery, the fees cannot cover the additional costs of last-mile service. That is to say, the company earns even less of a margin when selling online than selling in a store. However, the company believes that they will make more profit in the end. Because the customers are buying more, there are economies of scale in terms of the purchasing of goods, operations, and last-mile deliveries.

Since the company owns its own fleet to deliver the online orders, it is important to find the most economical way to operate the transportation operation. For now, there are not yet enough customers to have a certain level of economies of scale. As a result, the company works to consolidate customers by delivering from only three stores locate on Laval, Kirkland, and Montreal Island (although there are more stores in these areas). By doing so, the costs of launching online grocery shopping and transportation are spread over more customers. This strategy also makes the operations and routing less complicated for the management team.

In order to achieve economies of scale, company C has to attract many customers to their online service. They need to convince their actual customers to try out the online service, to acquire new customers who want to buy online, and to attract family shoppers who have bigger purchasing baskets but who are deal hunters. The systematic digital transformation allows existing customers to easily use all the company's other services such as membership and rewards on the website. Thus, they have more opportunities to use the online grocery service as well. For the deal hunters, they can have the same promotions online as in the stores. For a long time, there were not many decent online grocery options out there for customers in need. People such as busy professionals, handicapped groups, and the elderly, who actually need online grocery services, will become new customers as well.

Company C believes the time for online grocery shopping will come very soon. They want to be ready before the huge growth arrives. However, in the long term, they face competition from different players. First of all, the company faces competition from the pure-play online grocers, which have different business models and many investors behind them. Their services are more internet original, and might be more attractive to the younger generation. Also, foreign players such as Amazon.com, which has strong logistics capacity and can offer very low prices, will eventually enter the Canadian grocery sector.

4.4 Company D: Loblaw

Loblaw is a traditional grocer which has abundant experience in grocery retailing. It is listed among the biggest food distributors in Canada. It has a widespread network of more than 2,000 stores nationally. In addition to the grocery banners, it also purchased the pharmacy chain Shoppers Drug Mart in 2014. Similar to Company C, Loblaw has experienced a phase of digital transformation.

Today, the click-and-collect service is available under three of the company's banners: Loblaw, Zehrs, and Real Canadian Superstore. This broad network covers the service area of the Greater Toronto Area (GTA), Ottawa, and all the provinces in West Canada. The online grocery stores provide around 20,000 different products, including perishable goods, home supplies, pet products, beauty products, and over-the-counter medicines. The customer can place an order on the website, on a smart phone, or on a tablet. When placing an order, the customer will select a pickup location. Most of the pick-up locations are parking lots or drive-through spaces. There are also two locations available in Toronto where customers can pick up the orders from a truck. The customer needs to reserve a 2-hour time slot to visit the store. Same-day delivery is possible if the order is placed four hours before the pickup time. The service costs 3 to 5 CAD, depending on the popularity of the time selected, and requires a minimum order value of 50 CAD.

After receiving the orders, the store has a team of specially trained pickers, known as "personal shoppers", to pick the products for the customers. The picker uses a trolley that carries up to 12 reusable bins for different customer orders. A hand-held device helps pickers to locate the items, and to suggest the most efficient route to go through the aisle. The picker scans every item after picking it. If the picking is incorrect, the scanner will beep to signal the mistake. To monitor and improve the quality of the picking activities, the pickers are evaluated on their picking accuracy, productivity, and efficiency. Also, some of them are specialized in picking items from a certain area in the store. When the customers have special requirements on their orders, such as the ripeness of fruit, the pickers will follow the orders precisely to satisfy the customers. Also, when a stock-out happens on a certain product, the picker chooses substitutes according to the customer's instructions. The assembled orders are stored in a multiple-temperature area, consisting of freezers, refrigerators, hot ovens, and room-temperature shelves, to ensure the top quality and conditions of the products. When the order is ready, the customer needs to drive to the dedicated parking area for the click-and-collect service. He or she will make a phone call to inform the employees inside. Then, the employee will bring the order to the car, and load the products inside the trunk of the car. At this point, the customer can inspect the products to ensure the quality and accuracy. Then the payment can be made through a credit card online, or a debit card on a point-of-sale (POS) machine.

The majority of customers who use this service are Millennials, busy families, and baby boomers. According to the vice-president of the e-commerce team, the Millennials are always connected to the Internet. They are more open to the idea of buying groceries online. For busy families, especially parents with small children, the service allows them to save the headache of time-consuming grocery shopping. They do not need to watch over the children when shopping for groceries. Also, for old people who do not have the strength to go inside the store and wait in lines, click-and-collect can be a good choice.

Similar to the challenges faced by other e-grocers, the biggest concern of Loblaw is the profitability of providing the online service to its customers. As described by the company, the profitability is "razor thin" in the grocery business. With the deflation of food prices (Rogus, 2017), and competition with other major grocers in Canada, the margin in the online business is even thinner. Also, to establish the online shopping platform and the operations to support the service, the company has invested a great deal in equipment, additional employees, and IT. In addition, the minimum incomes in Alberta and Ontario have increased (Strauss, 2017). Since the operations rely heavily on labor, the cost of fulfillment will be even higher. To offset this unfavorable situation, Loblaw decided to avoid the expensive last-mile costs by only offering a click-and-collect service to online customers. First, the company did not invest heavily in trucks and equipment to deliver. Second, the operational costs are lower without the salaries of drivers and gas bills. According to a study by McKinsey & Co., the profit margin on pick-up is 13.8%, while for home delivery the profit margin is 10.7% (McClearn, 2015). Meanwhile, Loblaw is also encouraging more customers to use the service in order to even out the investments and operational costs.

Fulfillment efficiency is another area on which Loblaw is working hard, since the layout of stores is designed for the customer's convenience but not for optimal picking up speed. Every store has a concierge who schedules the fulfillment activities on each day. This concierge also decides when to pick the orders and when to release the orders. The pickers are monitored on their picking performance in real time. When a picker is falling behind schedule, the scanner will remind the picker, and ask if the person needs help. The scanners the pickers use also help them to navigate to the locations of items. In this way, they do not waste time looking for items or walking a longer route than necessary.

Currently, Loblaw offers the click-and-collect service in 140 supermarkets under its three banners, Loblaws, Zehrs, and Real Canadian Superstore. This represents many

stores across wide geographic regions, and the operations and control can be highly complex. Also, with the popularity of click-and-collect, many customers are anticipating the service coming to their stores. As a result, the time to market is critical. Furthermore, since the company is offering the service in its three different supermarket chains which have different products, customers, and operations, the management and coordination are even more challenging. For now, the company has only launched the online grocery business with click-and-collect last-mile fulfillment. This model choice allows the company to roll out the online service rapidly and less costly. Also, the user interfaces and operational designs of the three different stores are quite standardized. All these strategies combined have made the operations for online grocery shopping much easier.

To attract more customers to join the service and retain loyal customers, Loblaw needs to deliver great customer experience in the online grocery business. The company believes that most customers do not like the idea of waiting at home for two hours to receive groceries. Instead, they would rather come to the store, or pass by after work to pick up their orders. As a result, Loblaw only focuses on improving the pickup experience. When the order preparation has started, the store manager will send a notification to the customer. Once the order is ready, the customer will receive another notification. When the customers come to pick up the orders, they can drive to reserved drive-through areas dedicated for online customers. The pickup takes around five minutes to complete, which is much shorter than the two hours waiting at home. One of the biggest concerns of online grocery customers is the quality of the food chosen by other people instead of themselves. The company has trained their pickers to pick the top quality products, the products with the freshest expiration dates, and to take into consideration the special instructions from customers. Also, at the picking location, the customers can check the condition of the products they get, to make sure they get the anticipated quality.

As a traditional grocery chain with diversified businesses, Loblaw tried to make some changes to adapt to the dramatically shifting business world. The operations

are based on the traditional distribution channel. They needed to provide a suitable environment for the emerging e-commerce. In 2012, Loblaw established the branch "Loblaw Digital" to work on digital solutions, and operate the online channel for Loblaw. The "click-and-collect" e-commerce project was also developed and operated by this branch. Loblaw Digital is the team that allows the traditional company to focus on the core business and, at the same time, to seek changes without disrupting the day-to-day operations of the company. Also, Loblaw acquired the national pharmacy chain Shoppers Drug Mart in 2014, which is more profitable than the grocery business. This acquisition has improved Loblaw's profit margin, and might serve as the strategic locations for its online channel in days to come.

The future challenge for grocers such as Loblaw is the competition from other traditional supermarket chains such as Walmart, and big online retailers such as Amazon.com. These two grocers together will put a lot of pressure on Loblaw to further develop their online business, in order to be more appealing to consumers. Since Walmart's market overlaps with that of Loblaw, they will be strong competition for online customers. With the announcement of Amazon's purchase of Whole Foods, the Canadian grocery market was disrupted with uncertainty. There are 13 Whole Foods stores in Canada that could be brick-and-mortar starting points for Amazon to enter the Canadian online grocery market. With its strong logistics framework, Amazon will be able to deliver fresh groceries to customers' homes. The CEO of Loblaw stated that if it would become necessary to compete with Amazon, the company would consider home delivery as an option. "Our job is to meet our customers' needs" (Shaw, 2017).

4.5 Other Companies

In addition to the typical cases described above, other companies are present in the Canadian grocery market. For example, Walmart has been a major player in the

supermarket business. It started its click-and-collect online grocery business in 2015 (Shaw, 2015). Now it also has a delivery service to certain areas in Toronto. Recently, Walmart announced the removal of the assembling fee for store pickup, believing that it would encourage customers to use their online service even more. Walmart is known for its every-day-low-price strategy and fulfillment performance. It is seen as a big threat to the Canadian multi-channel grocers and a strong potential rival to Amazon in the future.

