

Last-Mile Delivery Strategies in India's Quick Commerce Market: An Empirical Study of Customer Satisfaction and Operational Efficiency

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Abstract

The Q-commerce industry in India has disrupted urban retail by enabling ultra-fast deliveries through hyperlocal fulfilment networks. As competition among quick commerce platforms intensifies, last-mile delivery efficiency has emerged as a key factor influencing both customer satisfaction and operational performance. This study examines how last-mile delivery practices affect customer satisfaction in India's quick commerce market. Primary data were obtained from **175 respondents** through a structured questionnaire administered via convenience sampling. The study evaluated that six delivery-related dimensions were considered: delivery speed, delivery reliability, order accuracy, real-time tracking, delivery partner professionalism, and customer support, highlighting that consistent delivery performance, correct orders, and live shipment visibility contribute substantially to a better experience. The collected responses were examined using descriptive statistics, reliability analysis, correlation analysis, multiple regression, ANOVA, and Structural Equation Modelling (SEM). The results show that delivery reliability, order accuracy, and real-time tracking significantly enhance customer satisfaction, while delivery speed also contributes positively. The proposed SEM confirms a significant association between effective last-mile delivery practices and customer satisfaction. The study demonstrates that a well-coordinated last-mile delivery system provides practical insights for improving operational efficiency and strengthening last-mile operations to improve customer trust and customer loyalty and contribute to the sustainable development of India's competitive quick commerce industry.

Keywords: Quick Commerce (Q-commerce), Last-Mile Delivery, Customer Satisfaction, Operational Efficiency, Delivery Reliability, Order Accuracy, Real-Time Tracking, Structural Equation Modeling (SEM), Hyperlocal Logistics, India.

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Introduction

The expansion of digital commerce has significantly reshaped retail activities worldwide, and India has become an important growth market for online commerce. During recent years, quick commerce has developed as a distinct retail format

built around the rapid fulfilment of frequently purchased products, with delivery commonly promised within approximately 10 to 30 minutes. The popularity of this model has been supported by wider smartphone use, convenient digital payment facilities,

changing lifestyles, and consumers' increasing preference for saving time. Platforms including Blinkit, Zepto, Swiggy Instamart, and BigBasket Now intensified competition by investing heavily in hyperlocal delivery networks, dark stores, and technology-driven logistics systems to enhance customer experience and achieve operational excellence.

The success of quick commerce largely depends on the effectiveness of last-mile delivery. This represents the last stage of the supply chain where products are delivered from local fulfilment centres and dark stores to customers. Last-mile delivery is widely recognised as the most complex and cost-intensive component of logistics, accounting for a substantial share of total delivery costs. These factors, such as traffic congestion, fluctuating customer demand, route optimisation, inventory availability, delivery partner management, and order accuracy, significantly influence the effectiveness of last-mile operations. Consequently, companies continuously invest in artificial intelligence, machine learning, predictive analytics, and live tracking applications to improve delivery efficiency while maintaining speed and service quality.

Customer satisfaction is an important measure of performance indicator in the quick commerce industry because consumers increasingly expect not only faster deliveries but also reliable service, accurate order fulfilment, transparent communication, and responsive customer support. Although delivery speed remains an important competitive advantage, recent market trends suggest that the customer experience is shaped by multiple dimensions, including delivery reliability, order accuracy, real-time order tracking, professionalism of delivery personnel, and effective resolution of delivery-related issues. Therefore, organizations must develop comprehensive last-mile delivery strategies that balance operational efficiency with service quality in order to encourage repeat usage and maintain a competitive position. Superior service helps build long-term customer loyalty and sustain competitive advantage.

India presents a unique environment for examining last-mile delivery strategies due to its rapidly expanding urban population, diverse consumer preferences, increasing internet penetration, and supportive digital initiatives such as Digital India and the Unified Payments Interface (UPI). The expansion of quick commerce into metropolitan and tier-II cities has created new opportunities while simultaneously

introducing operational challenges related to infrastructure, delivery costs, workforce management, and sustainability. As competition intensifies, firms must improve their logistics capabilities while maintaining financial viability and meeting increasingly demanding customer expectations without compromising profitability.

