



Challenges In Last-Mile Delivery Logistics For E-Commerce Companies

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Abstract

The rapid growth of e-commerce has transformed consumer purchasing behavior and increased demand for fast, reliable, and cost-effective delivery services. Among the various stages of the logistics process, last-mile delivery is considered the most complex and expensive. It directly impacts customer satisfaction and operational efficiency. E-commerce companies face numerous challenges in last-mile delivery, including rising transportation costs, traffic congestion, inaccurate addresses, failed deliveries, labor shortages, and sustainability concerns. This study aims to analyze the key challenges faced by e-commerce companies in last-mile delivery logistics and examine customer perceptions regarding delivery performance. The research adopts a descriptive research design using primary data collected through a structured questionnaire. Data analysis is performed using percentage analysis, tables, and charts. The findings highlight that delivery delays, high costs, and poor infrastructure are major obstacles. The study concludes with practical suggestions to improve last-mile delivery efficiency through technology adoption and better logistics planning.

Keywords: Last-Mile Delivery, E-Commerce Logistics, Supply Chain Management, Customer Satisfaction, Urban Logistics

1. Introduction

The emergence of e-commerce has significantly changed the traditional retail landscape by offering convenience, wider product choices, and competitive pricing. With the increase in online shopping, logistics has become a critical success factor for e-commerce companies. Among all logistics activities, last-mile delivery plays a vital role as it represents the final stage of delivering products from distribution centers to customers.

Last-mile delivery accounts for a major portion of logistics costs and operational complexity. Customers expect faster deliveries, real-time tracking, and flexible delivery options. However, e-commerce

companies face multiple challenges such as traffic congestion, high fuel costs, limited delivery windows, and frequent delivery failures. These challenges are more prominent in densely populated urban areas as well as remote rural locations.

Efficient last-mile delivery not only reduces costs but also enhances customer satisfaction and brand loyalty. Therefore, understanding the challenges associated with last-mile delivery is essential for e-commerce companies to design effective logistics strategies.

2. Review of Literature

Several studies have highlighted the importance of last-mile delivery in e-commerce logistics. According to Gevaers et al. (2014), last-mile delivery is the most expensive and least efficient part of the supply chain. The authors emphasized the need for innovative delivery models to reduce costs.

Hübner, Kuhn, and Wollenburg (2016) identified customer expectations such as same-day delivery and flexible delivery locations as major challenges for logistics service providers. Their study revealed that meeting these expectations significantly increases operational complexity.

Boysen et al. (2021) discussed the impact of urbanization on last-mile logistics and stated that traffic congestion and environmental regulations pose serious constraints. They suggested the use of micro-fulfilment centers and electric vehicles.

Recent studies also emphasize the role of technology such as route optimization, AI-based demand forecasting, and real-time tracking systems to overcome last-mile challenges. However, high implementation costs and lack of skilled manpower remain barriers.

The review indicates a research gap in understanding customer perceptions of last-mile delivery challenges in the Indian e-commerce context, which this study attempts to address.

3. Objectives of the Study

1. To identify the major challenges faced by e-commerce companies in last-mile delivery logistics.
2. To analyze customer perceptions regarding last-mile delivery performance.
3. To study the impact of delivery challenges on customer satisfaction.
4. To suggest measures for improving last-mile delivery efficiency.

4. Limitations of the Study

- The study is limited to a small sample size.
- Responses are based on customer perceptions, which may be subjective.
- Time constraints restricted extensive data collection.
- The study focuses mainly on urban consumers.

5. Research Methodology

5.1 Research Design

The study adopts a **descriptive research design** to analyze the challenges in last-mile delivery logistics faced by e-commerce companies.

5.2 Source of Data

- **Primary Data:**

Collected through a structured questionnaire.

- **Secondary Data:**

Collected from journals, books, websites, and research articles.

5.3 Sample Size

The sample size for the study is **100 respondents** who regularly use e-commerce platforms.

5.4 Sampling Technique

Convenience sampling method was used to collect data from respondents.