Grocery Gateway, belonging to Longo's, is an experienced online grocery company based in Mississauga since 1997. It delivers online groceries to the homes of customers. The customers can choose a 90-minute time window, and pay around 10 CAD to use the service. There is no pickup option available. Before 2012, the orders were picked from Longo's stores. However, after the increase in business volume, the company experienced capacity issues. It switched from a store-picking model to a warehouse-picking model. Later, the company also expanded its warehouse from 50,000 square feet to 150,000 square feet. Since the online customer group is growing rapidly, the warehouse fulfillment model allows Grocery Gateway to have better control over their inventories, and to fulfill orders more efficiently. The company does not believe other companies will join the online grocery delivery business very soon, because of the expensive last-mile costs (Kopun, 2016).

Lufa Farms is a Montreal-based company that grows vegetables and herbs in a rooftop greenhouse with advanced technologies. It also applies a subscription business model, allowing customers to choose what they want in their weekly baskets. Customers can only pick up their grocery boxes at their chosen pickup points (coffee shops, convenience stores). After the orders are confirmed, the pickers start to pick the vegetables directly from the greenhouse during the evening. As a result, there is no waste or expiration problem regarding the fresh produce. The produce comes together in reusable plastic bins. The pickers push the carts with products around the warehouse to put products into separate customer order bins on the shelves. Apart from vegetables, people can also buy bread, meat

products, and other groceries, supplied by small local stores, on the Lufa Farms website. Drivers visit all these stores in the early hours every day to collect the products for that day's orders. Later, the drivers deliver the customer order boxes to the pickup points. This fulfillment model helps the company to operate a just-in-time method. Also, since Lufa Farms only delivers to pick-up points, it can consolidate orders and plan the most economical routes, thereby largely reducing the last-mile costs.

To fulfill the void of home delivery left by many big name grocers, many last-mile solution companies such as Urbery and InstaBuggy have bloomed. These two companies offer just-in-time personal shopper services for all the products selling in local stores, including groceries, pharmaceutical products, and alcohol. These companies hire many personal shoppers to go to one or many local retail stores, to buy according to customers' orders. The prices on these sites are slightly higher than average. In addition, they charge a delivery fee, depending on the order values. The whole fulfillment process is real-time and fast. For example, InstaBuggy promises to deliver as little as one hour after the order is placed. Urbery's personal shoppers communicate with customers via messages throughout the shopping activity to keep them updated. The customers can have very specific requirements regarding their products, and indicate alternatives when there is a stock-out on certain items they want. Also, the delivery person can inform the customers of the time of delivery. Now, after three years in business, Urbery has stopped the personal shopper service, and has switched to offering e-commerce logistics solutions to retailers. Similarly, many local grocery delivery services have been established and disappeared in a short time span. These types of grocery businesses are to some extent a digital replication of the "milk boy" service that has existed for decades. In this more time-pressed and more digitally connected age, we are seeking more options like this to optimize our efficiency. However, the profitability and consistency of this model has not yet been proven.

4.7 Comparisons and Conclusion

In this chapter we have studied the cases of four typical Canadian online grocery retailers. Figure 5 shows how the cases fit into the matrix of e-grocer fulfillment models. Company A and Company B are small-to-medium-size start-up online grocers, which have chosen a similar asset-light business model and a dedicated grocer fulfillment model. On the matrix of fulfillment models, they fall into the category of dedicated grocers who fulfill their orders in warehouses and deliver the orders to the customer's home. This fulfillment model allows for the optimal level of fulfillment efficiency and customer experience. However, this model can be costly for e-grocers.
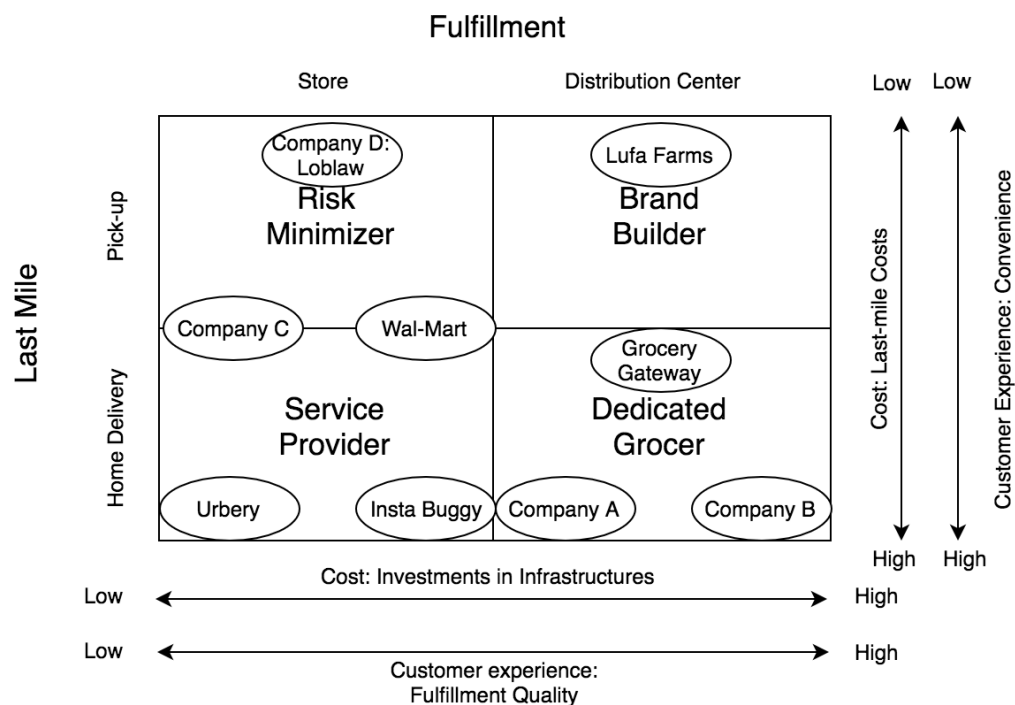

Figure 5. The Fulfillment Choices of Canadian E-grocers

Although Company C and Company D (Loblaw) have similar business models, they have chosen very different e-commerce fulfillment strategies. Company C offers

both home delivery and store pickup to their customers, while Company D only lets their customers order online and pick up at stores. Company C belongs to both the service provider and risk minimizer category. The fulfillment strategy allows customers to have an extensive level of convenience, but the store fulfillment strategy helps to limit the total fulfillment costs. Company D decided to take less risk in e-commerce. Thus, it used the risk minimizer strategy, where orders are picked in stores and customers can only pick up the groceries they have chosen at stores. This model is the least costly among the four types. However, the customer does not enjoy as much service and convenience.

Other grocers such as Wal-Mart chose to start with a risk minimizer model, but gradually added home delivery to limited locations in high-density areas such as Toronto. Grocery Gateway applies a dedicated grocer model similar to Company A and Company B. Lufa Farms is the only one using the brand-builder strategy. The reason for this choice is that the company aims to build an urban farming solution instead of the grocery business alone. Urbery and InstaBuggy operate on a service provider strategy, without owning the products themselves. This model is ideal for start-ups that do not have much capital. They take on the market where the customers need a fast and high-quality last-mile service to make their lives easier.

5. Analysis

This section analyzes the findings from the case studies of Canadian online grocers. We first identify the most frequently used online grocery fulfillment models in Canada. Then, we describe the features of these models, and their advantages and disadvantages. In the next section, the major challenges for the Canadian online grocery business are identified. Some of these challenges have been answered well by the online grocers, while others are yet to be solved. The following part presents future trends and challenges. Finally, we give the conclusions and takeaways of our analysis.

5.1 Major Fulfillment Models in Canada

Although there are many strategies available in the global market, Canadian grocers have chosen a few specific models that are more suitable for the local markets. We identify three typical model choices, the asset-light dedicated grocer, the multi-channel traditional grocer, and the last-mile solution provider. Each of these models represents the fulfillment decisions of some Canadian e-grocers. Detailed managerial decisions are described, and diagrams will be used to illustrate the decision flows. In addition, we look into the reasons for e-grocers to choose these models.

