





ONLINE GROCERY SHOPPING BEHAVIOR AMONG CONSUMERS IN SINGAPORE

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ABSTRACT

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The globalization trend during the Covid-19 pandemic showed that there are more consumers willing to shop online than visit physical stores. The purpose of this study is to investigate the influence of convenience, service quality, and social factors on consumer online grocery shopping behavior in Singapore during the Covid-19 pandemic. Data were collected from 153 respondents in Singapore via a survey, which was distributed through an online platform. A cross sectional study was applied, and the research instruments used were adapted from several past studies. Research hypotheses were analyzed using partial least squares structural equation modeling (PLS-SEM). The results indicate that convenience ($\beta = 0.360$, $t = 4.063$, $p < 0.01$) and service quality ($\beta = 0.416$, $t = 5.495$, $p < 0.01$) significantly influence consumer online grocery shopping. However, social factors ($\beta = 0.042$, $t = 0.490$, $p > 0.05$) have no significant influence on consumer online grocery shopping. With the help of the Theory of Planned Behavior, the present study has provided support for previous studies as well as clarified the roles played by convenience, service quality, social factors in consumer online grocery shopping behavior in Singapore.

Contribution/Originality: This study provides important insights for businesses and organizations to consider when implementing convenience and service quality measures in their marketing processes to achieve and maintain success. Additionally, previously published studies that have investigated online grocery shopping behavior are rarely based on countries such as Singapore.

1. INTRODUCTION

Innovations in technology have caused a change in shopping activities among consumers (Schüler, Fee Maier, & Liljedal, 2020). Many manufacturers are moving from business to business (B2B) to business to consumer (B2C) businesses as many consumers are now turning to online shopping (Rajan, 2019). Online shopping is defined as the purchase of products and services via the internet (Rajani & Nakhat, 2019). Benefits of online shopping include saving time, cheaper prices, and convenient payment methods (Jadhav & Khanna, 2016). However, online shopping has some limitations compared to traditional shopping in physical stores; consumers do not have a clear sense of the products they would like to purchase, including seeing, touching, and tasting (Abdullah Salman & Mahdi Sahi, 2017). It is difficult for online retailers to retain consumers as there is considerable online competition (Cosar, 2017). Additionally, online consumers have more bargaining power because the internet has various means of

attracting customers such as online shopping, purchase and delivery of products and services (Ahmad, Rahman, & Khan, 2017).

Nowadays, consumers can purchase a huge range of products or services from “brick and click” retailers (retailers that have both physical and online stores), ranging from electronics, clothing, and groceries, at any time at their convenience (Chin & Goh, 2017). Due to the increased usage and penetration of the internet, the number of people shopping online has increased (Nwaizugbo & Ifeanyiichukwu, 2016). In 2021, an estimated 2.14 billion people worldwide were expected to purchase goods online (Statista, 2020). At the same time, global e-commerce sales were forecast at USD\$4.891 trillion. Additionally, projections showed that e-commerce sales worldwide are predicted to grow to USD\$6.4 trillion by 2024. Especially during the Covid-19 pandemic, people started to rethink the way they shopped for groceries and for some it became necessary to purchase online (Alaimo, Fiore, & Galati, 2020). The increasing trend of e-commerce also can be seen in Singapore’s online grocery shopping, which is forecast to reach USD\$3.687 million by 2024. Meanwhile, the cost of food and personal care is also an increasing trend. This shows that the trend of online grocery shopping will continue to increase with the enhancement of telecommunication technology and a trusted legal system in Singapore that creates a good platform for e-commerce (Sam & Sharma, 2015). Bucko, Kakalejčík, & Ferencová (2018) argued that Asian families still tend to shop using traditional methods, but recently, with the increase of middle-range families, more people are now willing to shop online. However, from the online retailer perspective, a concern is that there are many challenges in switching from a traditional store to selling online (Sarkovská & Chytková, 2019). Consumers have different behaviors and attitudes toward grocery shopping as it involves many different products (Hanus, 2016). For example, customers have different expectations of a service; some wish to receive their items on the same day they place the order and some will be concerned about products being damaged when delivered (Qin, Su, Huang, Wiersma, & Liu, 2019). On the other hand, some consumers prefer to interact directly with products and people (Van Droogenbroeck & Van Hove, 2017). Many studies have examined online grocery shopping behavior in both Singapore and global contexts (Loketkrawee & Bhatiasevi, 2018) before Covid-19. However, there are relatively few studies on how consumers performed online grocery shopping during the Covid-19 outbreak (Hartono et al., 2021). Yeung & Ang (2016) conducted research on online fashion retail in Singapore and focus more on the development of blogshop selling through online platforms. Furthermore, Sam & Sharma (2015) conducted research in Singapore regarding factors that drive online consumers to continue to use online shopping. At that point in time, most consumers were unwilling to shop online for groceries due to being unable to physically check the quality of the products, especially fresh produce. However, this is different from the data obtained by Statista (2020), who found that purchases of food and personal care products online are higher now compared to previous data. Chin & Goh (2017) researched online grocery shopping in Malaysia using the theory of reasoned action (TRA) and technology acceptance mode (TAM) models to investigate consumers’ acceptance level of online grocery shopping. Although there are several studies related to online grocery shopping, studies related to Singapore are still limited. This gap in the literature has motivated the researchers to conduct research in this field. Theoretically, this study contributes to the enrichment of the literature on online grocery shopping behavior during the Covid-19 pandemic, which is currently a less explored topic in the context of Singapore consumers. Therefore, this study aims to answer the question: “What are the effects of convenience, service quality, and social factors on online grocery shopping behavior among consumers in Singapore?” Answering this question will provide insight for businesses and organizations on the marketing processes of a successful business.

