



The Impact of the COVID-19 Pandemic on Online Grocery Supply Chain Management: A Case Study in Istanbul

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Highlights

- This manuscript studies online grocery supply chain management during COVID-19 in Istanbul.
- A survey was conducted to understand customer grocery online shopping attitudes in COVID-19.
- Some managerial implications are recommended as the results of the SWOT analysis.

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Abstract

The COVID-19 pandemic has already crippled normal life all over the world. Its negative impact not only changed the human health system tragically but also disrupted the global economic system. One negative result was ended up in the global food supply chain. As the lockdown times have suspended the manufacturing and logistic activities, therefore, the customers have experienced unimaginable chaos in the shopping markets. Moreover, the purchasing habit of the consumers has remarkably changed compared to pre-pandemic. To meet this new demand pattern, many grocery retailers have tried to adapt to the new normal. While before COVID-19 offline grocery purchasing was popular, after the pandemic, online service got tremendous attention in market. In this study, online grocery supply chain management during the COVID-19 in Istanbul is considered. The aim is to find out how online grocery companies will serve more efficiently during the pandemics and which factors have more effect on the customer's satisfaction. To do so, first, three popular grocery retailers in Istanbul were selected. Then, a related survey was designed to understand the consumer experience as doing online grocery shopping in COVID-19. Unsurprisingly, a result shows that 60% of the respondents did online shopping every 3-4 days in one week, and the delivery time is the most important factor for the customers. Then, the SWOT analyses were performed accordingly, and the related strategies were summarized. Finally, several managerial implications were given to may improve the company's online services in COVID-19 and post COVID-19 in Turkey.

1. INTRODUCTION

The new Coronavirus was detected firstly in December 2019 in Wuhan, China. Consequently, the virus spread was declared as the pandemic by the World Health Organization in March and many countries, as well as Turkey, announced officially the pandemic conduction [1]. Then, several restrictions have been imposed by the countries to control the pandemic. Thereby many borders between countries have been closed, many workplaces moved from offices to homes, and online education has been an imperative system. At the same time, many companies and business firms faced an unpredicted crisis, and could not run their businesses. Clearly, a negative consequence of lockdown and travelling restrictions was on the global supply chain, especially, the food supply chain. Since the food supply chain includes many local and international levels, it was erupted severely by the pandemic.

While most industries were impacted by COVID-19 over the world, many food suppliers and manufacturers have tried to deal with new normal to keep the customer responsiveness as in the past level. Therefore, a resilient food supply chain management was crucial in this time. On the other side, during COVID-19 and

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because of the restrictions and staying at home, there was a remarkable increase in the demand for the grocery market. Therefore, by this new demand pattern, the supermarkets have persuaded to provide the online markets and online delivery services [2]. Because of this intention in online shopping, all level of food supply chains needed some update systems and adoption to new framework. However, that statistics showed that the online grocery sale was relatively successful to meet the demand in the pandemic time. Globally, online grocery sales were grown 22% in 2019, however, this growth was incredible through the pandemic [3]. According to the [4], COVID-19 has not only accelerated the conversion of new online shoppers but has also convinced a large majority to continue purchasing online. Such satisfaction on online shopping has tempted many industries to start their own online services as early as possible. Therefore, during the pandemic, the online delivery trend could be called as Godfather in grocery and food supply chains.

Turkey, as a country with a remarkable population has also been affected by the pandemic, and the limitations such as travel restrictions, lockdowns, and social distancing were applied in the entire country. Before the pandemic, not many convenience stores were active in the online delivery market, and for those were active mostly gave services in big cities like Istanbul, Ankara, and Izmir. Moreover, their servicing levels were relatively limited and not known mainly for the customers. Typically, in Turkey, people prefer to go to the local markets physically and purchase fresh and low-cost items. It means that intention to online shopping was not a lot comparing to before COVID-19. However, as lockdown was announced in Turkey, the online delivery grocery retailers have faced a surprisingly increase in their demands. As a result of the enormous number of orders, the companies competed mostly by presenting the high qualified grocery items, faster delivery, unexpansive items, and introducing the user-friendly apps. However, during the pandemic, the retailers faced several unexpected challenges like not sufficient warehouses, more experienced workforce and carriers and marketing on new services. Along with the old services, several new methods were added to the online services such as the contactless delivery and QR code menus.

In light of the discussed challenges of grocery retailers during the pandemic, the studies which address both strategical implications and theoretical analyses should be more in the literature. To the best of our knowledge, there does not exist any related study which discusses the online grocery supply chain management as a case study in Turkey in the literature. Therefore, a comprehensive study which represents the main questions related to online grocery sales and customer satisfaction factors, in case of Turkish companies, seems is missing in the literature and should be investigated.

The aim of this study is, firstly, to identify the challenges in front of online grocery delivery companies in Istanbul as COVID-19 was started, and then to provide several strategical and managerial implications based on a survey which was designed and conducted to the participants who lived in Istanbul in COVID-19. From a managerial perspective, to know which factors are prior for the customers might help the retailers improve their future services and develop new business models and infrastructures.