5.1.1. The Asset-light Pure-play Dedicated Grocer

The asset-light pure-play fulfillment model is used often by start-up companies. They usually do not have much capital to start their operations. As a result, they invest lightly in infrastructure such as automated facilities and in-house fleets. They are pure-players, who serve the customer solely from a warehouse and deliver the order to the doorstep of the customer. In this model, the picking activities are operated very manually. In the warehouses, trained pickers are responsible for portioning and assembling the products according to the orders of customers. The order fulfillment activities are based on a "pull" supply chain process that allows

businesses to work in a just-in-time manner. The orders are delivered unattended, in well-insulated boxes that ensure the freshness of the products during long transit times. Similar to the New York-based company Blue Apron, which works with FedEx to deliver its orders, these e-grocers also work closely with a few different logistics service providers to deliver the orders to the destinations. These companies do not charge extra delivery fees, since the price of goods includes the costs of the last-mile service.
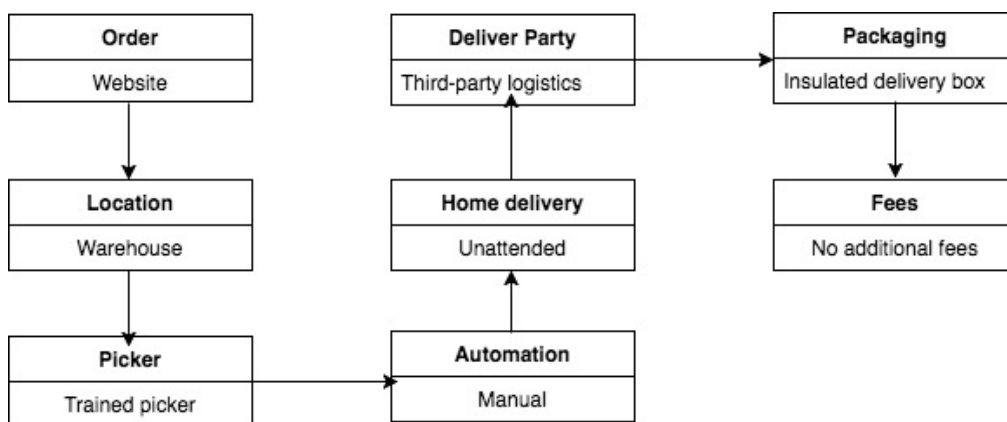

Figure 6. The Asset-light Dedicated Grocer Fulfillment Model

This fulfillment model is based on the customers' needs, and aims to maximize their experience. First of all, the customers of these online grocers are the most time-starved group that looks for an extensive level of convenience. As a result, they would much prefer an e-grocer who takes care of all the grocery decisions for them, even the meal planning and ordering. The customers pay a price that is little higher than average, in order to have the ready-to-cook meals at their door. As explained by the manager of Company B, their customers like home delivery more than a pickup service, because of the time they save. Also, their customers require higher-quality products. To meet this requirement, the companies have to source fresh products and apply a "just-in-time" supply chain process to extend their shelf lives.

In addition, these grocers have designed well-insulated boxes, and place ice packs in them to make sure the temperature remains low inside the packaging.

The order preparation is highly manual in this model, mainly because of the nature of the products. The portioning and assembling processes require a lot of dedication and human manipulations. It is impossible to achieve a high level of automation in these activities. The companies need to train their pickers very well to make sure that they handle the products properly, and work efficiently to meet the schedule.

Another feature of this model is that it fulfills the last-mile by collaborating logistics service providers. This choice makes a lot of sense with 1) investment; 2) risk; and 3) economies of scale (Rabinovich et al., 2007). First, the e-grocers do not have to invest in trucks and drivers. Second, the risk of losing or damaging the products is transferred to the carriers. Last but not least, this type of grocer offers their service nationally. However, as small start-up companies they do not have widespread networks nationally to reach all their customers, so using the service of logistics companies which can deliver to any location is the best last-mile solution.

5.1.2. Multi-channel Traditional Grocers

Many traditional grocery retailers in the Canadian market are seeking opportunities in the online grocery business, to compete with the new emerging companies and to adapt to the changing consumer patterns. These grocers usually have abundant experience in the grocery retailing business and well-established networks. As is shown in Figures 7 and 8, with this type of fulfillment model, customers can place orders on the company's official websites, or use applications on a phone or a tablet to browse products and place orders. The order preparation always takes place in stores, and is performed by trained personal shoppers. The picking activities involve a certain level of technology. The personal shoppers wear hand-held or hands-free scanners. These scanners help navigate the route, check the products, and monitor the performance of picking personal shoppers. Once the orders are

ready, they will be stored in plastic bags and placed in dedicated spaces attached to the stores, before being given to the customers.

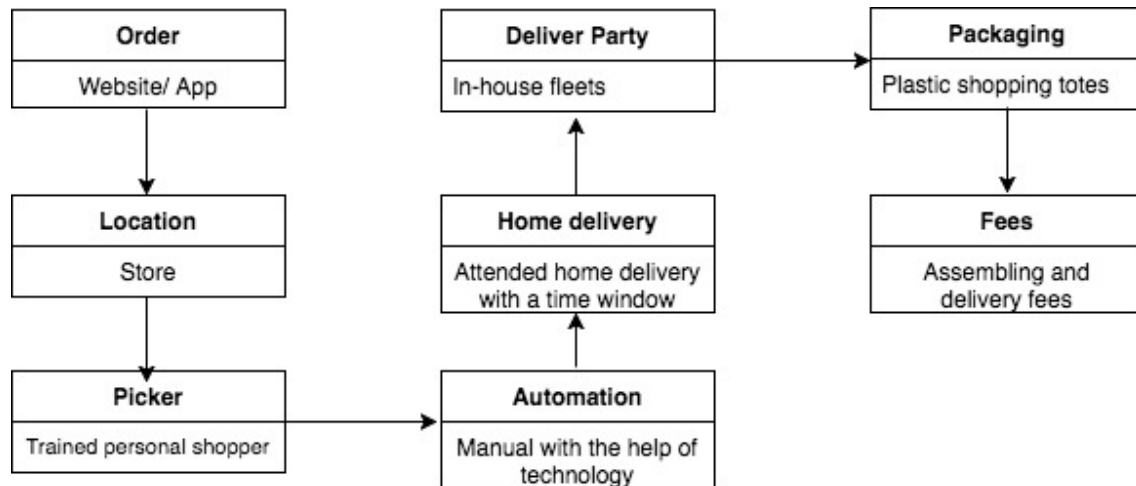**Figure 7. The Multi-channel Traditional Grocer Fulfillment Model with Home Delivery**
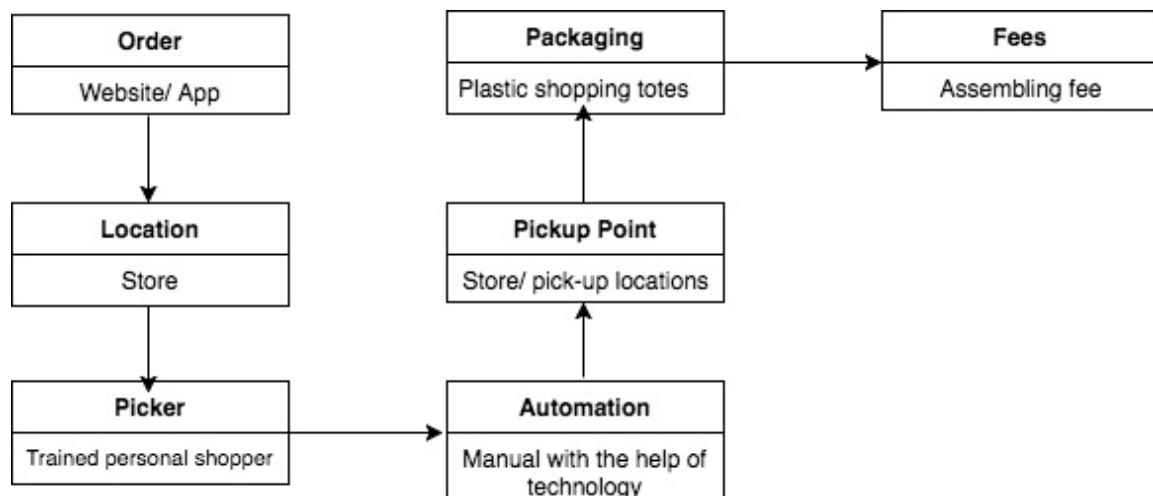

Figure 8. The Multi-channel Traditional Grocer Fulfillment Model with Pickup

Starting from the point of the last mile, the multi-channel traditional grocers do not always agree on the same strategy. Some of them provide home delivery, as described in Figure 7. In this scenario, the companies make investments in their

own fleets and drivers, in order to have good control over the last-mile process. The customers pay an assembling fee and a delivery fee to use the service. Some other grocers have chosen to offer only the store pickup service to customers (Figure 8). The customers can either pick up their orders inside the stores, or drive their cars to a specific parking area for the online groceries, and wait for the personal shoppers to come to load their cars with groceries. In this case, they only need to pay for the assembling fee. With some retailers such as Walmart, the customers can use this service for free.

The majority of multichannel Canadian online grocers have chosen to use the store-based fulfillment approach, to lower the costs of infrastructure and risks (Punakivi et al., 2001). There is Grocery Gateway, which fulfills orders from warehouses because it has reached a certain business volume. Since the online grocery is very new in Canada, there are still huge business volumes to be achieved in the new markets to have economies of scale. It is therefore not suitable to build additional warehouses right away. However, this does not mean that they will always use the store-based fulfillment strategy. Take the example of Grocery Gateway, which used to fulfill online customer orders from Longo's stores when the business was smaller. Later it switched to the warehouse fulfillment strategy, because of the increasing volumes which made it more efficient than picking at stores.

In this fulfillment model, the pickers are often called "personal shoppers". They are the professionals who perform the shopping activities instead of the customers themselves. These personal shoppers are the key to the quality of goods in customers' orders. They are well trained, so that they can select the best quality products from the shelves, as well as products with the freshest expiry dates. Also, they are required to pick the orders fast enough and to follow a schedule, so that the orders are ready for the customers when needed. By picking the best products and taking care of special requirements, the companies can have more of their offline customers going online, and also possibly gain new customers by word of mouth.

The companies in this category also invest in new facilities inside the stores to improve the efficiency of order preparation and the quality of products in customers' orders. First, as was mentioned before, the pickers use wearable scanners to help them find the products. The scanners also monitor the picking performance of each picker. The data collected by the scanners help to evaluate the efficiency and quality of the order preparation, and improve the performance later. The companies also invest in building multi-temperature storage areas inside the stores in order to keep the products at peek quality before the delivery or pickup.

