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Predicting Satisfaction and Loyalty Toward Online Grocery Delivery Services: A Study Using e-SELFQUAL Framework

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Abstract

The rapid growth of India's e-commerce ecosystem has accelerated the adoption of Online Grocery Delivery services, driven by shifting consumer lifestyles, increased digital penetration, and expectations for convenience. This study examines the influence of e-service quality dimensions—perceived control, service convenience, customer service, and service fulfillment—on customer satisfaction and loyalty, using the e-SELFQUAL framework. Data were analysed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. Reliability, convergent validity, discriminant validity, predictive relevance, and hypothesis testing were conducted. The findings revealed that service convenience, customer service, and service fulfillment significantly and positively impact customer satisfaction, whereas perceived control does not exhibit a significant effect. Furthermore, customer satisfaction strongly predicts customer loyalty toward OGD platforms. These results highlight the crucial role of operational accuracy, responsiveness, and ease of use in shaping positive online grocery experiences. From a managerial perspective, enhancing fulfillment reliability, real-time customer support, and seamless ordering processes can substantially improve satisfaction and long-term loyalty. The study contributes to the growing body of literature on e-service quality by validating the applicability of the e-SELFQUAL model within the Indian OGD context and provides strategic insights for practitioners seeking to optimize customer experience in a highly competitive digital marketplace.

Keywords: Customer Loyalty, Customer Satisfaction, e-SELFQUAL, Online Grocery Delivery, Service Quality.

Introduction

The internet has transformed the landscape of modern communication, commerce and information exchange revolutionizing the way we conduct, access, share and connect our business with customers. During the last few decades, internet penetration, defined as the percentage of a population with access to the internet, has experienced remarkable growth on a global scale. This substantial increase signifies the internet's transformation from a niche technology to a near-ubiquitous force that shapes economies, education, and social interactions. Furthermore, research highlights the dominance of mobile internet, with over 90% of internet access occurring through smartphone (1). A shift in consumer behaviour has significantly contributed to the rise of e-commerce in India, with consumers increasingly valuing convenience, wider product assortments, and time efficiency (2). E-commerce platforms address these preferences by offering competitive pricing, extensive product variety, and home-based shopping convenience, supported by rising disposable incomes and rapid urbanization (3). This influx of resources allows these platforms to enhance their services, offer competitive deals, and expand their reach across the country. Additionally, consolidation within the e-commerce sector, with established players acquiring smaller businesses to strengthen their market position (4). While the growth of internet penetration and mobile commerce has broadly transformed e-commerce in India, one of the most rapidly evolving segments within this ecosystem is Online Grocery Delivery (OGD) (5). Changing urban lifestyles, rising time opportunity costs, and increased demands for speed and convenience in daily consumer activities have all contributed to the quick adoption of OGD services (6).

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Expansion of E-commerce to Other Sectors

E-commerce, once synonymous with online retail, has transcended its boundaries to reshape various sectors. The initial wave of e-commerce focused on tangible goods. However, the emergence of new platforms that cater to services such as travel booking, healthcare, and education. This diversification fosters convenience and accessibility for consumers, allowing them to manage various needs through a single online channel (7). The growth of online shopping, offering consumers a wider range of options and competitive pricing (8). Similarly, the rise of e-learning platforms, providing educational opportunities to broader audiences beyond geographical limitations (9).

E-commerce expansion creates challenges and opportunities for established businesses in various sectors. Studies suggest that traditional retailers need to adapt by seamlessly online and offline (Omni channel approach) to compete effectively (10). E-commerce platforms need to ensure data security and transparency to gain consumer confidence in areas where offline interactions were previously the norm. There is a direct link between the rapid growth of e-commerce and digital services (11). Additionally, the growth of online advertising and marketing plays a tremendous role in promoting e-commerce platforms and reaching a wider customer base (12).