To do so, three popular and big grocery retailers which did home delivery services in Istanbul are considered. The grocery retailers in this study, without regard to order, are Getir, Migros and A.101. Main reason to select these companies was that they address different types of consumer segments in Istanbul, and it definitely affects the survey on a positive and unbiased way. This study is organized as follows: after a brief literature review on the food supply chain through the pandemic, the grocery supply chain will be discussed. Then the conducted survey will be presented and according to the survey results, the SWOT analysis matrices for all companies will be built up. Following that, some strategical and managerial implications will be discussed in detail to assist the retailers to maximize the efficiencies and responsibilities. Finally, the conclusion part will summarize the study.

2. LITERATURE REVIEW

The COVID-19 and its forthcoming consequences had direct and indirect impacts on the food supply chain, in particular the retail suppliers all over the world as well as in Turkey.

Many studies have discussed both the predictable and unpredictable global challenges on food supply chain by emerging COVID-19 pandemic. Particularly, the studies with an agri-supply perspective have been popular in the literature as they discussed the main global questions in this field. For example, [5] proposed that the governments should assist the small farmers and have some dynamic plans to tighten or loose food supply during the pandemics like COVID-19. In further detail, their findings showed that a flexible supply chain is a good response to these types of challenges. Resilience in agri-food supply chain due to the volatility of pandemic period is also a crucial topic. To have a resilient food supply chain, through the pandemics, a reliable and trustful relation between supply chain partners is critical. For example, as discussed in [6], a policy in Canada as an agri-food exporter to keep the resilience of food supply chain was to ensure a new, reformed, and sanitized with the minimal human interaction-based supply chain.

In addition to the studies which considered the resilience in food supply chain, the safety of the food supply chain also received significant attention in the literature. As an example, [7] studied the safety of the environment to control the spread of COVID-19 through all levels of the food supply chain. So, the impact of COVID-19 was examined throughout all levels of the supply chain with respect to different sectors. Further, a new simulation model of the public distribution system (PDS) network has been proposed by [8] with three various scenarios to understand how chaos can influence the food supply chain sector especially the logistics and transportation levels. These scenarios, in fact, compared the different states of PDS under the normal, lockdown and backup facility based on a real-life case data from north India. The result of simulation showed that a model based on a mixed warehouses can be a solution for the exceptional conditions like lockdown and travel restrictions. This study also argued the importance of a resilient supply chain- from food to healthcare- during a global outbreak. And their proposed simulation model can help to achieve this purpose by supporting a decision-making system for reallocating the routes and vehicles when a new travel restriction is announced. Further [9] considered the food insecurity in crises like the pandemic in India. In a more general term, the study talks over some free of charge steps to preclude deaths of people, especially women and children, because of the pandemic and the deaths related to food insecurity for the immediate, medium, and long terms in India. To reach the purpose, the study suggested some governmental and non-governmental strategies to solve the food insecurity problem in India.

There are several studies which investigated the general food supply chain challenges in both COVID-19 and post COVID-19. For example, [10] identified the local and regional food systems to the local food supply chains to control the unstable demand and policy changes during the pandemic. They described the reasons behind the question of why local food markets were more sensible to respond to the pandemic changing than the national and international markets. Moreover, [11] addressed the food supply chain management post COVID-19 and how the human and business perspective will be affected accordingly. Their discussions stated that the future food supply chain to overcome the same difficulties as happened over the COVID-19 period needs unprecedented safety, technology, and policy measures.

While the contribution of the studies with the food supply chain in COVID-19 perspective to the literature is significant, the most related direction to our study is the studies with focus more on the online food supply chain in the pandemic. These studies refer to online food purchasing attitude during the pandemic and how the customers have evaluated the food delivery companies. As an instance, [12] investigated the customers' complaints with respect to online food delivery companies which have provide the online services in Turkey during COVID-19. Based on the study, all complaints of the customers were recorded in a web. Page and the data to analysis were obtained from there. Their findings show that the most complaints were related to the delivery and communication gaps. In light with the findings [12], [13] also considered the online food companies in India and the USA to evaluate their performances during the COVID-19 by applying a machine learning approach. They derived out some factors such as delivery operations, social responsibility, and financial. And they reported that these factors have the most impact on customer expectations both in India and America. Furthermore, an interesting finding was that Indian consumers are more intent to the social responsibility of the companies, while for American consumers, the financial dimensions are crucial. In another case study which was conducted in the USA, [14] analyzed the customer reviews on the Uber Eats food delivery app (FDA). The finding showed that the service quality dimension with a relatively high rate is the most important parameter for the customers and following it, the FDA's performance dimension and the product quality dimension were the least important ones.