The choices of the last-mile strategy are often led by costs, customer preference, and operational complexity. The most important element in this decision is the cost of delivery. Since the traditional grocery is a very low-margin business, the traditional grocers do not have much extra capital to invest in temperature-controlled fleets and full-time drivers. According to Company C, the delivery fees paid by customers cannot cover the additional costs of operating their own fleets, since there is not enough volume yet to even out the costs. However, some companies still choose to deliver to their customers, because they believe this is what the customers want. Also, online grocery customers usually buy bigger baskets than offline customers. Therefore it is still justified to deliver orders, even though the profits are thinner for each order.

Companies such as Loblaws serve the majority of their customers with the pickup last-mile method, because they believe the customers prefer this to the home delivery. The customers pay less to use the service, and do not have to wait at home for two hours. However, some customers still prefer home delivery, because they do not have a car or have mobility issues. Companies who only did pickups before are starting to provide home delivery as well. Walmart has started to deliver to some condos in Toronto where there is a high density. Loblaws also worked with Uber to give free rides to customers who come to pick up orders. In the future, the pickup models might gradually switch to a combination of both models, to catch up with consumer needs.

The choice of last-mile method determines the level of operational complexity. To expand the operations of online grocers to multiple stores takes a lot of managerial resources. To roll out and monitor the day-to-day activities, the e-commerce team needs to work with many different parties and employees. As a result, if there are in-house fleets and drivers to manage, the complexity of management can increase exponentially, and the service cannot expand easily. By contrast, if there is no last-mile process, the company saves a lot of energy and can bring the service to many stores in a short amount of time.

5.1.3. Last-mile Solution Provider

Between the two most popular types of fulfillment models, there are also a few companies that base their businesses on the last-mile and e-commerce void of many traditional retailers. These online grocers have their own websites and apps for customers to order products. The products are from major retailers such as Costco, Loblaw, and some alcohol stores, and are priced slightly higher than the retail prices. The companies also charge additional fees for delivery. As illustrated in Figure 9, after a customer places an order, the personal shopper will start shopping and communicating with the customer. The personal shopper does the juggling and shopping activities for the customers to help them save time and energy.
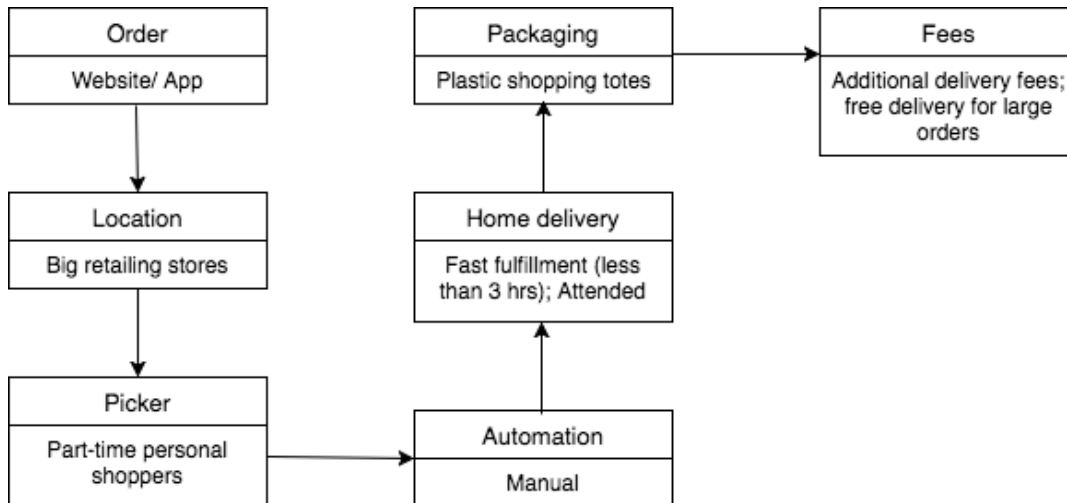
Figure 9. The Last-mile Solution Provider Fulfillment Model

This is a real-time and fast type of fulfillment service that is primarily based on the customers' needs and local networks. It is inspired by the idea of "uberization", namely that a platform consolidates the needs for fast grocery delivery and dispatches these needs to the external individuals who can offer the service. The customers want someone to buy the groceries for them, and have many personal preferences. Also, they want the groceries to be delivered as soon as possible. In addition, they appreciate the traceability in the fulfillment activities. The personal shoppers are not full-time employees of the online grocery companies, but instead people with cars who can do the grocery shopping for other people in the same area. As with Ubery, the customers are able to see the locations and movements of the drivers, and are informed when any change occurs.

The last-mile solution provider model is also the least costly to start and operate as an online grocery retailer. There is very limited investment in real estate, inventories, fleets, or employees. On the other hand, since the prices on the websites are higher, and there is a delivery fee that covers the delivery person's commission, this type of online grocer can earn a higher margin than many other types of grocers. Although easier on the capital side, this fulfillment model is more complex on the operational side. It is more challenging to monitor and control the fulfillment

quality, since it involves many external parties. Also, the companies promise very short fulfillment times to the customers. When the deadlines are not met, this results in a very negative customer experience.

5.1.4 Model Comparison

Canadian online grocers have adapted their fulfillment models to serve their customers and unique market conditions. Some of them have made very small modifications to the models from those of other markets. For example, the fulfillment models adopted by Canadian asset-light pure-play e-grocers are more or less same as those of e-grocers in the U.S. Because they all operate with "just-in-time" supply chains and rely highly on manually order preparation processes and logistics service providers for last-mile operations. The costs of working with logistics providers are higher in Canada. As a result, Canadian e-grocers of this type are more aggressive to expand their customer base to achieve economies of scales in the fulfillment process and last-mile operations.

However, the multi-channel traditional grocers have made lots of modifications to the global fulfillment models to make sure that they work well with the market conditions in Canada. For example, Canadian grocers are more conservative on providing home delivery services to their customers. Most Canadian e-grocers prefer store pick-up as a last-mile solution instead of home delivery. Companies like Wal-Mart Canada have gradually added the home delivery service to a few locations like downtown Toronto. Others like Loblaw avoids the home deliveries totally for the high costs and operational complexity come with this service. Also, the order preparations are very manually and majorly take place inside store.

In addition, there is absent in the appearance of large pure-play e-grocers like Ocado in the UK, who have invested heavily in automated fulfillment centers and who serve its customers by home deliveries only. This model works better in a market with high population density and large customer base, which is far from the reality of Canada. On the contrary, the last-mile provider model emerged in Canada

and expanded fast because of the last-mile voids created by many multi-channel traditional e-grocers who hesitate to provide home delivery services to their customers.

5.2 Current Challenges and Strategies

In this section, we analyze the most significant challenges for Canadian online grocers, and how they should develop their strategies accordingly. Canadian online grocers face many challenges from the emerging market and the nature of the online grocery business, as well as regarding customer satisfaction and fulfillment efficiency.

5.2.1 Profitability

Profitability is the major concern of almost all online grocers. The grocery industry is a very low-margin industry, and relies on high volume to make a profit. In traditional grocery businesses, the perishability of fresh produce, and the limited shelf lives of many products make fulfillment very expensive. In the US, supermarkets throw away 10% of perished or damaged products (Jacobs, 2017). No matter what business models the online grocers choose, they cannot avoid the problem of perishability. For example, in Company B, one delay from the third-party logistics company could cost them the value of a whole fleet of food. Also, the price points of online groceries cannot be much higher than the average retail prices, or customers would not use the service at all. As a result, it is harder to earn high profits in the online grocery business. To start an online grocery business, there are also expensive upfront investments in facilities, real estate, fleets, and employees. These investments delay the point of break even in many companies. The UK pure-play e-grocer Ocado finally reached break even after 15 years of operation, after investing heavily in highly automated fulfillment centers and technologies (Sahay, 2015).

In Canada, online grocers are also challenged by the reality of a smaller population and lower population density, compared to many other European and US markets. Because of the low density of orders over large geographic regions, delivery trucks need to drive longer routes to deliver fewer boxes in one trip. In addition, the climate makes it more challenging to deliver orders in winter (Government of Canada, 2017). Due to all these difficulties, the delivery cost per order goes up. When there are many customers in a small geographic area, it could make economic sense to invest heavily in an online grocery business. The costs can be spread over more customers, and can be covered by delivery fees or higher prices on products. However, it is more difficult to justify the high upfront investments when the population is much smaller.

There are several strategies that Canadian e-grocers apply to maximize their profits. First, companies such as Company A and Company B have introduced innovations in their fulfillment process to limit waste and, further, to limit the fulfillment costs. A grocery store wastes 10% of its inventory, because it uses a "push strategy", where it buys the products first, and sells them after. Online grocers who operate a "pull" supply chain do the reverse. They have the customers' orders first and do their purchases later. With this method, they can waste as little as 1% of all the food they purchase. The purchases are made in a just-in-time way, and are from local suppliers who can deliver the products as fast as within one day. In addition, this practice helps to minimize CO_2 emissions, and helps to grow the local economy.

Traditional grocers use different strategies to cut costs. First, fulfilling from stores instead of warehouses is the major penny saver for these online grocers. Traditional grocers have many more strengths over pure-play start-up companies, including the physical presence, the established distribution networks, the supplier relations, etc. According to Lee and Whang (2001), the best cost-saving decision is to use the already existing assets, instead of investing in facilities that will not be fully utilized. Most of the multi-channel online grocers have learned from the case of Tesco and other European e-grocers who have many years of experience in this field. Before

there were many online grocery orders, Tesco only fulfilled from the stores to save on costs. Canadian multi-channel grocers have chosen the store fulfillment model, since the Canadian online grocery market is still emerging. However, with the growth in business volumes, they might also switch to a dark store model or a warehouse fulfillment model.