2. LITERATURE REVIEW

2.1. Underlying Theory

The foundation for this study is the Theory of Planned Behavior (TPB). The TPB is an extension of the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). On top of attitudes and subjective norms that are

already covered in the TRA, the TPB includes perceived behavior that is defined as a person's belief in his/her ability to control that behavior (Madden, Ellen, & Ajzen, 1992). From the perceived behavior control, there are two contexts: self-efficacy, which from an online shopping perspective refers to consumers' assessment of their ability to shop online; and facilitating conditions, which are influenced by external factors, such as time and technology (Deka, 2017). This indicates that consumer attitude is affected by consumer behavior and the people around them (Li & Ohlsson, 2017). The TPB has been widely used by a lot of researchers to predict consumer-specific behavior (Ha & Nguyen, 2019). It provides a better explanation compared to the TRA as the TPB assumes a person will perform a certain behavior if they know they can control it (Ajzen, 1991). Online shopping will be carried out when a consumer has a positive attitude toward this activity (Ajzen, 2002). Hence, the fundamental theory and conceptual framework for this research were devised based on the TPB.

2.2. Convenience and Online Grocery Shopping Behavior

Busy schedules mean that some consumers prefer to use online grocery shopping compared to visiting a physical shop because it is more convenient and they can save time (Li & Ohlsson, 2017). Sulastrri, Nawi, Abdullah, & Latif (2017) asserted that online grocery shopping offers a hassle-free and time-saving experience. Consumers save time as they don't have to travel to the store and therefore they have more available time to purchase as they don't have to go through the process of picking up items and paying at the store (Andleeb, 2017). Time saving plays an important role because it allows consumers to browse the items directly from the website which saves unnecessary time browsing the selection of products in a physical store. Furthermore, it allows consumers to shop any time they want. This is even more important for the consumers who are unable to physically travel and carry groceries home due to disability (Kurnia, 2003). However, a few factors cause unwillingness among consumers to do their grocery shopping online, including the inability to physically to check product quality before purchase, especially perishable products such as meat, fish, and vegetables (Sulastrri et al., 2017). Thus, some consumers would rather purchase dry groceries that can't be damaged easily during delivery (Li & Ohlsson, 2017). Pauzi, Thoo, Tan, Muharam, & Talib (2017) reported that convenience is vital for online grocery shopping as shoppers are able to compare, access, and search the product information. Brand, Schwanen, & Anable (2020) also reported that convenience drives online consumers to continue to shop for groceries as the online retailers provide a home delivery service. Hence, we hypothesize that:

Hypothesis 1 (H1): Convenience has a positive influence on online grocery shopping behavior.