5.5 Tools for Analysis

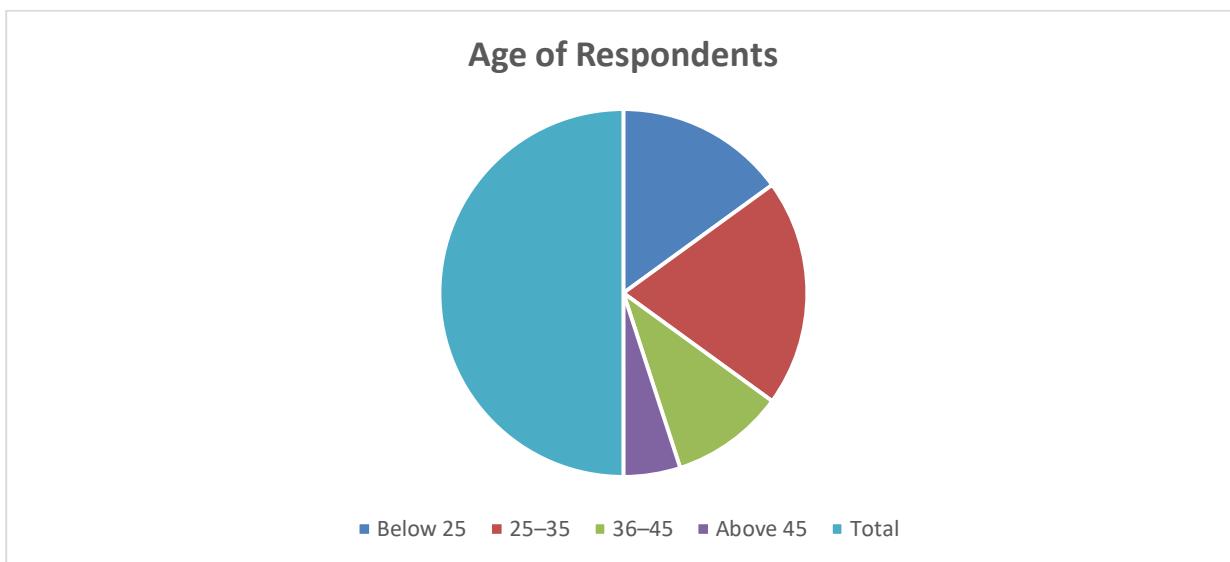
- Percentage analysis
- Tables
- Charts (bar and pie charts)

6. Data Analysis and Interpretation

Table 1: Age of Respondents

Age Group	No. of Respondents	Percentage
Below 25	30	30%
25–35	40	40%
36–45	20	20%
Above 45	10	10%
Total	100	100%

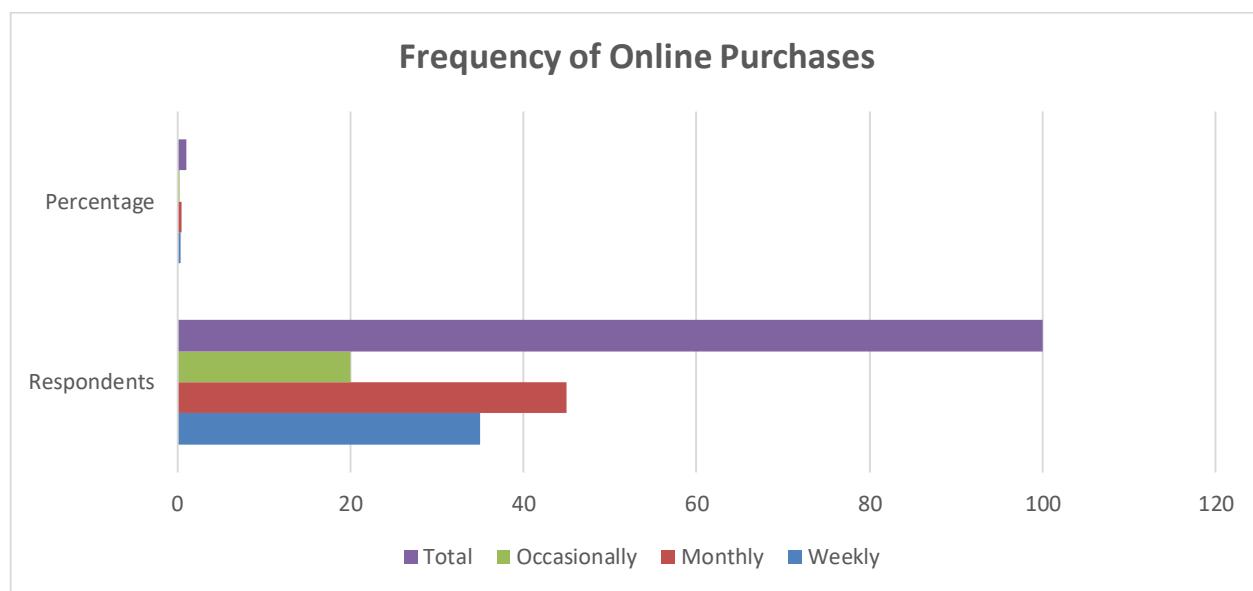
Chart 1: Age of Respondents

**Interpretation:**

Majority (40%) of respondents belong to the 25–35 age group.