Other than the two strategies discussed above, Canadian online grocers can also increase their profitability by charging assembling fees, delivery fees, pricing up products, and avoiding last-mile costs. Service-oriented companies such as Companies A and B price their products higher to earn higher margins. They also work with logistics carriers to realize the last-mile deliveries, instead of having in-house fleets. Traditional grocers usually charge additional fees for pickup and home delivery. However, these fees cannot cover the full amount of the costs of operating in-house logistics teams. They are actually earning smaller margins on the online orders. However, because online customers order in larger volumes, they drive up the total sales volume. The average basket size for a Canadian grocery shopper was 52 CAD in 2016 (Statista, 2016c). The figure for the same period in the online grocery sector is 72 CAD (Statista, 2016d). Some traditional grocers such as Loblaws and Walmart do not want to take the risk of a large investment versus low density in last-mile delivery, so they simply let their customers come to the store to pick up the orders.

5.2.2 Customer Loyalty

Another challenge in the online grocery business is that it is hard to win the customer's loyalty to shop regularly on the same websites. First of all, it is very difficult to convince many grocery customers to shop online. Fewer than 15% of Canadian online shopping customers said they had tried online grocery shopping (Abraham, 2016). They do not trust someone else to select their grocery products for them, and prefer to have the sensation of touching and smelling fresh produce

before buying. Once customers have tried the online grocery service, the decisive fact that influences their return rate is the experience. In the online grocery business, there is very little room for mistakes. Because groceries are both perishable goods and necessities, quality control and accuracy of delivery will directly influence the level of customer satisfaction. In addition, many people are not willing to pay extra fees to buy their groceries, since it is a basic living cost. They would rather go to several different grocery stores to find good prices. In a few cases, the customers find it is not convenient for them to pick up orders at stores, or to wait at home for two hours for orders to arrive.

The choices of fulfillment models impact greatly the customer experience in online grocery shopping for two reasons. First, the location to pick and to assemble the online orders is the major factor that decides the freshness and condition of the products. Orders picked in a distribution center are of better quality and accuracy compared to store-picked ones. Also, distribution centers usually have more complete assortment of goods than most supermarket stores. Frequent out of stocks can lead to negative customer experience, and eventually, the abundant of the service. Second, the choice of last-mile method is very import as well. By providing the home delivery service, e-grocers can provide extensive convenience for the customers and improve the customer experience.

Given all the uncertainties for online grocery business on the customer side, online grocery retailers have been working hard to attract customers, and to convince them to use the services repeatedly. Since Canadian customers are still alien to the idea of online grocery shopping, many online grocers give incentives to new customers to try the services. They either give large discounts on first orders, or give additional products to the customers. However, it is not efficient to retain customers by giving incentives. The experience plays a vital part in determining whether the customers will use the service again in the future. Customers who use this service expect high-quality products, and accuracy and punctuation in the last-mile service.

The traditional online grocers have hired new employees and trained them to pick the best quality products, and to follow special instructions from customers. The pickers are trained to pick a few specific categories of products, so that they are experts in picking tasks. The traditional grocers also work hard on quality, by placing the already picked products in multi-temperature-controlled storage areas. Also, for those who deliver their own orders, it is important to ensure product quality until the last step. They use temperature-controlled trucks to deliver the orders, to make sure the products are at desirable status when they arrive at the customers' homes. For those who offer only store pickups, similar practices are applied to preserve the products before the customers come to the stores. An advantage of traditional grocers over online grocers is that they have better control of the customer service aspect than the pure-play online grocers. They can give a similar kind of care to online customers as they would to store customers. Furthermore, the reverse logistics is more feasible for traditional grocers. When the customers come to the store to pick up the orders, they can return unwanted products and be refunded easily. In the case of home deliveries, the truck drivers would bring back the products if the customers return them.

Pure-play online grocers also apply their unique strategies to increase customer loyalty. Quality and freshness is a universal challenge for all online grocers. Since they are promising premium quality products and services, these pure-play grocers work hard to ensure maximized freshness from the beginning of the supply chain. They mainly source the products locally to have fresh produce and meat products with longer shelf lives. In addition, they try to keep the products in low-temperature environments as long as possible. In Company B, the production of recipe bags is done in a refrigerated environment. The recipe bags are only exposed to a higher room temperature for a short amount of time before they are placed inside insulated boxes. Also, like Company A, Company B, and Lufa Farms, many of these grocers operate on a subscription service model. Their customers agree to order the groceries regularly (usually each week). The subscribed customers can choose what

they want for the week, and customize their products. They also have the freedom to skip any order or to stop the subscription at any time. This practice attracts busy customers who are willing to outsource their meal decisions and grocery shopping for good. Compared to traditional grocers, these businesses have less control over the last-mile activities. When problems occur with the delivery or the quality of products, they often offer to reimburse customers or offer free boxes for the next delivery.

Price also has a large influence on customers' decisions to go online or not. The total price includes the price of the products and the additional fees to use the online grocery service. Customers are concerned that they will not get the same product discounts as they would in stores (Kim & Nielsen, 2005). For this reason, traditional grocers try to coordinate different channels to encourage their existing customers to go online. They offer the same prices online as they do in stores. Online customers have access to personal and store discounts, as offline customers do. Still, many customers do not like the idea of paying fees for assembly and delivery. Walmart recently canceled the assembly fee for the click-and-collect service. This will push other traditional grocers to reevaluate their strategies.

5.2.3 Fulfillment Efficiency

It is important to give customers exactly what they want in a timely fashion (Ricker & Kalakota, 1999). Efficient order fulfillment is critical to the success of the online grocery business. There is high pressure on the supply chain to fulfill orders on time. For now, the majority of online grocers in Canada apply manual fulfillment methods in their order preparation processes. Manual fulfillment limits the efficiency of the order preparation process. According to the case of Company C, a trained picker can pick around 100 items per hour. Compared to the picking efficiency in Ocado (300 items per hour), which is one third the speed. Also, by increasing the efficiency of picking, e-grocers are able to limit the costs of labor. Although automation can

greatly improve the efficiency of order preparation, it is not yet a feasible choice for many Canadian online grocers. The asset-light dedicated grocers have chosen manual fulfillment because of their business model. It is very hard for this type of grocer to be highly automated, since they rely on the human manipulation of bulk products, notably to assemble them into individual serving portions. The traditional grocers want to use their existing locations and facilities, and there is not enough volume yet to justify investment in automation or additional warehouses. As a result, Canadian grocers have to work with this situation, and to improve their operational efficiencies to meet the schedules.

The store fulfillment method that the traditional grocers use limits the picking efficiency. In a store, the layout is designed to have the customers exposed to as many products as possible, so that they will buy more. However, this layout is not optimized for picking efficiency (Treasure, 2017). Pickers need to walk longer routes and spend more time finding a product. In addition, the store-picking model can result in less freshness of products, lower accuracy, and a greater chance of having out of stocks (Bishop, 2016).

The pure-play dedicated grocers have designed well-defined fulfillment processes, in order to ensure high efficiency in the order preparations. For example, in Company B, there is a conveyer system that works like an assembly line in a factory. The production team is responsible for portioning and assembling the ingredients into a recipe bag. Then the shipping team will build the boxes, and add the recipe cards and ice packs. Then they put the meat on the ice packs, and place the recipe bags into the boxes. Before closing the boxes, the inspectors will check the quality of all the ingredients. Then these boxes are accumulated on a pallet and are ready to ship. Furthermore, they review their processes frequently to adapt to changes. Both Company A and Company B believe there is room for efficiency improvement in their fulfillment processes. With the growth in consumer demand, there will be more pressure for efficient fulfillment.

Traditional grocers try to achieve a certain level of automation in the store picking strategy to improve efficiency, accuracy, and information flow. The hand-held or hands-free devices are used in the stores for order preparation. These devices are connected with the store information system, and can have real-time information on the location and quantity of products available. For example, when a picker scans a product and places it in the bag, the quantity of that product is automatically deducted from the inventory. If the person has picked the wrong product, the scanner will also give warnings. Other than the functions mentioned above, these devices help finding the best routes, instruct on the right products to pick, and monitor the pickers' performance (Zebra Technologies, 2014). Regular evaluation of the pickers' performance can improve picking efficiency to as much as three times faster, as well as find potential problems. Increasing the picking efficiency results in fewer pickers needed inside a store, and therefore lowers the labor costs for the traditional grocers (Strauss, 2016).

Besides the technologies used in order picking, the traditional grocers also try to prepare orders during less crowded hours, to improve the fulfillment efficiency. When preparing the orders from a store during peak hours, the pickers could be slowed down by the store customers, which would decrease the picking efficiency. Pure-play e-grocer Lufa Farms starts to fulfill orders at midnight, and finishes around 8:00 am, so there is no traffic on the way to picking the products from many different suppliers, and all the orders are delivered to pick-up points on the same day they are prepared.

5.2.4 Last-mile Strategy

The choice of last-mile strategy has a large impact on the customer's willingness to shop for groceries online (Birse, 2015), and on fulfillment costs. The wrong choice could lead to the failure of the online grocery business (Al-nawaysheh et al., 2013). There are many different decisions to make regarding the last-mile operations. First, the online grocers need to choose between offering the service nationally or locally.

Second, they should decide on serving the customers with click-and-collect or home delivery. Lastly, they should consider operating the last-mile function in-house or outsource it to one or many third parties.