Online Grocery Delivery

The customary habit of visiting the local Kirana or small grocery store regularly, either weekly or monthly, to purchase groceries is now a thing of the past. The widespread adoption of smartphones has further transformed shopping behavior, as mobile devices have become the primary channel for online retail access, particularly in metropolitan and urban regions (13). This shift is particularly noticeable in India's metro and urban cities, where urban middle-class families have embraced online shopping, driven by aggressive marketing, significant sales from e-commerce giants such as Amazon and Flipkart. It's important to note that approximately two-thirds of India's total population continues to dwell in rural areas, which are largely unaffected by modern retail forms (14). Additionally, many people who work from home find it easy to manage work and leisure while conveniently placing orders effortlessly with just a few taps on mobile devices. It seems that even after things return to normal, after the epidemic, internet grocery shopping is here to stay at elevated levels, in comparison. Then there are also particulars that are made available by stores apps, such as information about products, purchaser feedback, and the location of the store (15). These benefits can actually assist a prospective buyer in making a well -informed choice that will eventually lead to a low level of dissonance.

Consumers' growing demand for instant gratification has been a key driver of online grocery business. The expectation of rapid delivery has been set by industry giants and is now becoming a standard across various sectors (16). The world of online shopping is experiencing a new wave of innovation with the rise of OGD. This rapidly growing sector focuses on delivering groceries and essential items to customers within an incredibly short time frame (17). Leading online platforms like Swiggy, Zomato, Flipkart and Amazon are leveraging grocery delivery services.

Evaluation of E-Service Quality Measurement

The theory of service quality measurement originated and developed by Parasuraman, Zeithaml, and Berry, which assessed the gap among customer expectations and perceptions athwart five dimensions: reliability, assurance, tangibles, empathy, and responsiveness (18). As services transitioned to digital platforms, researchers began adapting these models for online environments. Loiacono, Watson, and Goodhue introduced WebQual, focusing on website usability, interactivity, and information quality (19). while Barnes and Vidgen refined it further with WebQual 4.0 (20). To better capture the nuances of online service delivery, Parasuraman, Zeithaml, and Malhotra developed the E-S-QUAL and E-RecS-QUAL scales, measuring factors such as efficiency, system availability, fulfillment, privacy, and service recovery (21). These models have been widely applied and validated across different cultural and industrial contexts, such as in the Indian online retail sector (22). Consequently, these models have been shown to significantly impact customer satisfaction and

loyalty (23). Subsequent introduction of the E-S-QUAL model, Boshoff proposed a revised model comprising six dimensions, expanding on the original four (24). The analysis identified two new factors: speed and reliability, suggesting a more nuanced understanding of e-service quality. Building on this, the e-SELFQUAL framework developed to assess the quality of online self-service experiences (25). Their model consists of four key dimensions: perceived control, service convenience, customer service, and service fulfillment. They demonstrated that this scale effectively predicts customer satisfaction and loyalty, particularly within the context of self-service technologies in online environments. In this research e-SELFQUAL framework utilized to assess the significance of E-service quality.

E-Service Quality and Satisfaction in OGD Service

Research specific to the online grocery sector has identified several unique aspects that influence customer satisfaction. Additionally, emerging challenges such as over-reliance on automated customer service tools like chatbots have been found to negatively impact user satisfaction, especially when the technology fails to resolve customer queries effectively (26). These findings underscore the need for a balanced integration of technological efficiency and human-centered service design. In summary, the literature suggests that e-service quality is a critical determinant of customer satisfaction in both general online shopping and online grocery services. While traditional models offer foundational insights, context-specific adaptations like e-SELFQUAL and modifications to E-S-QUAL provide a more accurate reflection of modern consumer expectations. Continued research is needed to explore these models across diverse markets and technological settings.