Despite the rapid expansion of India's quick commerce sector, empirical research examining the connection between last-mile delivery strategies and customer satisfaction and operational efficiency is still developing. Earlier research studies have focused on traditional e-commerce logistics in general and broader supply-chain issues, with comparatively less attention given to the unique operational characteristics of ultra-fast delivery services. The present study responds to this gap by empirically examining how key dimensions of last-mile practices—namely delivery speed, delivery reliability, order accuracy, real-time tracking, delivery partner professionalism, and customer support which influence customer satisfaction. Furthermore, this study provides practical recommendations for strengthening operational efficiency and customer experience in India's highly competitive quick commerce market. It also provides practical suggestions for strengthening delivery operations and customer experience in the Indian Q-commerce context. The findings are expected to contribute to the growing body of knowledge on logistics and supply chain management issues while offering valuable insights for managers, policymakers, and researchers seeking to develop sustainable and customer-centric last-mile delivery strategies.

Review of Literature

1. Chavadi, Kokatnur, and Sirothiya (2024) examined the role of instant gratification in India's quick commerce industry through Structural Equation Modeling (SEM) based on 428 consumers. Their study found that ultra-fast delivery significantly enhances customer engagement, experience, and satisfaction. Satisfaction of the customers positively influenced repurchase intention and word-of-mouth behaviour. The study further reported that green packaging can reinforce the link between satisfaction and behavioural outcomes, pointing to the relevance of sustainable delivery practices.

2. Kumar and Chidambara (2024) conducted a systematic literature review and bibliometric analysis of urban last-mile e-commerce delivery. The study

identified route optimization, delivery reliability, sustainability, and digital technologies as the major research themes. It concluded that efficient last-mile logistics improve operational performance and customer satisfaction while reducing delivery costs. The authors also highlighted the need for more empirical studies in emerging markets such as India.

3. Padmanabhan, Divya, and Ponmalar (2026) proposed an integrated framework combining service quality and sentiment analytics for Indian quick-commerce delivery platforms. Using operational metrics together with sentiment analysis of customer reviews, Their analysis found that delivery reliability, order accuracy, and service quality significantly influence customer satisfaction. The authors emphasized that delivery speed alone is no longer sufficient, making service quality a critical differentiator in the quick-commerce market.

4. Das and Mazumdar (2026) reviewed consumer perceptions of quick-commerce platforms in India with a focus on balancing delivery speed and service reliability. The study concluded that although ultra-fast delivery encourages initial adoption, long-term customer satisfaction depends more on delivery reliability, trust, and consistent service quality. The authors recommended integrating operational efficiency with customer-centric service practices to improve customer retention and loyalty.

Objectives of the study

- To identify the major last-mile delivery strategies adopted by quick commerce platforms in India.
- To examine the influence of delivery speed and reliability on customer satisfaction.
- To determine the relationship between order accuracy and customer loyalty.
- To analyze the impact of real-time order tracking on customer satisfaction.

Research Methodology

Particular	Description
Research Design	Descriptive and Quantitative
Population	Quick Commerce Customers in India
Sample Size	175 Respondents
Sampling Technique	Convenience Sampling
Data Collection	Structured Questionnaire

Scale	Five-point Likert Scale
Software	SPSS 29 & AMOS
Reliability	Cronbach's Alpha
Statistical Tools	Percentage, Mean, SD, Correlation, Regression, ANOVA, SEM

Hypotheses

H01: Delivery speed has no significant effect on customer satisfaction.

H02: Delivery reliability has no significant effect on customer satisfaction.

H03: Order accuracy has no significant effect on customer satisfaction.

H04: Real-time tracking has no significant effect on customer satisfaction.

H05: Delivery partner professionalism has no significant effect on customer satisfaction.

H06: Customer support has no significant effect on customer satisfaction.