Pure-play dedicated grocers such as Company A and Company B both offer the home delivery service nationally. This last-mile choice has led to more new challenges for them. The cost of delivering boxes nationwide is higher than delivering locally. Since the boxes can only stay fresh for under 48 hours, they need to be delivered by plane to faraway places such as the east coast. Also, many locations have very small business volumes. The companies try not to refuse any customer at the start of the business, so that the number of customers keeps growing. However, it is impossible for these asset-light companies to own the whole infrastructure to deliver nationally. As a result, they work with carriers of different sizes and specialties to deliver to every customer. They use the services of smaller specialized grocers to deliver local orders. The local carriers mainly specialize in handling fresh food, and can provide better services to their customers. They also work with large carriers, which have logistics networks across Canada to reach customers in remote places. By outsourcing the last-mile logistics, the pure-play dedicated grocers can concentrate their resources and management on core business aspects. Also, compared to in-house logistics teams, the carriers take advantage of economies of scale and widespread networks.

For a good customer experience, it is crucial to integrate all the processes seamlessly along the supply chain (Hintlian et al., 2001). Working with carriers has brought many new challenges for pure-play online grocers. The major issue is that they lose a degree of control in the last-mile process. Online grocers require the carriers to deliver the boxes as soon as possible, and allow very little room for mistakes. However, most of the traditional carriers are not used to delivering perishable goods, so they do not understand very well the need for timeliness of the delivery and the NSR procedure in respect of unattended home delivery. Sometimes the drivers bring back the boxes if the customers are not at home, which leads to

delays in delivery. When there is a delay in delivery, it might result in direct loss of the product value and a very negative customer experience. To fix this flaw, the pure-play online grocers work closely with traditional carriers to make them understand the delivery requirements. Also, they try to consolidate the delivery volume to fewer carriers, in order to have better bargaining power and level of control.

Online grocers such as Lufa Farms only focus on the local market, and only offer pickups, to avoid huge last-mile costs and uncertainties in national deliveries. They have a few trucks to pick up the products from local bakeries and food stores. After the orders are assembled, they will be delivered to cafes, convenience stores, and some metro stations that serve as local pick-up points. By only offering pickups, this type of online grocer can plan the driving routes easily and economically, since the trips are more flexible and the orders are more consolidated than home deliveries. Also, since the pick-up points are not limited to certain stores, they can be located at many convenient places. This allows the customers to pick up their groceries conveniently on the way home or when buying a cup of coffee.

Traditional grocers have the choice between offering click-and-collect only, and click-and-collect and home delivery. Multi-channel e-grocers such as Company C have chosen to offer an all-around service, and have their own fleets for the last-mile tasks. This last-mile choice is both costly and challenging in terms of operations. In this situation, Company C decided to limit costs and simplify operations with two practices. First, it has simplified the distribution networks by consolidating orders. Although the company has many stores that can potentially serve as order preparation centers, the company has decided to consolidate the customer orders in only three stores. Second, it has outsourced the management tasks of the last-mile process to a contractor, who plans the routes for delivery and manages the drivers (who deliver orders in the trucks owned by Company C). This practice has helped the company simplify the tasks of the last mile, but it still has a good level of control over the process.

Some other traditional grocers are more conservative in terms of taking the risk for last-mile delivery. As the major grocery retailer in Canada, Loblaws is still hesitant to offer home deliveries to its customers. Similarly, Walmart offers store pickup, and only offers a pilot project home delivery to a few condo locations in downtown Toronto. This pick-up last-mile method has some advantages over the home delivery method in terms of costs, risks, and complexity (Colla & Lapoule, 2012). However, some customers who do not have cars or cannot go out for groceries still want home delivery. These traditional grocers face the possibility of losing a section of customers to their competitors who offer better services. As a result, they work on aspects other than home delivery to attract customers. Loblaws collaborated with Uber to offer free taxi trips to pick up online grocery orders. Walmart has recently removed the assembling fees for online grocery orders to encourage more use of the service.

5.2.5 Low Population Density

Finally, other than the challenges related to the online grocery industry, the low population density poses a great challenge on all the e-grocers regardless of their business model choices. It increases fulfillment cost per order dramatically because there are fewer customers to share the upfront investments, the operational, and home delivery costs. Also, since the customers are spread across larger geographic areas, it is complex to plan the routing for delivery in a time-efficient and cost-effective fashion. It requires the truck drivers to travel longer routes with LTL (less than truckload) items that drive up the costs and could lead to missing the delivery windows of the customers. In order to mitigate the negative effect of low population on profits and customer experience, Canadian e-grocers have adapted their strategies and leveraged their strengths to this market nature.

A common strategic choice among the traditional e-grocers is to provide only store pickup the home delivery service in small scale at the beginning of the business and to avoid huge investments in dedicated fulfillment centers (only assembling the orders in stores). Although many customers demand the home delivery grocery service, they can still drive to the store to pick up their orders that have already saved them the time and effort to do the shopping. Similarly, fulfilling the orders in stores is not the most optimal choice in terms of efficiency and product quality, but it is the key to keep the upfront investment low at the emerging stage of the online grocery business.

When there is a home delivery service, the e-grocers tend to work closely with logistics service providers to achieve economies of scales and extend the delivery network to reach more customers. In a market like Canada, It would be too expensive for e-grocers to operate trucks themselves just to deliver to a few households in remote regions. Meanwhile, it is still necessary to attract more consumers even they are very far, since the total population in Canada is small. As a result, the big logistics services companies are very essential to the success of online grocery business, especially for those who deliver nationally.

5.3 Future Trends and Challenges

Since the online grocery market is only emerging in Canada, there are many changes on the way. The most significant change will be the growth in the consumer base, because of the increasing acceptance of buying groceries online and the busy lifestyles people have. This growth will bring different challenges for e-grocers, depending on their business models. Second, with the growth in the online grocery market size, there will be more competition from domestic grocery companies and even foreign ones. Also, there can be entries from companies that were in other sectors. Lastly, the preferences of online grocery customers are constantly changing.

This requires online grocers to be flexible to changes and to adapt to new situations quickly.

5.3.1 Capacity and Growth

With the growing customer base, both the pure-play online grocers and the multi-channel traditional grocers experience pressure to increase their capacities, and improve their efficiency to better serve their customers.

Pure-play online grocers usually start with small operations, since the business volume is very small at the beginning. Company B's founders even fulfilled the orders from their own kitchen when the company was first created. During the years of operations, the business volume has continued to grow at a significant rate. Company B always faces a shortage of storage space, docks, refrigerated facilities, and employees. To solve the capacity problem, the company operates a just-in-time supply chain to limit the storage space needed. Recently, it also rented a new fulfillment center to expand the storage and working space. Company A experienced a similar situation, and has expanded the size of its fulfillment center, and also uses a just-in-time strategy. Another aspect of the capacity issue comes from the suppliers of these pure-play e-grocers. Most of these suppliers are small local farms, food retailers, or bakers. They will not be able to expand their production in a small amount of time to catch up with the rapid growth of the e-grocers. One of the solutions suggested by our interviewees is that they could keep more processes inside the fulfillment centers. For example, they could buy meat in bulk, and have production workers portion the meat, instead of buying packaged meat from suppliers. This will also make economic sense when there is enough volume.

For traditional grocers, the capacity issue is more complicated. The store picking fulfillment model limits efficiency in order preparation, and is prone to more errors. With a huge growth in the business volume, these online grocers need to rethink

their fulfillment models and processes. Since many Canadian traditional grocers learn from the cases of European online grocers, they might take a path similar to that of Tesco, which switched from fulfilling from stores to fulfilling from "dark stores", to achieve a balance of costs and efficiency. Although not many Canadian grocers have reached that point yet, the case of Grocery Gateway has given a hint for other traditional grocers. It fulfilled online customer orders from Longo's stores before 2012, and later switched to warehouse fulfillment when the business had grown sufficiently.

Contrary to online grocers who rely on infrastructure, the last-mile solution providers do not have to invest heavily to expand their capacities. For example, InstaBuggy recruits its personal shoppers online in different cities. Anyone with a car and time to spend delivering groceries to customers can be a potential personal shopper. Although there are some challenges in managing all the part-time personal shoppers and the service quality, they still have an advantage in terms of expansion.

5.3.2 Competition

When the Canadian online grocery market started to emerge, many companies joined the industry. The barriers to entry are low, and it is critical to have first-mover advantage and to accumulate experience in this field before moving to online grocery retailing (Keh & Sheih, 2001). Amazon launched its online grocery shopping in Canada in 2013, and has challenged the Canadian grocers to get ready for the online grocery game. Loblaws launched its online grocery service in 2014, followed by Walmart in 2015. Also, many people who were initially in other sectors with no experience in grocery retailing have also joined the competition. Competition from outside the grocery industry and outside the country has shaken up the Canadian grocery industry, and has prompted changes in the business models of traditional grocers.

Almost all online grocers are carefully watching the moves of Amazon.com. The online retail giant initially introduced its online grocery to Canada in 2013, offering 15,000 kinds of non-perishable food products (CBC News, 2013). Recently, Amazon has acquired the food chain Whole Foods, which has 13 stores in Canada and more than 400 stores in the US (Whole Foods, 2017). However, Whole Foods' plan is eventually to expand to 40 stores in Canada (Healing, 2017). Strategically, the grocery chain can potentially serve as the starting point to expand the online grocery business in Canada, and give Amazon access to grocery suppliers all across North America.