Perceived Control

Perceived control, a crucial user experience (UX) factor, refers to users' sense of influence over their interactions with a website. This review examines how website design elements impact perceived control, explores their consequences for user behaviour, and highlights their role in fostering trust and positive user experiences. User interfaces that empower users are crucial. Interactive features like filters put users in control of finding information and personalizing their experience. This user-centric approach translates to benefits for both users and the website. Engaged users browse more content, and empowered users to perceive the website as trustworthy, contributing to favourable perception of the brand (27). Empowering users contributes to an improved user experience while simultaneously fostering the success of the website. Online retailers thrive on empowered users. Research shows that perceived control translates to confident purchases, especially in online grocery shopping where control over product information fosters trust (28). This control extends beyond purchases. Users who feel empowered browse more and return more often, similar to a well-designed store that invites exploration. Furthermore, clear navigation, interactive features, and personalization build trust by prioritizing user needs (29). Imagine a website remembering your preferences—it feels like a personal shopping assistant, fostering trust and loyalty. User control cultivates a user-centric environment that drives sales and long-term engagement.

H1: Perceived control positively influences customer satisfaction toward OGD services

Service Convenience

The emergence of e-commerce and OGD platforms have revolutionized how consumers shop and obtain goods. Convenience has become a key driver of satisfaction and loyalty in this digital landscape. User-friendly websites and apps allow for efficient product discovery and selection (30). Platforms that prioritize convenience can retain customers and minimize churn rates (31). Additionally, segmenting customer bases and tailoring convenience features to specific needs (e.g., express delivery options for busy professionals) can be valuable strategies (32). While convenience is generally positive, some studies highlight drawbacks. For instance, impulse buying might increase due to the ease of online transactions (33).

H2: Service convenience positively influences customer satisfaction toward OGD services

Customer Service

While seemingly straightforward, customer service is a multifaceted concept. A study conceptualized it as a "perceived problem-solving effort" provided by a service provider to address customer needs (34). Service encounters highlighted the significance of interpersonal

relationships between store employees and the concerned customers. Both perspectives acknowledge the crucial role of addressing customer concerns and creating positive interactions. Effective customer service fosters satisfaction by resolving issues promptly, exceeding expectations, and providing helpful interactions (35). Customers once satisfied, they not only purchase products again but also recommend the company to others (36). Effective problem-solving and addressing customer concerns can minimize churn (defection) and retain valuable customers (37). Likewise, excellent customer service builds a positive brand image, attracting new customers and enhancing overall brand perception (38). Managing customer expectations in a fast-paced online environment requires a focus on real-time responses and problem-solving (39). The rise of digital technologies has transformed customer service delivery. Online channels such as Chabot's, email support, and social media platforms provide convenient and accessible communication avenues however, these channels also present challenges (40).

H3: Customer service positively influences customer satisfaction toward OGD services

Service Fulfilment

Service fulfilment, is honouring of a commitment for a promised service to a customer. It forms the backbone of any successful service-oriented business. It bridges the gap between service design and the customer experience, ensuring a smooth transition from aspiration to realization. Accurately capturing and processing customer orders is crucial. This involves efficient data entry, validation, and clear communication regarding order confirmation and expected delivery timelines. Ensuring the availability of necessary resources for service delivery is essential. This may involve physical resources like equipment or virtual resources like server capacity (41). In addition, that efficient resource allocation minimizes delays and service disruptions (42). Customer satisfaction surveys and feedback can provide valuable insights into the customer experience during fulfilment processes. Optimizing services like picking, packing, and shipping processes minimizes errors and expedites product delivery. Delivery options like drones and same-day delivery services offer greater convenience and flexibility for customers. Fulfilling the growing demand for faster delivery times is crucial for remaining competitive (43).

H4: Service fulfilment positively influences customer satisfaction toward OGD services

Customer Satisfaction and Customer Loyalty

The fast progress of e-transactions has raised important questions regarding the level of satisfaction achieved in online dealings. Research indicates that customer satisfaction and loyalty are often higher in the online environment compared to offline settings. This is because the online space offers a broader range of services, including interactive marketing benefits that are generally missing in offline environments (44). Customer satisfaction is imperative in fostering customer loyalty and serves as a key factor for attainment in a viable market. It has long been considered a vital tool for achieving business success.