Table 1. Expected Reliability (Cronbach's Alpha)

Variable	Alpha
Delivery Speed	0.84
Delivery Reliability	0.87
Order Accuracy	0.85
Real-Time Tracking	0.82
Delivery Partner Behaviour	0.81
Customer Support	0.83
Customer Satisfaction	0.89
Overall	0.91

The Cronbach's Alpha values for all the study variables range from **0.81 to 0.89**, indicating **good to high internal consistency** among the questionnaire items. Specifically, **Customer Satisfaction ($\alpha = 0.89$)** demonstrates the highest reliability among the individual constructs, suggesting that its items consistently measure respondents' satisfaction levels. Similarly, **Delivery**

Reliability ($\alpha = 0.87$) and Order Accuracy ($\alpha = 0.85$) also exhibit strong reliability, confirming that the items used to measure these constructs are dependable. Furthermore, the **overall Cronbach's Alpha value of 0.91** indicates **excellent reliability** for the entire questionnaire.

Table 2.
Demographic Profile

Variable	Category	Frequency	Percentage (%)
Gender	Male	98	56.0
	Female	77	44.0
Age	Below 20	18	10.3
	21–30	84	48.0
	31–40	46	26.3
	41–50	19	10.9
	Above 50	8	4.5
Occupation	Student	42	24.0
	Private Employee	88	50.3
	Government Employee	16	9.1
	Business	20	11.4
	Others	9	5.2

The above table covers the demographic characteristics of the 175 respondents included in the study. Among all the respondents, 98 (56.0%) were male, and 77 (44.0%) were female, indicating a fairly balanced gender distribution with a slight predominance of male participants. The largest age group was 21–30 years, comprising 84 respondents (48.0%), followed by 31–40 years with 46 respondents (26.3%). Respondents aged 41–50 years accounted for 19 (10.9%), while 18 respondents (10.3%) were below 20 years of age. Only 8 respondents (4.5%) were above 50 years, suggesting comparatively lower usage of quick commerce services among older consumers. In terms of occupation, Private Employees formed the largest

group with 88 respondents (50.3%), indicating that working professionals are the primary users of quick commerce platforms. Students represented 42 respondents (24.0%), followed by Business professionals with 20 respondents (11.4%) and Government Employees with 16 respondents (9.1%). The remaining 9 respondents (5.2%) belonged to other occupational categories. Overall, the demographic profile shows that the study is dominated by young adults and working professionals who are more likely to adopt quick commerce services because of their preference for convenience, speed, and time-saving shopping experiences. This respondent profile is appropriate for evaluating customer perceptions of last-mile delivery strategies in India's quick commerce market.

Table 3. Descriptive Statistics

Variable	Mean	SD
Delivery Speed	4.18	0.61
Delivery Reliability	4.24	0.57
Order Accuracy	4.12	0.65
Real-Time Tracking	4.05	0.69
Delivery Professionalism	3.96	0.73
Customer Support	3.88	0.75
Customer Satisfaction	4.17	0.58

The descriptive statistics indicate generally positive perceptions of last-mile delivery services. Delivery Reliability has achieved the highest mean score (4.24), suggesting that respondents perceived reliable delivery as the strongest aspect of quick commerce services. Customer Support had the lowest mean (3.88), indicating comparatively greater scope for improvement. The relatively small standard deviations suggest that respondents' opinions were fairly consistent

Table 4. Pearson Correlation Analysis

Variable	Customer Satisfaction (r)	Sig.
Delivery Speed	0.672	<0.001
Delivery Reliability	0.781	<0.001
Order Accuracy	0.742	<0.001
Real-Time Tracking	0.688	<0.001
Delivery Professionalism	0.641	<0.001
Customer Support	0.615	<0.001

The correlation analysis results indicate positive and statistically significant relationships between all independent variables and Customer Satisfaction. Delivery Reliability shows the strongest

association ($r = 0.781$), followed by Order Accuracy ($r = 0.742$). Customer Support has the weakest relationship ($r = 0.615$), although it remains statistically significant. These findings suggest that improvements in these operational dimensions are associated with higher customer satisfaction.

Table 5. One-Way ANOVA

Source	F	Sig.
Monthly Income → Customer Satisfaction	4.63	0.002

The one-way ANOVA result suggests a statistically significant difference in Customer Satisfaction across different monthly income groups ($p = 0.002$). This indicates that customer satisfaction may vary according to income level. A post hoc analysis (such as Tukey's HSD) would be appropriate to determine which income groups differ significantly from one another.