Several studies also discussed the importance of customer satisfaction and, more precisely, the changing in grocery shopping pattern as COVID-19 was started. According to the [15], the manufacturing processes of grocery products have dipped remarkably in both France and Germany after the pandemic in March 2020. More specifically, in France, the rate of food production dropped 2.3% compared to the one month ago data. The same situation was observed in Germany, where a -4.1% reduction was recorded in manufacturing and food supply chain in March 2020 compared to its last year. In addition to the mentioned studies, some studies like [16] offered a toolbox to help the supply chain managers to overcome the extreme condition like pandemic by applying some theoretical tools to reduce the challenge and potential problems. More accurately, a handbook for managing the crisis for the managers has been suggested in this study.

Grocery shopping behavior of the customers was discussed numerously in the literature as it shows that how important is this topic in both literature and real-life application. For instance, [17] specified that the grocery shopping behavior has been changed during the pandemic in the USA considerably. Based on a real-life data from 900 grocery markets, they found that as the spread of COVID-19 was increasing, the consumers preferred more generally to shop not inside the stores, while in the opposite condition, most purchasing methods were appealing to follow by the consumers.

A more general study [18], investigated food shopping behavior and consumption after starting the pandemic in two big cities in the USA. To so that an ample online consumer survey was conducted, and the result of the survey showed that about three-quarters of consumers purchased as they could get to out of stock situations while half the respondents did their shopping more than they did before the pandemic. The survey displayed that at the beginning of the COVID-19, more consumers preferred to avoid inside store shopping, while a 255% increase in the number of pickup shopping and 158% increase in grocery delivery services of the participants. The purchasing trend of major food items seemed to be the same for most consumers, while fast food items were more preferred because of a sharp tendency to stay at home and to consume this type of junk food. And [19] considered a big data study of the five biggest retail stores in Austria to evaluate the consumers' satisfaction in this country. The analysis of evaluation comments displayed that store layout and facilities, as well as product availability and waiting time, had a significant impact on consumer satisfaction.

The closest direction to this study -as mentioned before- is the studies which discuss the online grocery purchasing on apps or home delivery services. Several studies considered this topic with different views, for instance, [20] was one of the first empirical papers to study the effect of online platforms on extreme conditions like shortages and pandemic, or namely the so-called food stockpile behavior. By conducting a general survey, they found that the fresh food online platforms were highly likely to face a panic stockpile behavior than the offline shopping in China. While the revenue of most sectors has dropped significantly, the only sector which was able to increase the revenue was grocery retailing and particularly the online retailing sector, with an increase in revenue of 24% in Germany [21]. And [22] studied the factors that influenced the customer choice of an online grocery market by identifying the drivers of online store choice. By driving these factors, they showed how a consumer experience will be doubled over these factors.

In another case study which was conducted in Finland [23], they displayed the demographic and the living status of online grocery consumers through a large-scale survey during the COVID-19. Not surprisingly, most of the customers in the survey were less than 45 years old and for female customers with an age more than 45, there was a downtrend to prefer online grocery shopping after COVID-19. And surprisingly, as household size and income attitudes were increasing, there were more prone to do online grocery shopping, according to the data. Further, an online customer satisfaction case study in Portugal based on [24] indicated that there is a high positive influence of young male consumers with the high levels of income and education trend to online grocery shopping. Therefore, for the post-COVID period, the finding confirms that if the customer has a pleasant online shopping experience during the COVID-19, most probability, s/he intentionally will continue online grocery shopping.

A comprehensive study that compared the consumer online grocery shopping attitudes before and after COVID-19 is [25]. Based on their finding, social elements like sharing the customer favorite items may influence their sale rates. More importantly, their results verified that the social influences and price value

factors remained quite at the same level compared to before COVID-19 data analysis. Also, according to studies of [26], there was a remarkable induction (around 10% on average) in online grocery product availability like vegetables and fruits, without any remarkable increase in the online prices in the India grocery market during the pandemic. On the other side, the products which were gathered from farms had a 20% drop according to the real-life data. Their results showed that the long-distance food supply chain, compared to the nearby-distance transportation supply chain, have been highly affected in terms of both monetary and social consequences for the urban consumers and farmers during the pandemic and restrictions. Finally, [27] discussed the supplemental nutrition assistance program online grocery delivery challenges in California during the COVID-19. An important lesson which is clear from the study is that the high rate of COVID-19 cases in the US did not a significant connection with SNAP online delivery convergence. Hence this delivery program can be a successful online grocery delivery system.

Despite a remarkable increase in the online grocery supply chain studies in the literature, to the best of our knowledge, there is not a related or partly related study which addresses the online grocery shopping analysis in Turkey. Therefore, this study can somewhat cover this gap in the literature. To make clear to the reader, the discussed studies in this section are summarized in the below table under four main categories namely food supply chain, online food supply chain, grocery supply chain and online grocery supply chain. The studies discussed in this section are categorized based on their key results in Table 1.