In the short term, Canadian grocers do not worry too much about Amazon (Tencer, 2017). There are many obstacles to entering the Canadian grocery market. The pure-play online grocers are actually welcoming the idea of Amazon entering the online grocery market in Canada. Amazon might bring synergies and drive down the costs of fulfillment for small-and-medium-sized online grocers. Also, customers will be encouraged to buy more groceries online, which will bring more business to pure-play grocery retailers. However, in the long term, Canadian e-grocers are still cautious about Amazon's entry. The interviewee from Company B explained that if Amazon acquires companies such as Blue Apron, and bring them to Canada, it could be a threat to all the companies who deliver meal kits to their customers. Furthermore, Amazon's entrance to the grocery sector could give it frequent access to customers' doorsteps, because people buy groceries multiple times a week. Eventually, people will buy other products from Amazon, instead of from other retailers for the convenience and low prices. Walmart started its grocery pickup service in Ottawa in 2015, and now operates the service in GTA, Ottawa, Edmonton, and Calgary (The Canadian Press, 2017). After Amazon's acquisition of Whole Food, Walmart has recently removed its assembling fees to use the online grocery service. This decision is going to put pressure on other traditional grocers to offer better value in online grocery shopping, and make the margins even thinner.

Both Amazon and Walmart attract consumers with low prices. The Canadian online grocers believe that they can compete with these two foreign retail giants with their high-quality services, loyalty programs and understanding of the customers. For instance, the average lead time of an online grocery order from Amazon is three to four days, and it does not offer perishable products yet. The traditional grocers can fulfill orders as fast as the next day. Also, last-mile solution providers offer real-time grocery fulfillment that can be delivered within three hours. Loyalty programs are another factor that Canadian traditional grocers work on to compete with foreign players. This kind of program integrates the online channel with offline stores in which members can use their personal rewards, and enjoy discounts in both channels. The online experience is highly similar to the offline experience, which makes it easier for the existing store customers to try the online service as well. Also, understanding the Canadian customers is important in winning the online grocery shopping battle. For instance, the interviewee from Company A said that, even inside Canada, customers have many differences in meal preferences. When the company develops a recipe, it has to make sure it pleases a majority of the customers across the whole country.

In addition to competition from outside, traditional grocers also face the challenges of "cannibalization", where their online businesses compete with their own stores. However, the Canadian traditional grocers believe they do not have many concerns with this aspect. The CEO of Grocery Gateway said their online customers are not the same as their store customers. The company is fulfilling different needs of the market in different channels (Herald, 2017). Similarly, Company C believes that new business is gained in the online channel, and customers buy more online than offline. In addition, if the traditional grocers do not offer their customers the online choice, their competitors will. It is better to lose store sales to the companies' own online channels than to the competitors.

5.3.3 Changing Consumer Patterns

Consumers are constantly demanding changes and innovations in online grocery services. For pure-players, it is critical to build business models around the needs of customers. Their business models should alter frequently with growth and consumers' requirements. For example, Company A discovered that its customers have the need to eat a variety of healthy snacks at work, so it started to deliver snack boxes in addition to the meal kit service. This service helps the company win more market share in the online food sector, and increases the customer experience. Lufa Farms offers after-hour deliveries with their electric cars, because some customers are demanding home deliveries but still want to have less impact on the environment (Kucharsky, 2017).

Although the major part of the grocery business is still offline, traditional grocers have to find ways to adapt to new market needs and competition, and retain existing customers. With the Millennials gradually growing in purchasing power, traditional companies have been working on methods to attract younger generations, while avoiding too many changes that could confuse other consumers. Company B has integrated all of its services with the online grocery platform. It keeps the old-fashioned paper coupons and rewards, but offers the choice of using them in digital form as well. In this way, customers of different age groups and lifestyles can all use its services conveniently. Traditional grocers have improved their online user interfaces to make the service more accessible. Grocery Gateway has recently updated their official website, because it was difficult to see the products and necessary information. The new website is more user-friendly, and has a more attractive appearance that is appealing to customers.

5.4 Online Grocery Fulfillment Models and Challenges for Canadian Grocers

Based on the detailed analysis of four major online grocers and other less emphasized grocers, we were able to identify the three most common order fulfillment models. First, the asset-light pure-play dedicated grocer model is widely

adopted among small-to-medium-sized start-up companies. It does not require much upfront investment and operational costs, since there is no investment in brick-and-mortar stores or last-mile infrastructure. The e-grocers who use this fulfillment model often adopt a just-in-time supply chain strategy to limit waste and save on storage capacities. Another fulfillment model is the multi-channel traditional grocer model. This model is commonly used by traditional Canadian grocers who seek changes in their business strategies to adapt to the new realities of the grocery retailing business. They focus on maximizing the usage of existing stores and other assets, lowering risks and investment, and having good control over the whole fulfillment process. Lastly, we discussed a unique fulfillment model, the last-mile solution providers. This fulfillment model is based on the market void in terms of fast last-mile grocery delivery service in Canada. The companies which apply this fulfillment model are technology driven and have very limited infrastructure. They have their part-time personal shoppers fulfilling orders in major grocery retailers, and deliver orders to customers in a real-time fashion. The service, traceability, and low costs work well with the start-up nature of these grocers.

Canadian online grocers share some common challenges in terms of the market nature and logistics industry. Meanwhile, because of their different choices of business and fulfillment models, they also have their unique challenges. First, all Canadian grocers need to find ways to achieve profitability in the thin-margin grocery industry. Also, they work hard on growing their customer bases, and increasing repeated purchases to overcome the challenge of customer loyalty. Both the pure-play dedicated grocers who fulfill orders from the warehouse, and traditional grocers who fulfill orders from stores, have to face the challenge of low fulfillment efficiency. The former can use a conveyor system and well-defined processes to improve the efficiency of picking and packing, while the latter can improve their efficiency by using technologies such as hands-free scanners to assist the pickers in the order preparations. Canadian online grocers also need to choose one or more last-mile solutions to meet customer needs, while keeping costs low.

Pure-play online grocers work with third-party carriers to deliver orders. This solution enables them to deliver to any customer in Canada with reasonable costs. Traditional grocers have taken diverse paths in last-mile strategies. Some of them only offer store pickups to avoid the related risks and costs. Others have decided to invest in their own fleets, and work with third-party drivers to provide extensive convenience to the customers.

On top of the current issues, Canadian grocers face other future challenges, such as limited capacity and potential competition both from national companies and foreign competitors. With the fast growth in consumer demand, e-grocers with different business models have to find ways to improve their capacity and efficiency of fulfillment. They need to be flexible to adapt to new market needs as well. Walmart has always been a strong competitor in terms of price and convenience. Amazon, the online retail giant, entered the online grocery sector a decade ago. Its recent acquisition of Whole Foods has shaken up the grocery industry. The high-end grocers could serve as the brick-and-mortar starting point of Amazon's online grocery business, and attract more store customers to the Amazon Prime membership program. However, in the short term, Canadian online grocers do not feel the treat from Amazon. There are many obstacles to entering the Canadian online grocery market, including the logistics costs and customer preferences. They believe that they can provide better services, and understand the needs of Canadian consumers. Their strategy is to work on their competitive advantages as local companies with more market experience.

6. Conclusions

This study has looked into the dynamics of the newly emerged Canadian online grocery market. Since the market is rather new, it does not yet have many companies and a proven successful business model. Furthermore, not many studies have been done on the Canadian online grocery industry, so there is very small number of academic references in this market. As a result, we have carried out an exploratory case study research by discussing fulfillment strategies with existing online grocers in Canada, and investigating the data from many secondary sources, aiming to find the answers to the following research questions:

- **How do Canadian online grocery retailers fulfill their customer orders?**
    - o What are the fulfillment models used by Canadian online grocery retailers?
    - o What are the reasons for such fulfillment choices, as mentioned above?

- **How do Canadian online grocery retailers face their present and future challenges in their e-fulfillment process?**
    - o What are the present and future challenges in the online grocery industry in Canada?
    - o How do Canadian online grocery retailers overcome these challenges in different situations?

The first main research question is well answered by the models we presented in the analysis section. The three most popular fulfillment models in Canada are: 1) The pure-play asset-light online grocer; 2) the multi-channel traditional grocer; and 3) the last-mile solution provider. Other than these three, there are also other models that are used less frequently by Canadian online grocers. The choice of fulfillment model is based on many factors: Upfront investments, operational costs, customer satisfaction, business nature, operational complexity, etc.

The second main research question is more complicated. All Canadian online grocers share some common challenges, and face unique challenges from their business models. According to Alvarez and Marsal (2016), the ideal fulfillment model is one that integrates customer satisfaction, flexibility of growth, implementation of technology, operational performance, and cost efficiency.

Our results indicate that the primary concern is profitability, since the grocery business naturally has very low profit margins. Online grocers then try to limit their costs by using existing assets, outsourcing a part of their operations, and increasing their sales volumes. On the other hand, they have to meet the high expectations of customers, both in terms of product quality and service quality. Most Canadian grocers have invested in temperature-controlled facilities, and technologies to maintain the freshness of perishable goods. Pure-play online grocers provide convenient home delivery and meal planning services to maximize the customer experience, while the traditional grocers provide similar services and promotions online as those offered in-store in "click-and-collect" or home delivery models.

Since logistics costs are higher in Canada than in other markets and the customer group is smaller, most Canadian online grocers minimize risks by investing less in infrastructure at the beginning. However, with the growth in their business volumes, they will need to expand their capacity and will have to make changes in the fulfillment process. Moreover, with the growth in business volumes, Canadian grocers will face competition from each other and foreign entries such as Amazon.com. They need to find their competitive advantages as experienced grocers and native companies over foreign players such as Walmart and Amazon, which compete with their low prices and logistics competencies.