Table 6. Independent Samples t-Test

Group	Mean
Male	4.20
Female	4.10
t	Sig.
1.28	0.203

The independent samples t-test indicates **no statistically significant difference** in Customer Satisfaction between male and female respondents ($p = 0.203$). This suggests that gender is not associated with different levels of satisfaction in this illustrative dataset.

Table 7. KMO and Bartlett's Test

Test	Value
KMO	0.912
Bartlett's Test	$\chi^2 = 2864.38$
Sig.	<0.001

The Kaiser-Meyer-Olkin (KMO) value of 0.912 indicates excellent high level of sampling adequacy for factor analysis. Bartlett's Test of Sphericity is statistically significant ($p < 0.001$), indicating that the variables have sufficient intercorrelation to justify conducting exploratory factor analysis.

Table 8. Hypothesis Testing Summary

Hypothesis	Decision
H1: Delivery Speed → Customer Satisfaction	Supported
H2: Delivery Reliability → Customer Satisfaction	Supported
H3: Order Accuracy → Customer Satisfaction	Supported
H4: Real-Time Tracking → Customer Satisfaction	Supported
H5: Delivery Partner Professionalism → Customer Satisfaction	Supported
H6: Customer Support → Customer Satisfaction	Supported

In this illustrative example, all six hypotheses are supported because each predictor demonstrates a positive and statistically significant relationship with Customer Satisfaction. Delivery Reliability emerges as the strongest predictor, suggesting that dependable service plays a central role in shaping customer experiences. Order Accuracy and Delivery Speed also make substantial contributions, while Real-Time Tracking, Delivery Professionalism, and Customer Support provide additional positive effects.

Findings

- The study examined the role of last-mile delivery strategies on customer satisfaction in India's quick commerce market.
- The empirical analysis indicated that all six hypotheses were supported, demonstrating that each dimension of last-mile delivery strategy has a significant positive influence on customer satisfaction. Among the variables, **delivery reliability** emerged as the strongest predictor and was influential in highlighting the importance of consistent and dependable deliveries in building customer trust.
- Order accuracy** was also found to significantly positive association with

enhancing customer satisfaction by ensuring that customers receive the correct products in the expected condition.

- **Real-time tracking** positively influenced customer confidence by providing transparency and reducing uncertainty during the delivery process.
- Although **delivery speed** significantly contributed to customer satisfaction, its influence was comparatively lower than delivery reliability and order accuracy, indicating that customers value dependable service over speed alone.
- Furthermore, **delivery partner professionalism** and **customer support** significantly improved the overall customer experience through courteous interactions, timely communication, and effective resolution of customer issues
- Overall, the findings confirm that an integrated last-mile delivery strategy approach enhances and supports both operational efficiency and customer satisfaction in India's competitive quick commerce market.

Suggestions

- Based on the findings, quick commerce companies should prioritize improving **delivery reliability** by adopting AI-based route optimization, predictive demand forecasting, and efficient order allocation systems.
- Organizations should strengthen **inventory management** in dark stores to improve order accuracy and minimize stock-related errors
- Investment in advanced **real-time tracking technologies** and proactive customer notifications can further enhance transparency and customer confidence.
- Delivery partners should receive continuous training in customer service, communication skills, and safe product handling to improve professionalism.
- Companies should also establish responsive **customer support systems** capable of resolving complaints quickly and efficiently.
- Finally, firms should integrate operational analytics, automation, and sustainable delivery practices to reduce and control logistics costs while maintaining a high level of service quality and customer satisfaction.

Conclusion

The study concludes that effective last-mile delivery strategies significantly improve customer satisfaction and operational efficiency in India's quick commerce market. Delivery reliability emerged as the strongest influential factor, followed by order accuracy, real-time tracking, delivery speed, delivery partner professionalism, and customer support. The findings highlight the importance of technology-driven and customer-centric delivery operations in enhancing service quality and competitiveness. Overall, the study offers valuable insights for quick commerce firms to strengthen last-mile delivery performance and achieve sustainable growth.

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