Table 1. The summery of mentioned studies

Categories	Autor(s)	Key results
Food supply chain	Aday and Aday [5]	Flexible food supply chain is a good response to COVID-19.
	Hobbs [6]	Canadian agri-food model can be considered as a resilient food supply chain.
	Rizou et al. [7]	Safety of food supply chain levels is important to control COVID-19 spread.
	Singh et al. [8]	A mixed warehouse system can be a solution for exceptional conditions like COVID-19.
	Mishra and Rampal [9]	Some governmental strategies have been suggested to solve the food insecurity problem in India.
	Thilmany et al. [10]	Some local and regional food systems were identified o control the unstable demand and policy changes during the pandemic.
	Mor et al. [11]	Food supply chain for post-COVID needs an unprecedented safety, technology, and policy-measures.
	Özbek et al. [12]	The most complaints with respect to online food delivery in Turkey were delivery gap and communication gap.

Online food supply chain	Meena and Kumar [13]	The Indian consumers were more regarded to the social responsibility of the online delivery companies, while for American consumers, the financial dimensions were crucial.
	Mac Chain et al. [14]	The most important factor for customer satisfaction with respect to online food delivery in the USA was the quality of service.
Grocery supply chain	Liu [15]	The manufacturing processes of grocery products have dipped remarkably in both France and Germany during pandemic.
	Craighead et al. [16]	A toolbox was offered to help the supply chain managers to overcome the pandemic.
	Grashuis et al. [17]	As the spread of COVID-19 was increasing, consumers preferred more generally to shop not inside the stores
	Chenarides et al. [18]	According to the survey, more consumers preferred to avoid inside store shopping, while a 255% increase in the number of pickup shopping and 158% increase in grocery delivery services of the participants in the USA.
	Brandtner et al. [19]	It was given that the layout and facilities, as well as product availability and waiting time had a great impact on consumer satisfaction in Austria.
	Hao et al. [20]	The fresh food online platforms were highly likely to face a panic stockpile behavior than offline shopping in China.
	Lodni et al. [21]	The grocery retailing and particularly the online retailing sector with an increase in revenue of 24% in Germany.
	Melis et al. [22]	

		Which factors influenced the choice of an online grocery market in COVID-19 period.
	Eriksson and Stenius [23]	The demographic and the livingstatus of online grocery consumers were investigated by a survey during the COVID-19 in Finland.
Online grocery supply chain	Gomes and Lopes [24]	Online consumer behavior analysis was discussed according to an online survey in Portuguese.
	Tyrväinen and Karjaluoto [25]	A study that compared the consumer online grocery shopping attitudes before and after COVID-19. The results verified that the social influences and price value factors remained quite at the same level compared to before COVID-19 data analysis.
	Mahajan and Tomar [26]	There was a remarkable induction (around 10% on average) on online grocery product availability like vegetables and fruits in India.
	Foster et al. [27]	The result showed that the COVID-19 cases in the US did not a significant connection with SNAP online delivery converge.

3. GROCERY SUPPLY CHAIN MANAGEMENT

The grocery supply chain was affected dramatically by the pandemic in a global level. Many supermarkets and suppliers have experienced such difficult times which were not able to meet even the normal demand. Some problems happened because of the lockdown and travel limitations that have already disrupted the logistic operation systems in many countries, and directly doubled the servicing problems [28]. Moreover, a drop in raw materials and price fluctuation could mention as the factors. On the other side, staying at home has changed the customer shopping attitude obviously. For this reason, an accurate demand forecasting is crucial in the exceptional times like COVID-19. By considering the literature findings, it seems that many grocery markets have changed their traditional servicing systems from offline to online, or at least introduced new online delivery lines [29]. As a case study, according to [30], the panic-buying behavior of consumers in Germany, by March 2020, the purchases of hand sanitizer, household cleaners, facial tissue, and toilet paper increased to nearly 30 times. This type of crazing shopping behaviour may have been attributed to inventory stock-outs rather than settled behaviors.

Generally, many companies which were linked to the international suppliers faced a drastic decline in sales, because of decreasing in raw material production, fluctuating in raw material prices, and disrupting in the logistic operations. Thus, the companies were enforced to reschedule their food supply chain processes and

make some crucial decisions to deal with the challenge. As well as the companies, other stakeholders in the value chains (suppliers, manufacturers, customers, etc.) encountered the problems such as delay in delivery, problem in the payment methods or running out of stock. Clearly, the customers faced a remarkable increase in prices both in online and offline grocery shopping.

Finally, by disruption of the availability of goods originating abroad, especially in China [10], companies have made efforts to optimize the limited finished products, semi-finished products, and raw materials in their hands to determine which area they will use. The sudden and unprecedented change in demand and supply pose the significant logistical and security challenges. After overcoming the first wave of crisis, a dynamic management was important to ensure that logistics processes are balanced. The COVID-19 pandemic has increased the need for visibility of suppliers across all layers of the food supply chain. Critical food supply chain components properly assess potential operational and financial weaknesses, dependencies, and have the visibility of active data to plan for emergencies, manage, and create a more flexible supply chain has become ever more important in the long run. Because many food supply chains are managed manually, simple processes such as changes in orders, quantity, location, or switching to a different supplier have turned into long and complex procedures when a problem arises.

