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A Study on Last-Mile Delivery Challenges in E-Commerce Logistics: A Customer's Perspective

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Abstract: ***Last Mile delivery plays a crucial role in the success of E-Commerce logistics, as it represents the final point of interaction between the company and the customer. Despite technological advancements, customers continue to face several challenges during the last mile delivery process, which directly influence satisfaction, trust and repeat purchase intentions. This study aims to identify the major challenges experienced by customers in last mile delivery and to evaluate their expectations and preferences regarding delivery options in E-Commerce logistics. The research adopts a customer centric approach and highlights issues such as delayed deliveries, failed delivery attempts, lack of real-time tracking, high delivery charges and poor communication. The findings of the study are expected to provide insights for E-Commerce companies to improve delivery efficiency, enhance customer satisfaction, and strengthen their competitive position in the market.***
Keywords: ***Last-Mile delivery, E-Commerce logistics, customer satisfaction, delivery challenges, customer expectations.***

I. INTRODUCTION

The rapid growth of e-commerce has significantly transformed the buying behavior of customers by providing convenience, wider product choices, and easy access to goods and services. With the increasing dependence on online shopping platforms, logistics has become a vital component in ensuring efficient order fulfillment. Among the various stages of the logistics process, last mile delivery is considered the most crucial, as it represents the final stage where products are delivered from warehouses or distribution centers directly to customers. This stage plays a major role in determining customer satisfaction and overall service quality. Last mile delivery, though covering a short physical distance, involves several operational challenges such as traffic congestion, inaccurate delivery addresses, customer unavailability, and poor coordination. From a customer's perspective, issues like delayed delivery, lack of real-time tracking, high delivery charges, and ineffective communication often result in dissatisfaction. As competition among e-commerce companies intensifies, customer expectations for faster, flexible, and reliable delivery services continue to rise. Therefore, understanding last mile delivery challenges and customer expectations is essential for e-commerce firms to improve delivery efficiency and enhance customer satisfaction.

A. Objectives

- To identify the key challenges faced by the customers during the last - mile delivery in E – Commerce logistics.
- To evaluate customer expectations & preferences related to last - mile delivery options.

II. CONCEPT OF LAST MILE DELIVERY IN E - COMMERCE

Last mile delivery is the final stage of the logistics process where products are delivered directly to customers. It is considered the most expensive and time-consuming part of the supply chain due to fragmented delivery locations, high delivery frequency, and rising customer service expectations. In e-commerce, last mile delivery includes activities such as order confirmation, shipment tracking, doorstep delivery, and handling of returns and exchanges. Since this stage represents the final interaction between the customer and the company, it plays a crucial role in shaping customer satisfaction and overall shopping experience. Efficient last mile delivery helps e-commerce companies ensure timely delivery, improve reliability, and build customer trust. The use of technology such as GPS tracking, delivery notifications, and optimized route planning has further strengthened last mile operations. However, inefficiencies such as delayed delivery, poor communication, and failed delivery attempts can lead to negative reviews, order cancellations, and loss of brand loyalty. Therefore, effective management of last mile delivery is essential for e-commerce firms to remain competitive and meet evolving customer expectations.

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III. CHALLENGES FACED BY CUSTOMERS IN LAST MILE DELIVERY

Customers face several challenges during the last mile delivery process in e-commerce logistics, with delayed delivery being one of the most common issues. Delays often occur due to traffic congestion, poor route planning, high order volumes, and inefficient coordination between warehouses and delivery personnel. Failed delivery attempts are another major problem, usually caused by customer unavailability, incorrect delivery addresses, or lack of prior communication. Such issues lead to inconvenience, repeated delivery attempts, and dissatisfaction among customers, especially when urgent or time-sensitive orders are involved. Inadequate updates regarding delivery status create uncertainty and frustration, reducing trust in e-commerce platforms. High delivery charges, particularly for same-day or express delivery, also negatively influence customer satisfaction and purchase decisions. Additionally, problems such as damaged products, unprofessional behaviour of delivery personnel, and complicated return or exchange processes further impact the overall delivery experience. These challenges highlight the need for customer-focused last mile delivery strategies to improve service quality and ensure a positive e-commerce experience.