Table 2: Frequency of Online Purchases

Frequency	Respondents	Percentage
Weekly	35	35%
Monthly	45	45%
Occasionally	20	20%
Total	100	100%

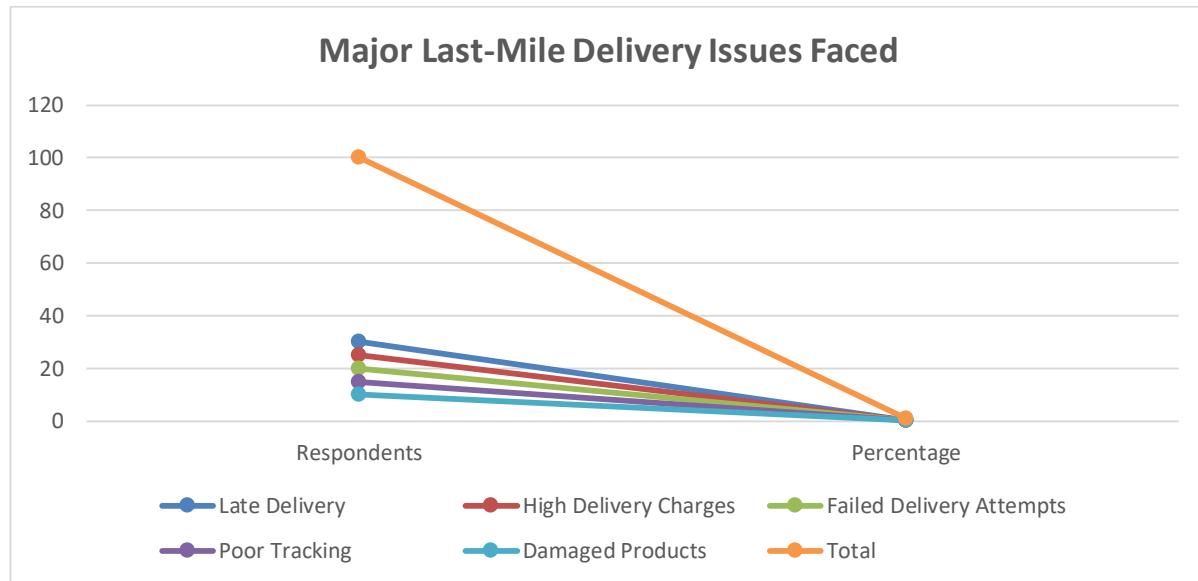
Chart 2: Frequency of Online Purchases**Interpretation:**

45% of respondents shop online monthly.

Table 3: Major Last-Mile Delivery Issues Faced

Issues	Respondents	Percentage
Late Delivery	30	30%
High Delivery Charges	25	25%
Failed Delivery Attempts	20	20%
Poor Tracking	15	15%
Damaged Products	10	10%
Total	100	100%

Chart 3: Major Last-Mile Delivery Issues Faced

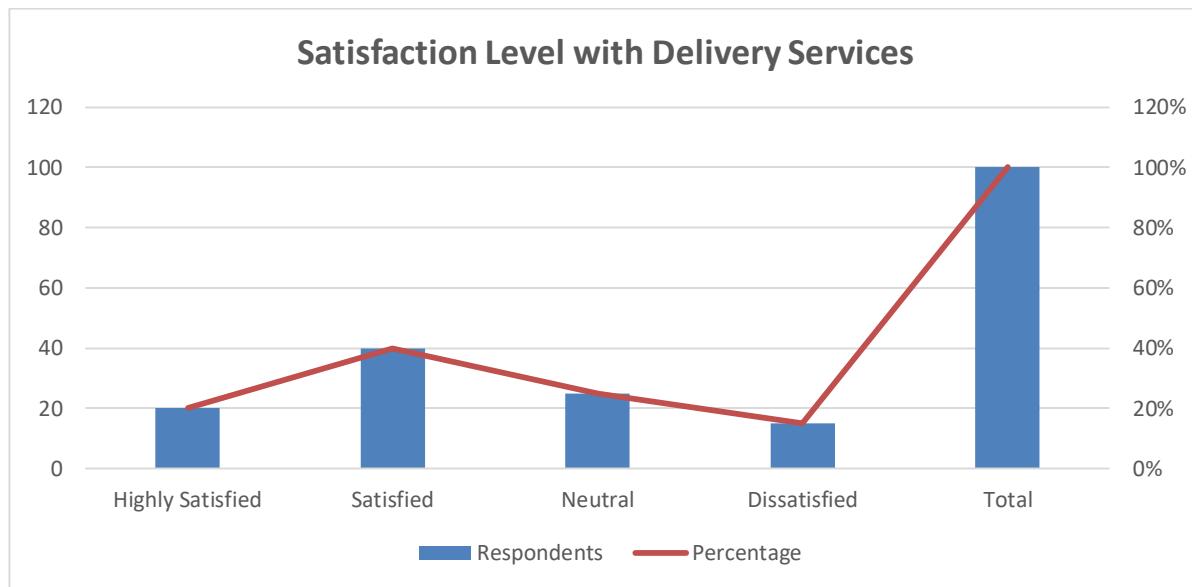
**Interpretation:**

Late delivery is the most common issue faced by customers.