4. STUDY DESIGN

To understand the consumer's shopping behavior during the pandemic in Istanbul, a survey was conducted to analyze the following research questions. Indeed, these questions and answer might be considered as a guideline to help the companies to manage home delivery services in the exceptional circumstances like COVID-19 pandemic. Clearly, answers to the questions will not only improve the company's profit, but also maximize the consumer's satisfaction. The questions are as follows:

- How often the customers do online grocery shopping?
- Which items are more preferred to purchase in online shopping?
- Which factor\ s influence the online grocery purchase more?
- Which strategies are crucial to develop the future business models in the online grocery market?

These questions were considered in the survey and the participants were asked either via an online platform or WhatsApp. To understand how a grocery retailer can continue its responsibility with respect to its customers, we selected three top online groceries in Istanbul, namely Getir, Migros and A.101. The main reason for choosing these three grocery retailers is that they address a wide range of consumer segments in Istanbul. More importantly, the aim of this survey is given a supporting system to these companies to upgrade their online services both in COVID-19 and post-COVID-19.

4.1. Survey Instrument

The survey was included 10 questions related to the consumer's shopping attitude by 300 participants who lived or stayed in Istanbul during the pandemic, especially in lockdown times. The questions involved the factors which measured the participant's shopping behavior as whether s/he prefers the online grocery shopping or not, if yes, which factor/s are crucial to select a specific retailer and why s/he selects that market again? The list of all questions is given in Table 2 as follows:

Table 2. Survey questions

Questions	Possible answers
1.What is your gender?	Female- Male.
2. What is your age range?	0-17, 18-39, 40-64, 65+.

Table 2. Survey questions (continued)

Questions	Possible answers
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4. Which sector do you prefer most in online shopping?	Food, Clothing, Electronics and Others.
5. How often do you use online grocery shopping at this period?	Every day, once in three days, once in a week.
6. Which companies do you use more when doing online shopping?	Migros, Getir, A.101 and Others.
7. What is the most important factor in your preference to select this retailer?	Fast, Quality, Price, and Others.
8. Does advertisement have an impact on your choice?	Yes\ No.
9. Which option do you use more at payment of this retailer?	Cash, Credit Card.
10. Which kind of foods do you prefer to purchase?	Bakery, Pulses, Frozen, Meat Products, Junk Food and Others.

Before analyzing the survey, in the next section, the mentioned grocery retailers in the survey will be introduced briefly.

4.2. The Online Grocery Retailers

As aforementioned, in this study, three large grocery retailers with online delivery services in Istanbul were considered. The first supermarket which will be introduced is Migros. Migros Turk has been founded by the cooperation of Swiss Migros and Istanbul Municipality in 1954 [31]. By 2020, there exist 2213 Migros markets and 30 headquarters across Turkey. Migros was one of the leading grocery retailers to give online shopping service in Turkey. Before the pandemic, Migros meet the large demand by providing a wide range of items, from fresh vegetables to appliances. During the pandemic, it has increased the capacity to give a better service to its customers. To do that, Migros opened 105 new stores as 79 M's (small stores), 21 MM's (medium stores), 5 MMM's (large stores), 71 Migros Jet, 5 Macro Center, and 2 wholesale stores in 2020. Furthermore, during this period, it boosted online services by introducing new apps, increasing courier numbers, and doubling working hours [32].

The second company in this study is Getir, founded by Nazım Salur in 2015 [33]. It was a startup company which its primary aim was to deliver items lickety-split. This company doubled its sales in the second half of 2019 by reaching a record of 1.5 million orders in December. Getir servicing is via app, and it offers an on-demand super-fast delivery service on the grocery items. Further, it delivers the ordered food from independent restaurants to homes [34]. At the beginning, Getir was mostly preferred by the customers with urgent needs. However, after the pandemic, by offering more items in the app, more customers willing to order via app. As a result of this demand, the basic grocery items available in Getir app was grown approximately 165% compared to the pre-COVID-19 and the fruit and vegetable sales grew by nearly 75%. Also, they experienced over 60% growth in the personal care and home care categories. And not surprisingly, the number of active users reached 2 million during the pandemic. While Getir services addressed the young customers more before the pandemic, after the COVID-19, the average age of users between 18 years old and 45 years old has increased to 70%.

The last grocery retailer as mentioned in the study is A.101. This supermarket merged with another well-known market in Turkey, namely BIM, in 2008 and provided its service under the new brand namely A.101. Today, A.101 is keeping its development up with opening a new branch each day and providing low-cost food and consumption services. Therefore, it is mostly known as a hard discount market in Turkey. Moreover, by around 10,000 grocery markets, A.101 is the largest grocery retailers in Turkey and, at the same time, the most disabled and female worked grocery retailers in Turkey [35]. A.101 have applied several innovation projects, for example, at the beginning of the lockdown, while only offline stores of A.101 were active, A.101 turned to online service and introduced its online delivery app in a very short time. Also, there was an impressive strategy applied by A.101 as it has changed its working hours according to the restriction hours in Istanbul and not closed in even on the holidays and religious days.