2.3. Service Quality and Online Grocery Shopping Behavior

According to Liu, Lee, & Hung (2017), service quality is defined as the customers' measurement of the service they received from a company compared to what they expected. It is always used as a guideline for customer satisfaction and loyalty, and to check for any gap in expectation versus actual service received (Yadav, Agrawal, Khandelwal, & Tripathi, 2018). There are a few components of service quality, which are: (i) reliability (the ability to solve customer issues while using the product); (ii) assured quality (employee service received by consumers); and (iii) response quality (timely communication with customers). Customer satisfaction levels are correlated with company service quality (Al Hakim & Maamari, 2017). Satisfied consumers lead to repeat business, and these customers will provide good reviews and share their experiences with other people (Liu et al., 2017).

Yadav et al. (2018) also support the idea that customer satisfaction will influence brand loyalty, bringing a strong, positive revenue to a company. It is different from the brick and mortar retail stores because online shopping doesn't provide face-to-face interaction for customers, thus quality e-services are essential in order to satisfy customers. The delivery service received by consumers is a critical measurement of customer satisfaction as the products must be delivered complete, undamaged, and within the promised delivery time (Cosar, 2017). For online retailers, logistics are a major part of fulfilling orders, including inventory management, delivery, and return

administration (Nguyen, de Leeuw, & Dullaert, 2018). According to Weber & Badenhorst-Weiss (2016), maintaining a consistent delivery service is time-consuming because it requires planning and commitment, especially for perishable items that need to be delivered to customers on time. If an online retailer is able to replace damaged products and expedite the delivery, it will easily satisfy and retain customers and attract new ones (Kumar & Velmurugan, 2017). Consumers expect online retailers to provide responsive customer support that is similar to offline shopping (Singh, 2019). This is shared in the study by Ismana-Ilisan (2017), where service is key to achieving maximum customer satisfaction in grocery retail. Hence, we hypothesize that:

Hypothesis 2 (H2): Service quality has a positive influence on online grocery shopping behavior.

2.4. Social Influence and Online Grocery Shopping Behavior

People tend to adjust their thoughts to ensure balance in their social life (Pauzi et al., 2017). Consumers making online purchase decisions will determine the same information through different sources. They will be influenced by family, relatives, or friends to shop for groceries online, which is a normative social influence from the people around them (Alaimo et al., 2020). The second method is informational influence, when consumers receive information through others and expect this to be accurate and truthful (Chou, Wang, & Tang, 2015). There are several studies that support the idea that social factors influence consumers. For instance, Sreeram, Kesharwani, & Desai (2017) reported that individuals tend to accept suggestions or recommendations from others to maintain a favorable image. Ingham, Cadieux, & Berrada (2015) also support the idea that social influences are a significant influence of online shopping behavior. However, Chen (2008) argued that the impact of informational influence is higher than normative influence when making online shopping decisions. Teo, Leng, & Phua (2018) mentioned that individuals tend to rely on the people they know for judgement and perception as evidence. Meanwhile, Hong, Xu, Wang, & Fan (2017) highlighted that the level of social influence is subject to a person's motivation and whether they are keen on knowing more information before deciding to make a purchase. As online reviews are provided by unknown people, it is important for consumers to evaluate the source credibility and decide whether the information is trustworthy (Chou et al., 2015). In addition, Pauzi et al. (2017) emphasized that social influences from a consumer's close relatives and friends will likely change the consumer's behavior. This is supported by Singh (2019), who conducted a study on online grocery shopping and found that social factors are one of the key influences of online shoppers' behavior. Thus, we hypothesize that:

Hypothesis 3 (H3): Social factors have a positive influence on online grocery shopping behavior.

Figure 1 illustrates the conceptual framework adapted in this study.

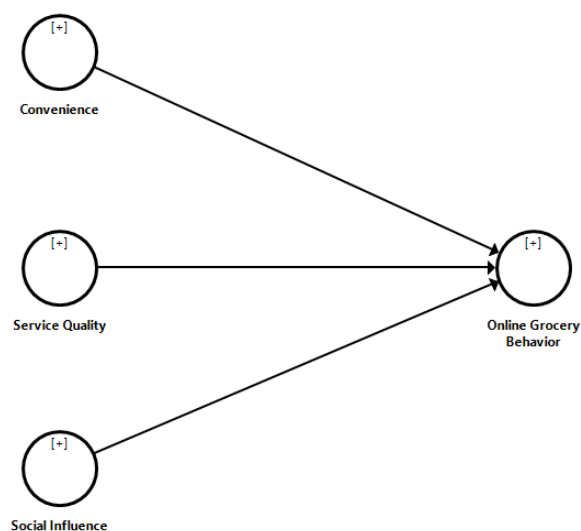


Figure 1. Conceptual framework.