Table 4: Satisfaction Level with Delivery Services

Satisfaction Level	Respondents	Percentage
Highly Satisfied	20	20%
Satisfied	40	40%
Neutral	25	25%
Dissatisfied	15	15%
Total	100	100%

Chart 4: Satisfaction Level with Delivery Services

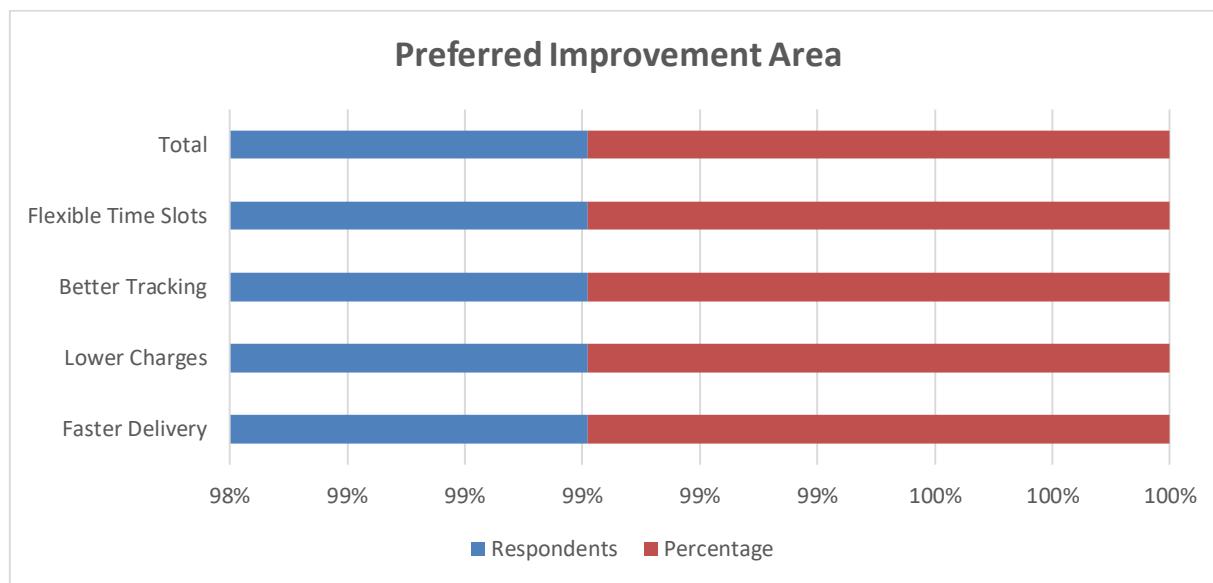
**Interpretation:**

Majority (60%) of respondents are satisfied with delivery services.

Table 5: Preferred Improvement Area

Area	Respondents	Percentage
Faster Delivery	35	35%
Lower Charges	30	30%
Better Tracking	20	20%
Flexible Time Slots	15	15%
Total	100	100%

Chart 5: Preferred Improvement Area



Interpretation:

Faster delivery is the most preferred improvement area.

7. Findings of the Study

- Last-mile delivery delays are the primary challenge faced by customers.
- High delivery charges negatively impact customer satisfaction.
- Majority of customers prefer faster and flexible delivery options.
- Tracking transparency plays a crucial role in customer trust.
- Urban traffic congestion significantly affects delivery efficiency.

8. Suggestions

- Adoption of AI-based route optimization systems.
- Use of micro-warehouses closer to customers.
- Introduction of flexible delivery time slots.
- Investment in electric vehicles for sustainable delivery.
- Improved coordination between delivery partners and customers.

9. Conclusion

Last-mile delivery is a critical component of e-commerce logistics that directly influences customer satisfaction and operational costs. The study reveals that challenges such as late deliveries, high costs, and infrastructure issues continue to hinder efficient last-mile operations. Addressing these challenges requires a combination of technological innovation, strategic planning, and customer-centric approaches. By improving last-mile delivery efficiency, e-commerce companies can gain a competitive advantage and enhance long-term customer loyalty.

10. References

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