4.3. Survey Results

In this section, the conducted survey analyses will be explained in more detail. All statistical analyses related to the survey are given in Figures 1-10. As Figure 1 shows, approximately more than half of the participants are female (62%), while only 38% of participants are male. This pattern can be explained in this way that female consumers are more willing to do online grocery shopping in Istanbul, especially through the pandemic, while male customers do not prefer the grocery shopping much. During the pandemic and stay-at-home times, female participants were more involved in grocery shopping and more interested in finding new shopping platforms.

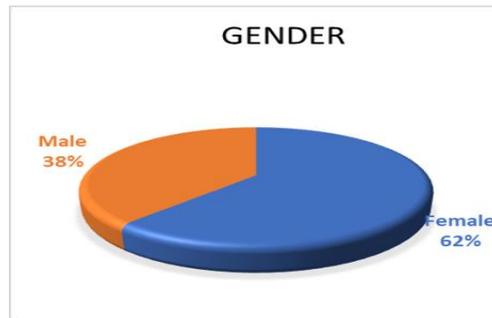


Figure 1. Gender chart

The age range of participants is reported in Figure 2, and it indicates that most participants are between 18-39 years old. In fact, the corresponding question may highlight the difference between young and old customers preferences toward online shopping.

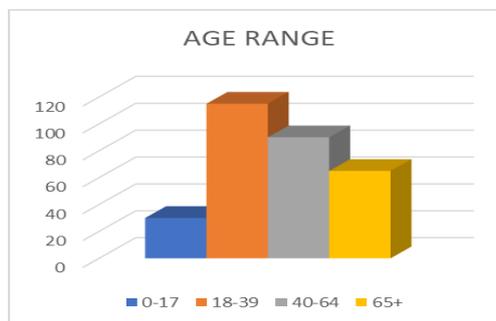


Figure 2. Age chart

According to the Figure 3, approximately 63% of the participants do grocery online shopping when the pandemic was announced in Istanbul on March 2020. This is a remarkable result to explain the consumers' shopping intention during the pandemic in Istanbul. However, it was utterly predictable while many studies reported a high demand toward online grocery delivery and sales in COVID-19.



Figure 3. Shopping preference chart

To determine which items are more preferred to put in the shopping baskets of the participants, the fourth question was asked. As Figure 4 reports, food products, i.e., dairy products, fresh products, and frozen

foods, are the popular and more used items. It was also expected since the stay-at-home special condition forced people to order more grocery items and less clothing and appliances.

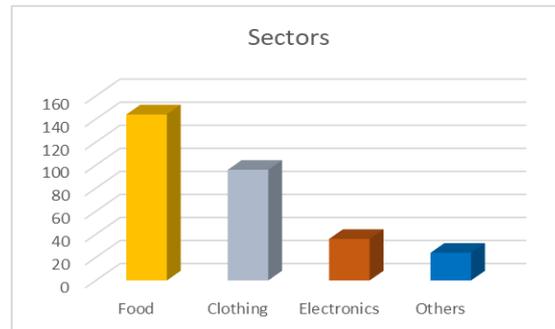


Figure 4. Sector chart

To understand how often the participants order through online grocery delivery apps, the question five was asked. Based on Figure 5, approximately 60% of participants do online shopping every 3-4 days in a week, and less than half prefer to purchase once a week.



Figure 5. Frequency chart

Among the underlying grocery retailers in this study, as Figure 6 illustrates, the preferred company is Getir, and after that A.101 and Migros, respectively. The others option was also added to give the participants more possibility when they were answering the questions.

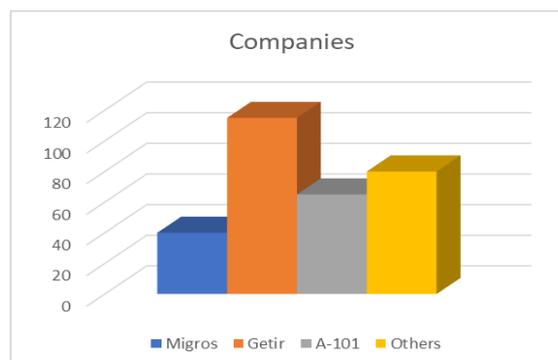


Figure 6. Retailers chart

As Figure 7 illustrates the most important factor for most participants to select a grocery online delivery retailer is the delivery time. A fast delivery service incurs happier consumers! After that the next important factors are the price of the product and the quality of delivery service. During the pandemic, especially in Istanbul, most delivery companies could not effectively manage the online delivery systems, sometimes because of huge demand and large working hours and sometimes due to inventory stock outs. Therefore, from a customer perspective, an on-schedule delivery without any excuse in the delayed service, especially in the quarantine times, receives a higher point.