3. METHODS

3.1. Participants and Procedure

The target population for this study was online consumers in Singapore. Singapore was chosen as online business here is growing. The government recognizes the potential of the market and is keen to invest funds to drive innovations in this area (Ministry of Finance Singapore, 2020). To assess the minimum sample size required in terms of statistical power, G*Power was used (Faul, Erdfelder, Buchner, & Lang, 2009). The model in this study has three predictors. By using G*Power with an effect size of 0.15, an alpha of 0.05, and a power of 0.95, the minimum required sample size is 119. Therefore, we can safely say that our study with a sample size of 153 has a power greater than 0.95 and is large enough that the results can be used with confidence. An online survey was conducted through social media, such as WhatsApp and Facebook messenger, to recruit participants using a snowball sampling method. This procedure uses samples related to, or referenced by, previous samples (Taherdoost, 2016). Table 1 shows the summary of the demographic profiles of the 153 respondents. In the gender category, male respondents account for 40.0%, while female respondents accounts for 60.0%. In the age category, respondents aged 31–40 comprise more than half of the total respondents with 56.9%, followed by respondents aged between 21–30 with 24.8%, 41–50 make up 9.8%, followed by respondents aged 51 and above at 7.2%. The smallest age group is 20 and below with 1.3%. In the education level category, the majority of respondents have a bachelor's degree at 48.4%, followed by those with a diploma at 26.1%. Next, a total of 11.8% respondents have completed secondary school level, master's degree accounts for 9.8% of respondents, whilst 3.3% have a certificate, and the smallest group is 0.7% who have a Ph.D.

Table 1. Respondents' demographic profiles.

Demographic Characteristics	Frequency (N)	Percentage (%)
Gender		
Male	63	40.0
Female	92	60.0
Age Group		
20 years old and below	2	1.3
21–30 years old	38	24.8
31–40 years old	87	56.9
41–50 years old	15	9.8
51 years old and above	11	7.2
Education Level		
Secondary School	18	11.8
Certificate	5	3.3
Diploma	40	26.1
Bachelor's Degree	74	48.4
Master's Degree	15	9.8
Ph.D.	1	0.7

3.2. Measures

Online grocery shopping behavior. This construct consists of six items, which were adapted from Prashar, Sai Vijay, & Parsad (2017) using the five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The following items were used: "my likelihood of purchasing products online is high"; "the probability that I would consider buying through an online shopping website is high"; "my willingness to buy through online shopping websites is high"; "I intend to purchase products online"; "I find online shopping to be exciting"; and "while shopping online I feel like I am exploring new worlds". Cronbach's alpha coefficient was 0.92.

Convenience. This construct consists of six items, which were adapted from Sulastri et al. (2017) using the five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The following items were used:

"reducing hassle in terms of traffic congestion and finding a parking space"; "reducing the hassle in terms of store crowds and queuing at the checkout"; "reducing the cost of traditional shopping"; "reducing the effort of travelling, walking, parking, waiting, and carrying items"; "online grocery shopping saves a lot of time"; and "online grocery shopping allows quick shopping". Cronbach's alpha coefficient was .87. *Service quality*. This construct consists of five items, which were adapted from Tzeng, Ertz, Jo, & Sarigöllu (2021) using the five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The following items were used: "the online vendor(s) deliver(s) orders/services in a timely manner"; "the web-based vendor(s) provide(s) customer service and after-sales support"; "returns and refunds are easy with the web-based vendor(s)"; "paying for an item online is easy"; and "it is easy to place orders online". Cronbach's alpha coefficient was 0.87. *Social influence*. This construct consists of five items, which were adapted from Sreeram et al. (2017) using the five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The following items were used: "my family members think that it is a good idea to buy groceries via the internet"; "most of my friends and acquaintances think that shopping groceries via the internet is a good idea"; "people who influence my behavior think that I should buy groceries online"; "people who are important to me think that I should buy groceries online"; and "my colleagues have supported the use of online grocery shopping". Cronbach's alpha coefficient was .91.