The Customer's cognitive model explains how customers evaluate products or services leading to satisfaction or dissatisfaction (45). Similar findings are noted in a study that observed the perceptive and emotional components of customer satisfaction (46). Although the term value earlier was referred to as the ratio of cost and benefit, it has significantly enlarged its scope into an integrated approach encompassing social value and gratifying aspects of consumer behaviour. However, a recent study suggested that the emotional aspect of the customer journey also plays a crucial role in repurchase intention (47). Conversely, negative emotions arising from product malfunctions or poor service interactions can lead to customer churn (defection to competitors).

H5: Customer satisfaction has a positive effect on customer loyalty

Methodology

The research article is founded on original data. A standardized questionnaire was utilized, which contained questions about OGD services. The questionnaire was segmented into three sections. The first section focused on the demographic characteristics of the participants, whereas the second part emphasized their perceptions and preferences for grocery delivery services, and the third section focused on e-SELFQUAL dimensions. The questionnaire helped us to better grasp

consumers' needs, tastes and preferences. The questions are referring to grocery service people used, which was the most favoured payment method for purchasing groceries, which factor was considered to be the most significant while placing an order; and what types of uncertainties did individuals encounter when purchasing groceries online? What were the motivating factors to order groceries from an online website, how often did people use an app to buy groceries online, and so on. The e-SELFQUAL scale has been used to assess factors such as perceived control, customer convenience, service quality, service fulfilment, satisfaction, and loyalty. There were 300 people in the sample from different South Indian cities, which helped in analysing the data.

Partial least squares structural equation modelling (PLS-SEM) has been adopted to analyse the data. This tool was selected primarily for two pertinent reasons. Primarily, PLS-SEM emphasizes on forecast, aligning with the aims and objectives of the study. Secondarily, it effectively evaluates complex models and assesses structural models (48). PLS-SEM is particularly suitable in such contexts as it does not require strict assumptions regarding multivariate normality and is effective for theory development and prediction-oriented research. Therefore, PLS-SEM was considered more appropriate than covariance-based SEM for the objectives of this study.

Results

Instrument and Measurement

As shown in Table 1, the sample is predominantly male respondents 75%, with females accounting for 25%. Most respondents fall within the age group of 25–34 years 36%, followed by 18–24 years 30%, 35–44 years 24%, and 45 years and above 10%. In terms of education, a large proportion belongs to the “Other” category 41%, followed by postgraduates 31%, graduates 26%, and a small share with intermediate education 2%. Regarding purchasing behavior, more than half of the respondents make online grocery purchases 1–4 times per month 51%, while 24% purchase 5–10 times, 16% purchase 11–15 times, and 9% purchase more frequently. With respect to online grocery services used, Flipkart Grocery is the most preferred platform 22%, followed by JioMart 16%, Zepto 14%, Amazon Pantry and Blinkit 13% each, Instamart 12%, and other services 10%.

Table 1: Demographic Attributes of the Participants

Variable	Description	%
Gender	Male	75
	Female	25
Age	18 – 24	30
	25 – 34	36
	35 – 44	24
	45 and above	10
Education	Intermediate	2
	Graduates	26
	Post Graduates	31
	Other	41
Average Purchase Frequency (Monthly)	1-4 times	51
	5-10	24
	11-15	16
	>	9
Online Grocery Service Used	Blinkit	13
	Zepto	14
	Flipkart Grocery	22
	Instamart (Swiggy)	12
	Amazon Pantry	13
	Jio Mart	16
	Other	10

Data Analysis

The values of average variance extracted (AVE), composite reliability (CR), and Cronbach's test were used to assess the measurement model's construct validity and item loading as shown in Table 2. Tests are performed to assess the adequacy of the questions in measuring reliability and validity. Reliability relates to the consistency of the questions in the questionnaires, which means that the respondent interprets the questions exactly as intended. Cronbach's alpha scores were utilized to evaluate the constancy of

the responses. These scores measure how reliably a set of questions assesses a specific concept. A score of 0.7 or higher suggests that the items on the scale are reliable and measurable (48). This test is commonly used to assess internal consistency and reliability; recommending a least threshold of 0.60. Therefore, all the variables in this study meet the criteria for internal consistency. Convergent validity is calculated by comparing the AVE values against the 0.50 threshold. The reported AVE values are all above 0.50, thus meeting this criterion. To assess the reliability of individual indicators, the outer loading values for each reflective construct should be greater than 0.70. As demonstrated in Table 2, all the values exceed 0.70, confirming the reliability of the indicators.