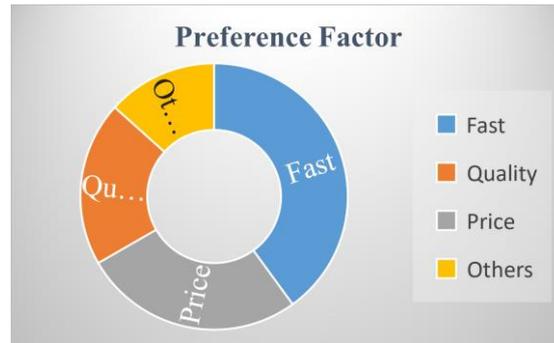


Figure 7. Preference factor chart

Although many grocery retailers have the online home delivery services before the pandemic in the market and were well-known in the market, a rich and wide advertising network seems essential to keep the current customers and attract new ones by the pandemic. Based on question 8, almost 55% of the participants say that they did not watch or read any ads related to the online grocery services in COVID-19. This finding be explained that, except A.101, which has introduced its application after COVID-19, the other two retailers were already known in the market, and not need to invest more on marketing.

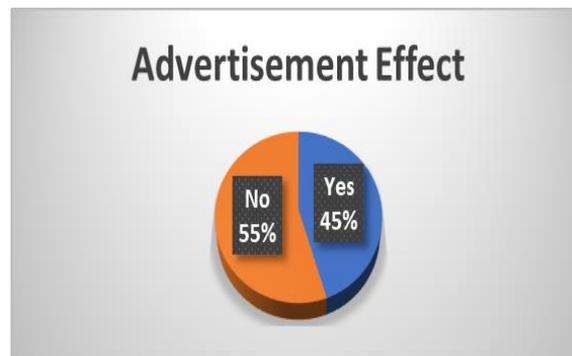


Figure 8. Advertisement effect chart

Question 9 verifies the most preferred payment systems used by the participants. According to Figure 9, approximately 80% of payments were did by the credit cards, while only 20% of the participants did shopping by cash. This result is somehow understandable, because of the pandemic condition, as the paper money was believed to speed up the spread of the virus, therefore more people prefeed to use the online payment system.

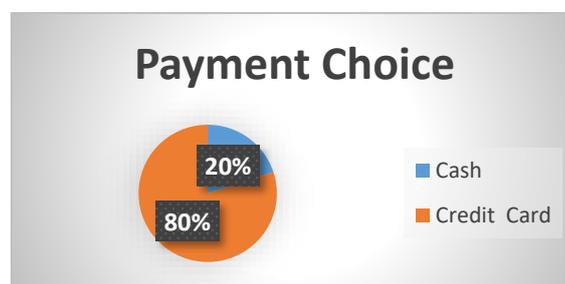


Figure 9. Payment choice chart

The last question verified the preferred grocery items in the basket of customers, and as it is shown in Figure 10, the bakery items are on top of the shopping list of the participants and frozen items and junk food are less prefeed items. The results were expected as during the pandemic, the primary needs such as the bakery items are more consumed compered to unhealthy items like junk foods.

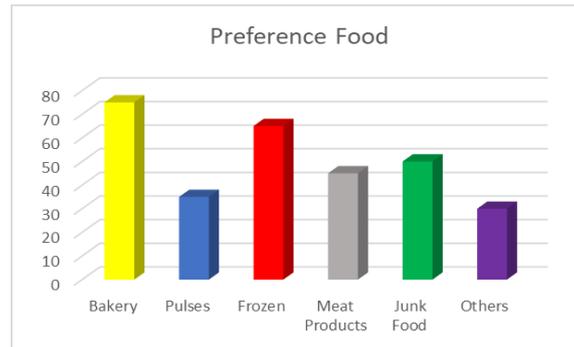


Figure 10. Preferred items chart

5. THE SWOT ANALYSIS

In this section, SWOT analysis were performed according to the results of the conducted survey to help Getir, Migros and A.101 to improve their long-term strategic developments in the online grocery markets.

The first SWOT analysis matrix belongs to Getir, as given in Table 3, since Getir is ranked as the most preferred online grocery retailer according to the survey data. With respect to the strengths, a remarkable fast delivery system thanks to its numerous numbers of couriers, grocery item variety, a flexible servicing time, a user-friendly app, and appealing advertisements. However, there are some weaknesses including a limited servicing zones in Istanbul and relatively expensive grocery items offering by Getir. After all, in relation to the external factors, there are several opportunities in grocery online market which Getir may use these external factors to keep its position strong in the market. The opportunities may list as to enter in the Middle East and neighboring countries, to collaborate with new startup and high-tech companies, and to implement the new high-tech infrastructure operations and big-data algorithms to optimize its online apps. Finally, threat factors may the changes in consumer preference from online to offline shopping after the pandemic and the emergence of some potential new competitors.