3.3. Data Analysis

The aim of this study is to predict the effect of convenience, service quality, and social factors on online grocery shopping behavior. Thus, PLS-SEM was utilized due to its prediction-oriented approach (Hair, Hult, Ringle, & Sarstedt, 2017). PLS-SEM is a comprehensive analysis approach, which can at the same time evaluate the measurement and structural models utilizing the SmartPLS 3.0 software (Ringle, Da Silva, & De Souza Bido, 2014).

Table 2. Results of the measurement model.

Latent Variable	Items	Loading	AVE	CR	Rho A
Online Grocery Shopping Behavior	OGB1	0.886	0.712	0.936	0.928
	OGB2	0.922			
	OGB3	0.879			
	OGB4	0.811			
	OGB5	0.797			
	OGB6	0.754			
Convenience	CON1	0.754	0.600	0.900	0.870
	CON2	0.81			
	CON3	0.728			
	CON4	0.766			
	CON5	0.804			
	CON6	0.782			
Service Quality	SEQ1	0.808	0.663	0.908	0.877
	SEQ2	0.788			
	SEQ3	0.796			
	SEQ4	0.839			
	SEQ5	0.837			
Social Factors	SOC1	0.781	0.732	0.932	0.915
	SOC2	0.857			
	SOC3	0.901			
	SOC4	0.874			
	SOC5	0.858			

4. RESULTS

4.1. Measurement Model Assessment

There are four reflective constructs in the measurement model: convenience, service quality, social factors, and online grocery shopping behavior. First, a measurement model assessment was carried out to establish construct

reliability, discriminant validity, and convergent validity. The factor loadings, composite reliability (CR), and rho_A should be greater than 0.7 (Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2018), and the average variance extracted (AVE) should be greater than 0.5 (Ghasemy, Teeroovengadam, Becker, & Ringle, 2020). Table 2 shows the results of the measurement model assessment using these criteria, demonstrating that the construct reliability and convergent validity for the study model have been laid out. To lay out the discriminant validity of the constructs in this study, we applied the heterotrait-monotrait (HTMT) ratio (Ghasemy et al., 2020). Discriminant validity is established when the HTMT ratio is under 0.85 (Hair, Risher, Sarstedt, & Ringle, 2019). Table 3 shows that the value of the HTMT ratio for all constructs is lower than 0.85; therefore, we can affirm the discriminant validity for this study model.

Table 3. Discriminant validity using the HTMT ratio.

	Convenience	Online Grocery Shopping Behavior	Service Quality	Social Factors
Convenience				
Online Grocery Shopping Behavior	0.708			
Service Quality	0.71	0.731		
Social Factors	0.707	0.538	0.604	

4.2. Structural Model Assessment

Before evaluating the structural model, the collinearity between the research variables was inspected to ensure no lateral collinearity issue (Hair et al., 2017). Table 4 shows that all inner VIF values are less than 5 (Hair et al., 2017), demonstrating that no collinearity issues emerged among the predictor in the structural model. Then, the bootstrap technique with 5000 resamples was utilized to assess the path coefficients of the structural model; also, t-values and 95% bias-corrected confidence intervals were utilized to assess the sign and significance of the path coefficient (Hair et al., 2019). The results show an R² value of 0.528 for online grocery shopping behavior, which is viewed as adequate for behavioral science studies (Hair et al., 2019). The results show that convenience ($\beta = 0.360$, $t = 4.063$, $p < 0.01$) and service quality ($\beta = 0.416$, $t = 5.495$, $p < 0.01$) positively influence online grocery shopping behavior, thus supporting H1 and H2. However, the results show that social factors do not have a significant influence on online grocery shopping behavior ($\beta = 0.042$, $t = 0.490$, $p > 0.05$). Hence, H3 was not supported. Service quality had the strongest influence on online grocery shopping behavior based on the path coefficient, followed by convenience.

Table 4. Results of hypothesis testing.

Hypothesis	Relationship	β	t-value	95% CI	R ²	Results	VIF
H1	Convenience → OGSB	0.360	4.063	[0.178, 0.527]	0.528	Supported	2.04
H2	Service Quality → OGSB	0.416	5.495	[0.271, 0.552]		Supported	1.73
H3	Social Factors → OGSB	0.042	0.490	[-0.146, 0.200]		Not Supported	1.77

Note: OGSB = online grocery shopping behavior.