Table 2: Loading of the Item Measurement Model, CR, and AVE

Research Construct	Item Description	Item loading	AVE	CR	Cronbach's Alpha
Perceived Control	I know what to expect at each step of ordering grocery online	0.887	0.786	0.917	0.864
	I know how long it takes to complete a transaction	0.893			
	I know what information will be provided on each page	0.979			
Service Convenience	I found the registration process is convenient	0.842	0.632	0.837	0.715
	I found it easy to modify the items in my cart	0.818			
	I found it convenient to update my order	0.720			
Customer Service	Customer service is easy to access	0.880	0.743	0.897	0.828
	Did customer service show sincere interest in solving problems	0.861			
	Customer service is responsive	0.845			
Service Fulfillment	I get what I ordered	0.870	0.752	0.901	0.835
	The order is delivered as promise	0.892			
	The final price reflects the true value	0.839			
Customer Satisfaction	It was the right thing to purchase on the site	0.886	0.743	0.905	0.842
	I have truly enjoyed purchasing from the site	0.871			
	I am satisfied with an online grocery services	0.858			
Customer Loyalty	I will order grocery from this site again	0.780	0.660	0.853	0.743
	I say positive things about this site to other people	0.787			
	I would recommend this site to others	0.868			

Discriminant validity is established when the √AVE for each construct is larger than its correlations by all other constructs. In other words, the AVE should exceed the inter-construct correlations to ensure that each construct is distinct and not overly related to others (49). This criterion is met; as shown in Table 3 so discriminant validity is considered to be established.

Table 3: Discriminate Validity

Research Construct	Customer Loyalty	Customer Service	Perceived Control	Customer Satisfaction	Service Convenience	Service Fulfilment
Customer Loyalty	0.813					
Customer Service	0.450	0.862				
Perceived Control	0.491	0.391	0.886			
Customer Satisfaction	0.668	0.511	0.476	0.872		
Service Convenience	0.452	0.475	0.596	0.503	0.795	
Service Fulfilment	0.579	0.462	0.539	0.739	0.503	0.867