Table 3. SWOT analysis matrix of Getir

Factors	Helpful	Harmful
Internal	Strengths S1: Fast delivery system S2: Grocery item variety S3: Flexible servicing time S4: User-friendly app S5: Attractive advertisements	Weaknesses W1: Limited servicing areas W2: Expensive grocery items
External	Opportunities O1: Entering to international markets O3: Collaborating with new startups O4: Implementing new technology and AI trend	Threats T1: Change from online to offline preferences T2: New competitors in the market

In Table 4, the SWOT analysis matrix of A.101 grocery online retailer is provided. As mentioned before, A.101 is mostly well-known for its great discount sales and cheap grocery and non-grocery items. Before COVID-19, A.101 services were limited to only offline stores, however, after the pandemic, the online grocery app of A.101 was introduced officially to the market. Hence the performance of A.101 can be evaluated after this time under some external and internal factors. The strengths of the company with respect to online service are the cheap grocery items, several discount announcements, a wide variety of products, multiple stores and warehouses and skilled and experienced workforces. It is also worth noting that launching and introducing an online delivery system in such a short time is a success of A.101 compared

to other two companies in this study. Weaknesses can be listed as when the discount booth is scattering, the quality of products mostly going low, not enough a wide and updated advertisement network, and not up-to-date app. Associated with external factors, offering the religious holidays and Ramadan month special products with low prices and implementing new technologies to improve online apps may the opportunities. Finally, threat is arriving new competitor in the market.

Table 4. SWOT analysis matrix of A.101

Factors	Helpful	Harmful
Internal	Strengths S1: Cheap grocery items S2: Discount sales S3: Grocery item variety and availability S4: Multiple stores and warehouses S5: Skilled and experienced workforce	Weaknesses W1: Low quality of items in sales period W2: Not enough ad to introduce the online service W3: Not updated app
External	Opportunities O1: Special religion days and holidays O2: Implementing new technology and AI trend	Threats T1: New competitors in the market

Finally, the last SWOT analysis matrix is given in Table 5. As discussed before, Migros is known as the oldest supermarket in Turkey, it operates 2213 Migros branches, 61 Macro centers and 30 ramstores branches by 2020, it also started to give online services by introducing two new applications called Migros Sanal Market and Hemen Migros. The strength factors with respect to online grocery service are reliance and predisposition to technology thanks to its long experience history, a user-friendly app, and the skilled and experienced workforce. In contrast to its strengths, there are several weaknesses such as the delayed and un-finished delivers, de-centralized system. The opportunity is implementing high-tech infatuations operations to improve the apps. And finally, the threats can be mentioned as appearing competitors in the market and courier shortages.

Table 5. SWOT analysis matrix of Migros

Factors	Helpful	Harmful
Internal	Strengths S1: Long online servicing experience S2: User-friendly app S3: Skilled and experienced workforce	Weaknesses W1: Delayed and not-finished deliveries W2: De-centralized inventory system
External	Opportunities O1: Implementing new technology and AI trend	Threats T1: New competitor in market T2: Courier shortages

5.1. Recommendation Strategies

Based on the SWOT matrices of the companies in the last section, apparently, some challenges are in common. For example, all online retailers need to invest more in high-tech infrastructures such as more user-friendly apps, optimal network systems, advanced algorithms to predict the consumer's behavior and

preference, optimal delivery routes, and smart inventory systems. These investments may consider in the medium to long-term action steps as far as the company plays an active role in the online grocery market in Turkey. In this way, the factors may consider as the increasing operational efficiency, keeping data security at a high level, being ready for the sudden changes in the market, and being able to make analytical forecasting.

However, these investments may make the companies stronger in the market when a new competitor arrives. Besides these strategies, one important factor that online grocery retailers should consider is the risk management in the extraordinary times like outbreaks. It is crucial to conduct a risk assessment for suppliers and develop action plans specifically for them. Companies should organize supplier development programs parallel with supplier-derived instant data tracking and analytical food supply chain solutions, whose value reappears with the pandemic process.

Moreover, a global threat as was discussed in Migros SWOT matrix is T2. Courier shortage problem is a real threat which directly affects delivery times and a remarkable impact on the customer satisfaction and market size. As mentioned in S1T2, the companies who face this problem may encourage the delivery drivers to join them by representing the company's long good prestige and reputation.

Finally, if an online grocery company would like to be more active in online grocery delivery market in post-COVID, it is strongly recommended that all supply levels of company be updated according to the customer intention and attitude.

6. CONCLUSION

Online grocery supply chain management was investigated in this study to develop a comprehensive framework as how the grocery retailers can provide a reliable and efficient online service under the pandemic restrictions in Istanbul. To do so, three large grocery companies which have provided online delivery services in Istanbul were considered. The retailers are addressing a wide range of the consumers by offering a manifoldness product variates in different prices. Hence, to understand consumer's grocery shopping and consumption behavior of these markets during COVID-19, a survey was conducted by around 300 participants from Istanbul. The results of the survey addressed the main research questions of the study. The findings showed that there was an increased trend in online grocery shopping in Istanbul during the pandemic, and bakery and frozen foods were preferred grocery items. Furthermore, to help the grocery online delivery companies to have a better performance with respect to the consumers and a higher monetary return in COVID-19, first the SWOT analysis matrices were built up for all underlying companies, and then some managerial recommendations were suggested. Investment in technological operations and an efficient risk management system are crucial to be succeed in this market. Finally in a nutshell, the study showed that online grocery retailing has a strong potential not only for ongoing companies, but also for new ones who would like to maximize their profits in a new market.

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CONFLICTS OF INTEREST

No conflict of interest was declared by the authors.

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