5. DISCUSSION

The primary objective of this study is to determine whether convenience, service quality, and social factors affect online grocery shopping behavior among consumers in Singapore. Service quality is the strongest indicator of online grocery shopping behavior, followed by convenience. However, social factors were not a significant predictor of online grocery shopping behavior.

H2 of this research is that service quality positively influences online grocery shopping behavior. Our findings further support the research by Singh (2019) and Ismana-Ilisan (2017). The findings imply that service excellence is always a key concern because when consumers purchase groceries online, they expect some flexibility regarding

delivery time and ease of returning goods and obtaining refunds. Generally, consumers in Singapore have excellent knowledge and experience in online shopping and they can search for information quickly because 88.5% of them have internet access (Müller, 2021). Thus, it is crucial for online retailers to provide good service quality, especially when perishable groceries are involved, with on-time delivery and a good returns policy.

The findings for H1 show that convenience has a positive influence on online grocery shopping behavior among consumers in Singapore. This finding further coincides with Brand et al. (2020). We can denote that consumers are more active in online grocery shopping when they perceive there to be an element of convenience. In Singapore, a high proportion of the population have jobs and the average retirement age is 62 years old, which indicates that a lot of consumers are busy working and they have limited time to do the weekly grocery shopping, especially during the Covid-19 pandemic. It is beneficial if online retailers are able to create a more humanized system or application that lets consumers view the real condition of items because some people are concerned about the quality, expiry date, and freshness of the food.

The findings for H3 shows that social influence has no positive influence on online grocery shopping behavior among consumers in Singapore. This finding is inconsistent with those of Pauzi et al. (2017) and Sulastri et al. (2017). It implies that consumers in Singapore are not influenced by social factors. This could be due to the fact that consumers in Singapore nowadays have more knowledge and experience. According to Müller (2021), the online retail sector had double-digit growth for the past few years with 88.5% of Singapore's population using the internet and many consumers already adapted to online shopping. Thus, consumers do not require someone close to them to influence them to use online platforms for grocery shopping.

6. CONCLUSIONS AND CONTRIBUTIONS

The results of this research provide reference and valuable insights on factors that influence online grocery shopping behavior among consumers in Singapore. It is concluded that H1 and H2 are supported, and H3 is rejected because social factors were found to have no significant impact on online grocery shopping behavior. In light of this, our study has revealed that service quality has the greatest impact. Nevertheless, as most online retailers in Singapore are still struggling with issues related to various customer service expectations, the challenges they face in meeting those expectations have proven to be a barrier. Therefore, it is crucial for Singapore online retailers to take adequate measures and make constructive decisions to overcome these barriers in order to be successful in offering and maintaining quality services for consumers during online purchasing. Additionally, the results conform with the Theory of Planned Behavior (TPB), which paints a holistic picture with regard to online grocery shopping behavior. This study has expanded the scope of this theory by examining factors such as convenience and service quality and recognizing them as the forces that drive online grocery shopping behavior in the context of consumers in Singapore. Further studies are needed beyond the Singapore consumers' perspectives, especially to determine the relationship between social factors and online grocery shopping behavior.

In terms of the marketing industry, businesses can focus on the convenience factor, which was determined to influence consumers' online grocery shopping behavior. Online retailers can offer more convenience to consumers by providing flexible delivery. For example, business marketers can send goods within four hours turnaround time with some special charges for those requiring urgent shipment. Also, online retailers can offer membership in order to build consumer loyalty by charging affordable prices. Online retailers could offer a live stream to show the freshness of products and let consumers buy a limited number of units at a cheaper price. This initiative would definitely help to boost sales.

Service quality was the next strongest factor to influence the purchase of groceries online in Singapore. Thus, it is crucial to maintain a good reputation to retain current customers and attract new customers. The two basic terms are on-time delivery and a good returns policy. Consumers have a variety of options when it comes to shopping, and one of the variables they will evaluate is an item's returnability if it does not fulfil their needs. Customers will feel

more at ease about buying from an online store if it has a returns policy that they are comfortable with. This involves businesses implementing a returns policy that offers refunds within 30, 60, or even 90 days after the purchase date. When a customer returns purchased items to an online retailer for a refund, store credit, or a comparable item, this is known as retail return. Returns that are dealt with efficiently can increase customer loyalty and revenue retention. Thus, customers will buy with more confidence and spend more if they know they can get their money back just as readily as they can spend it.

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