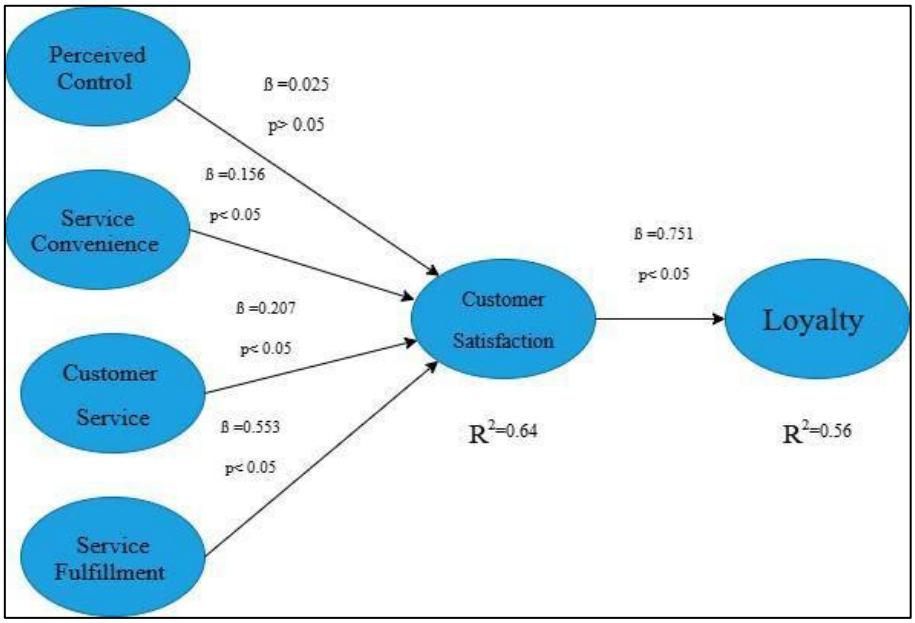

Figure 1: Results of the Tested Model

Structural Model

The model explains 64% of the variance in customer satisfaction (R^2 = 0.64) and 56% of the variance in customer loyalty (R^2 = 0.56). Predictive relevance is supported by Q^2 values of 0.63 for satisfaction and 0.43 for loyalty. Path coefficients were estimated using a bootstrapping procedure with 1000 resamples; standardized beta (β) values and p-values indicate the significance of relationships.

The model was assessed using PLS-SEM technique. It is suggested for researches whose focus on building of theory and prediction (50). This research aims to develop a theoretical framework that predicts satisfaction of customer and loyalty toward online grocery services. The model was tested using SmartPLS 4 as shown in Figure 1. All constructs in the proposed model were specified as reflective. The analysis focused on validating the hypothesized e-SELFQUAL-based framework; therefore, no alternative model specifications were examined. The structural model was evaluated on the basis of collinearity, relationship relevance, significance, accuracy in predicting, R2, and effect size. First, the variance inflation factor was calculated to evaluate the construct collinearity. The variance inflation factors ranged from 1.307 – 2.944, all of which are below the threshold of 5. This suggests that collinearity was not a concern in this model. Second, the model's prediction accuracy was evaluated through the R2 values of the outcome variables. The structural model's evaluation revealed that it explains 64% (R2 = 0.64) of the variation in satisfaction and 56% (R2 = 0.56) of the variance in loyalty. Furthermore, the Q2 values for the endogenous variables (satisfaction = 0.63) and (loyalty = 0.43) suggest a strong degree of predictive relevance. Finally, path coefficients were investigated using a bootstrapping approach with 1000 resamples. The study revealed a significant relationship (β=0.156, $p < 0.05$) between service convenience and satisfaction, supporting Hypothesis 2. Additionally, customer service was establishing a notable positive impact on satisfaction (β=0.207, $p < 0.05$), supporting Hypothesis 3. Service fulfilment and satisfaction have a substantial association (β=0.553, $p < 0.05$), supporting H4. However, the results (β=0.025, $p > 0.05$) of H1 show that the association between perceived control and satisfaction is insignificant; hence, H1 is not supported positively. Hypothesis (H5) revealed a strong significant relationship (β=0.751, $p < 0.05$) between customer satisfaction and loyalty. Given that the relationship between customer satisfaction and customer loyalty is well established in prior literature, Hypothesis H5 is included as a validation hypothesis to confirm the structural integrity of the proposed model. The results of the hypotheses testing shown in Table 4.

Table 4: Summary of Hypotheses Testing

Hypotheses	Path	p Values	Results
H_1 Perceived control → Customer satisfaction	0.025	0.523	Not supported
H_2 Service convenience → Customer satisfaction	0.156	0.012	Supported
H_3 Customer service → Customer satisfaction	0.207	0.000	Supported
H_4 Service fulfillment → Customer satisfaction	0.553	0.000	Supported
H_5 Customer satisfaction → Loyalty	0.751	0.000	Supported

Discussion

This study aims to explore the growing demand of Indian consumers for online – retail grocery shopping. The reason primarily being convenience and wider options as strong determinants for its outstanding success. This paper seeks to emphasize those underlying factors that cause motivation and satisfaction eventually leading to loyalty.