6.1 Theoretical Implications

This research has explored the fulfillment strategies of Canadian online grocers, and the challenges of the Canadian market. There is hardly any academic work focusing on this

topic, since the online grocery business only started to emerge recently and there are not yet many players in the market. Our research has provided a holistic view of four representative cases, and of the current and future market dynamics. In addition to an understanding of the Canadian market and e-grocers, we have also identified the most updated business practices and strategies in the online grocery sector. There have not been many new research efforts on the online grocery industry globally in the past decade, but there have been many dramatic changes taking place in the industry that we found necessary to investigate into.

6.2 Managerial Implications

The Canadian online grocery market is very new, and has special characteristics that should be taken into consideration when making strategic and tactical decisions. Managers in this sector can learn from online grocers in Europe and the US, since they have more years of experience in these operations. However, the decisions should be based on the reality of a riskier business environment and higher logistics costs. Each company should also identify their unique challenges and customer preferences. Cost-effectiveness and customer satisfaction are the key factors of success in the Canadian online grocery business. Managers need to limit the costs of order preparations and last-mile processes, and to improve the efficiency and accuracy of these processes. When designing fulfillment strategies, companies have to base their decisions on their unique business nature and customer groups. The last-mile choices should be made considering a good trade-off between costs and consumer convenience. Lastly, since the online grocery market is still in its emerging stage, and there will be many changes both in terms of consumer preferences and the competitive environment, Canadian online grocers need to reevaluate their strategies and processes frequently to adapt to these changes.

6.3 Limitations and Future Research

There are several limitations to this research due to different reasons. First, we were not able to find many academic works on the Canadian online grocery market. As a result, our literature review is mainly based on research conducted in other markets such as Europe and the US. Also, there are not many recent papers that we could refer to when designing our research. Second, we have studied the cases of four Canadian online grocers. With this limited number and variety of cases, we are not able to achieve a significant level of generalization in the conclusions. These four cases do not represent all the business models of Canadian online grocers. In Figure 5: The Fulfillment Choices of Canadian E-grocers, we did not consider the assortments of goods as a dimension to categorize the e-grocery fulfillment models. Adding this variable could help to identify the characteristics and the performances of the e-grocers more precisely.

Also, the online grocery business is very new in Canada, there are few companies to choose from, and not all of them were able to participate in the research. We finally narrowed down the size to four cases that have enough information available and can lead to answers to the research questions. As the Canadian online grocery market grows, future researchers will have more choices in the samples, and can increase the generalizability of their results. Third, because of the limited time span of the research, we only interviewed one person from each of the interviewed companies. Thus, the data we have collected is limited, and the results could be biased because of the personal interpretation of the interviewer. The quality of interpretation could be improved if there were more than one researcher to conduct the interviews.

Furthermore, we were not able to observe changes and performance from fulfillment strategies over a long period of time. Future researchers could conduct longitudinal research to follow the development of these cases over time, and interview multiple persons in each of the organizations. These practices would yield

more profound and accurate results. After years of operations in this business, the e-grocers could accumulate abundant data on the consuming patterns. Thus, researchers can also investigate how e-grocers leverage the data to make decisions on personalization and product assortments. Lastly, we have only studied the cases of Canadian companies. Future research can also look into the strategies of multinational online grocers who want to expand their businesses to the Canadian market. The foreign entries have different advantages and obstacles compared to Canadian online grocers. The findings could contribute to a more profound understanding of the Canadian online grocery market.

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Appendix

Appendix.1 A Summary of Five Fulfillment Strategies
Source: Ricker and Kalakota, (1999)

Type of Fulfillment Strategy	Distinctive Characteristics	Major Strengths	Potential Weakness	Management Challenges
Distributed delivery centers	Distributed operation sites; Self operated.	Easy start-up; Prompt delivery; Operation in control.	Complex inventory management; High inventory costs; Unfamiliar with warehousing procedures.	Establishing sophisticated inventory-management system; JIT inventory management.
Partner fulfillment operations	Distributed operation sites; Partner operated.	Minimized up-front investment; Less operational responsibility; Flexible delivery arrangement; Low shipping charge to customers.	Service limited by partnership; Low overall efficiency; High inventory costs and inventory-management complexity.	Establishing order-routing system; Maintaining strategic alliance with partners; Ensuring service quality and reliability.
Dedicated fulfillment centers	Centralized operation site; Self operated.	Avoids the higher inventory costs; Easy to manage; Fast delivery; Reduced long-term costs of operation.	High up-front investment; Decreased flexibility.	Converting traditional warehousing to consumer-direct fulfillment; JIT inventory management.
Third-party fulfillment centers (3PFs)	Centralized operation site; Third party operated.	Least investment; No learning curve; No operational complexity; Limited changes to legacy systems; Minimized operational impacts.	Few options available; Risks in strategic alliances; High operational charge.	Selecting the third party; Establishing inter-organizational information systems with the 3PF.
Build-to-order	Spans both centralized and distributed operations.	Minimum inventory; "Pulling" ensured; No stock inventory; Controlled fulfillment.	Over-customization; Costs and resources of integration.	Synchronizing entire flow of materials vs. managing inventory; Altering material flow upstream vs. customer demand downstream.

Appendix 2. Advantages and Disadvantages of Fulfillment Models
Source: Hübner et al. (2016)

	Picking of online orders		
	In-store	**Separate fulfilment center**	**Central warehouse**
Advantages	Offering full offline product range within existing structures; enables rapid expansion without investing in new logistics facilities; less costly to install processes for order to customers; storeshortest transport distancepicking; usuallyonlineparticipation in online sales	No interaction between pickers and shoppers instore; designed for online picking, therefore easier to scale-up for larger volumes; easier to keep track of inventory transparency; lower transportation distance to customer, also allowing for higher time accuracy	No interaction between pickers and shoppers in-store; flexible capacity management across channels and lower investment costs when part of bricks-and-mortar structure; lower picking costs with higher order volume; postponement of inventory allocation; synergies via joint delivery from supplier
Disadvantages	Additional logistics and replenishment for online volume to store; store space restrictions limit efulfilment; store layout is designed for displaying products; hard to keep track of inventory transparency; picking with customer interaction and conflicting inventory allocation rights in case of shortages	High fixed cost for setting up fulfilment centre; no integrated inventory and capacity management across channels; additional inbound transport and handling costs either from supplier or central warehouse	Longer average distances to customer; adjustment of picking system required for integration

	Delivery models				
	Home delivery		**Click-and-Collect**		
	Attended	**Unattended**	**In-store**	**Attached**	**Solitary**
Advantages	Possibility of directly interacting with customer	Elimination of tight time slots, capacity problems and redelivery costs; shorter working hours	Possibility of crossselling at pick-up; low investment	Opportunity for drive-through solution; possibility of cross-selling in attached store; flexible inventory allocation with attached store	Opportunity for drive-through solution; easier entry in new markets with no shops so far; simplified demand planning and inventory control through own inventory
Disadvantages	Complex and costly vehicle routing; need to dynamically assign time slots; additional storage and delivery expenses if customer is not present	No direct customer interaction; temperature requirements and theft at reception point; initial investment for boxes necessary	Difficult to scale-up due to limited store space	Larger investment to set up additional facility	High investment to set up solitary pick-up station; no integration or synergies with store

Appendix 3. Home Delivery Fulfillment Models in UK Grocery
Source: Alvarez and Marsal (2016)

Models		Traditional	Dark Store	Centralized Model
Fulfillment decisions	**Order**	Online	Online	Online
	Picking	In-store picking	Dark store picking	Centralized automated picking
	Delivery	Van delivery from store	Van delivery from dark store	Van delivery from centralized DC
	Return	Return to store	Return to dark store	Return to centralized DC
Strength		Low investment and quick to establish — suitable for retailers waiting to see if online will be popular	• Congested aisles in the existing stores are reduced • Dark stores are arranged internally to copy store layout making familiar picking operation for staff • Easier returns process as stock may be put back onto shelves (where permissible)	Low picking cost per order due to high level of automation
Weakness		• Highly inefficient pick rate — typically between 5 – 10 orders per shift per person • Congestion of aisles in-store with order pickers • Range dilution / confusion in store and blurring of store performance • Returns are typically written off as they cannot be returned to store shelf position	• Dark stores are arranged internally to copy store layout making them inefficient pick operations • Current dark stores are only adjacent to densely populated areas — others revert to model A • Staffs are 'walking the store' with shopping tote trolleys and may travel miles per day per person • Replenishment occurs as for a traditional store making picking difficult and potentially requiring additional shifts	• Centralised picking in a geography as large as the UK pushes up delivery cost Stem mileages to and from the centralised depots are large making delivery very expensive • Cross docking food orders (where practiced) to maximise volume in primary transport is expensive • Multiple handling of picked orders is expensive • Sophisticated automation is expensive to implement, maintain and replicate with market growth • Returns impossible to manage in a cost effective and food safety conscious way

Appendix 4. The Semi-structured Interview Guide

1. What is the reality of online grocery business here in Canada? What are the special characteristics of the Canadian online grocery market and customers?

2. Who are your online grocery customers? What do they expect from this service?

3. Please describe the fulfillment process of your online customer orders. Why do you choose this fulfillment strategy? Why have you not chosen some other strategies?

4. What are the biggest challenges in the fulfillment process? How do you overcome these challenges?

5. How might these challenges change in the future? How are you going to adjust your fulfillment strategies?

6. How do you pick and prepare an order? Where does it take place and who does the job?

7. How do you deliver your orders? (If delivery applies.) Are you using third-party services?

8. What are the costs of fulfillment? Do you think the costs are high? What are the reasons?

9. What is the profitability of online orders? Compare the profitability to the traditional grocery business.

10. What do your customers think about the service? How is the customer experience level?

11. What changes will you make from the current state, and why?

12. What trends do you foresee in the online grocery business in Canada and the world?