Recent research has shown that perceived control, represented by user interaction with the online environment, enhances user engagement. This has an effect on the emotional responses of customers. Customers feel that they have greater control over their interactions through better and wider choices, ease and convenience, and recovery options – these factors report higher levels of satisfaction in a given situation. However, contrary to expectations, the relationship between perceived control and satisfaction (H1) was found to be insignificant. This result indicates that perceived control, as defined in this study, does not significantly affect customer satisfaction in the context of online grocery shopping. Previous studies have shown mixed results regarding the role of perceived control in customer satisfaction, with some indicating a strong influence, while others find no significant impact. The current study contributes to the debate by showing that, in the online grocery context, factors like service fulfilment and customer service may have a stronger influence on satisfaction than the ability of customers to control the shopping process.

Since service convenience is an important determinant of customer satisfaction, this research indicates that both convenience and access convenience are positively associated with customer satisfaction. This enhances customer loyalty in e-commerce applications. Thus, convenience in online shopping is directly linked to satisfaction and loyalty (51). In addition, website usability, which includes an intuitive design and straightforward navigation, has a relatively substantial influence on customer satisfaction (52). Additional elements that impact customer satisfaction comprise customer service and fulfilment. Improved service quality tops to higher customer satisfaction, which strengthens loyalty, highlighting the critical role of effective customer service in online shopping settings (53). Similar research findings are reported in the present study. The relevant literature indicates that customer service experience significantly impacts customer satisfaction which in turn influences customer loyalty in online grocery shopping (54). E-service quality positively affects satisfaction and loyalty in online platforms, although it does not specifically address online grocery shopping. However, service fulfilment has emerged as a critical factor in boosting satisfaction and reinforcing customer loyalty.

The important part of service fulfilment remains largely about timely deliveries and personalized services that positively contribute to customer satisfaction in the online industry. Effective service fulfilment during and after purchases nurtures loyalty and prompts positive word of mouth, ultimately increasing sales potential (55). Notably, effective after-sale service and flexible responsive order fulfilment relatively improve customer satisfaction in B2C e-commerce in China, prompting customer loyalty and obtaining a loyal e-retailer customer base. Post –purchase services, including fulfilment are critical to customer satisfaction. Although this has not been directly examined, the author suggested that fulfilment significantly shapes overall service worth and satisfaction in the online e-commerce industry (56). Therefore, service fulfilment significantly contributes to customer satisfaction in the online retail sector by ensuring that customer requirements are accurately and consistently met.

Conclusion

The results of this study offer several imperative inferences for practitioners and researchers in the online grocery industry. First, the significant relationships between service convenience, customer service, and service fulfilment with satisfaction suggest that online grocery platforms should focus on enhancing these aspects to improve customer experiences. Ensuring timely delivery, providing user-friendly websites, and offering responsive customer service are critical strategies for increasing customer satisfaction. Second, the lack of a significant relationship between perceived control and satisfaction implies that online grocery platforms need not overly emphasize giving customers complete control over their shopping process. Instead, focusing on operational efficiencies, such as faster delivery and accurate inventory management, may be more impactful for satisfaction in this context. The strong positive relationship between satisfaction and loyalty further emphasizes the importance of focusing on customer satisfaction as a means to build long-term loyalty. Companies in the online grocery sector should invest in loyalty programs, personalized recommendations, and continuous improvements in service quality to foster customer retention. From a theoretical perspective, this study contributes to the understanding e-service quality toward satisfaction and loyalty in the e-commerce domain, specifically online grocery sector. The structural framework provides a useful model for future research in this field and can serve as a basis for analysing other factors with respect to online grocery services.

Abbreviations

AVE: Average Variance Extracted, CR: Composite Reliability, OGD: Online Grocery Delivery, PLS-SEM: Partial least squares structural equation modelling,

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Author Contributions

All authors contributed equally to the conception, design, analysis, and preparation of the manuscript.

Conflict of Interest

The authors declare no conflict of interest in this study.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Artificial Intelligence (AI) Assistance

AI tools were used only for language editing, formatting, and improving clarity. All intellectual content, analysis, and conclusions are the authors own.

Ethics Approval

Not Applicable.

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