IV. CUSTOMER EXPECTATIONS AND PREFERENCES IN LAST-MILE DELIVERY

Customers expect last mile delivery services to be fast, reliable, and timely, as delivery performance strongly influences their overall e-commerce experience. On-time delivery within the promised timeframe is one of the primary expectations, especially for essential and time-sensitive products. Customers also prefer accurate and real-time tracking facilities that provide regular updates on order status, as this enhances transparency and reduces uncertainty. In addition to speed and reliability, customers increasingly prefer flexible and convenient delivery options. Features such as selecting preferred delivery time slots, alternate delivery locations, and contactless delivery have gained importance, particularly in urban areas. Affordable or free delivery is another major preference, as high delivery charges can discourage repeat purchases. Meeting these expectations enables e-commerce companies to enhance customer satisfaction, loyalty, and long-term competitiveness.

V. DATA ANALYSIS

1) Objective 1: To Identify The Key Challenges Faced By Customers During Last-Mile Delivery In E-Commerce Logistics

Friedman Rank Test

FACTORS	MEAN RANK	RANK	N	CHI-SQUARE	DF	ASYMP-SIG
Delivery delays	3.70	3	150	266.32	7	.000
Incorrect product	5.54	7				
Package damage	4.26	4				
Poor communication	3.01	2				
Payment/OTP issues	2.93	1				
High delivery charges	4.81	5				
Incorrect delivery address	6.28	8				
Unavailability of customer support	5.47	6				

Interpretation

The Friedman Rank Test was used to analyze the challenges faced by customers. The test result shows a Chi-Square value of 266.32, df = 7, and Asymp.sig = .000, which is less than 0.05. hence, there is a significant difference among the challenges faced by customers.

Based on mean ranks, incorrect delivery address (6.28) is the most common challenge, followed by incorrect product and unavailability of customer support. Payment issues have the lowest mean rank, indicating it is the least faced problem.

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2) Objective 2: To Evaluate Customer Expectations And Preferences Related To Last-Mile Delivery Options

Table Shows The Delivery Option Based On Customers Preference

CLASSIFICATION	NUMBER OF RESPONDENTS	PERCENTAGE
Same day delivery	31	20.7
Scheduled delivery slot	40	26.7
Standard delivery	24	16.0
Eco-friendly delivery	26	17.3
Express delivery	29	19.3
Total	150	100.0

Interpretation

The table shows delivery options based on customer preference. Among 150 respondents, 20.7 per cent preferred same-day delivery, 26.7 per cent preferred scheduled delivery slots, 16.0 per cent preferred standard delivery, 17.3 per cent preferred eco-friendly delivery and remaining 19.3 per cent preferred express delivery.

Most of the respondents preferred scheduled delivery slots.

3) Chi Square

Relationship Between Age Of The Respondents And Technology Recommended To Improve Last Mile Delivery

Age	Technology recommended by customer's to improve last-mile delivery					Total	P	SIG	S/NS
	GPS tracking	Drone delivery	Smart delivery lockers	Autonomous robots for short distance	Electric delivery vehicle				
Below 20	7	4	2	5	5	23	17.15	0.144	NS
20 – 30	24	31	19	6	15	95			
30 – 40	5	4	6	6	5	26			
Above 40	1	1	3	0	1	6			
Total	37	40	30	17	26	150			

4) Hypothesis

- Null Hypothesis (H_0): There is no significant relationship between Age and Technology recommended to improve last mile delivery.
- Alternative Hypothesis (H_1): There is a significant relationship between Age and Technology recommended to improve last mile delivery.

VI. INTERPRETATION

The above table shows the relationship between age of the respondents and the type of technology recommended to improve last-mile delivery. Out of 150 respondents 31 have recommended drone delivery technology to improve last-mile delivery.

It is clear from the table that there is no significant relationship (P = 17.15, Sig = 0.144) between age of the respondents and the type of technology recommended to improve last-mile delivery. As the significant value is more than 0.05 it shows that there is no significant relationship between the age of the respondents and the type of technology recommended to improve last-mile delivery.

Hence the null hypothesis is accepted.

VII. FINDINGS

1) Friedman Rank Test reveals significant differences among the challenges faced by customers, with incorrect address and incorrect product delivery ranked as major issues.

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2) Incorrect delivery updates create confusion and dissatisfaction among customers.
3) Customers prefer scheduled delivery slots over other delivery options.
4) Same-day and express delivery options are also preferred by a considerable number of respondents.

VIII. SUGGESTIONS

1) Improve real-time tracking and delivery notifications to reduce uncertainty and delays faced by customers.
2) Provide flexible delivery time slots so customers can choose delivery timings according to their convenience
3) Adopt technology-based delivery solutions such as mobile app, SMS alerts and digital proof of delivery to meet customer expectations
4) Strengthen the customer support system to resolve delivery related issues quickly and improve customer satisfaction.

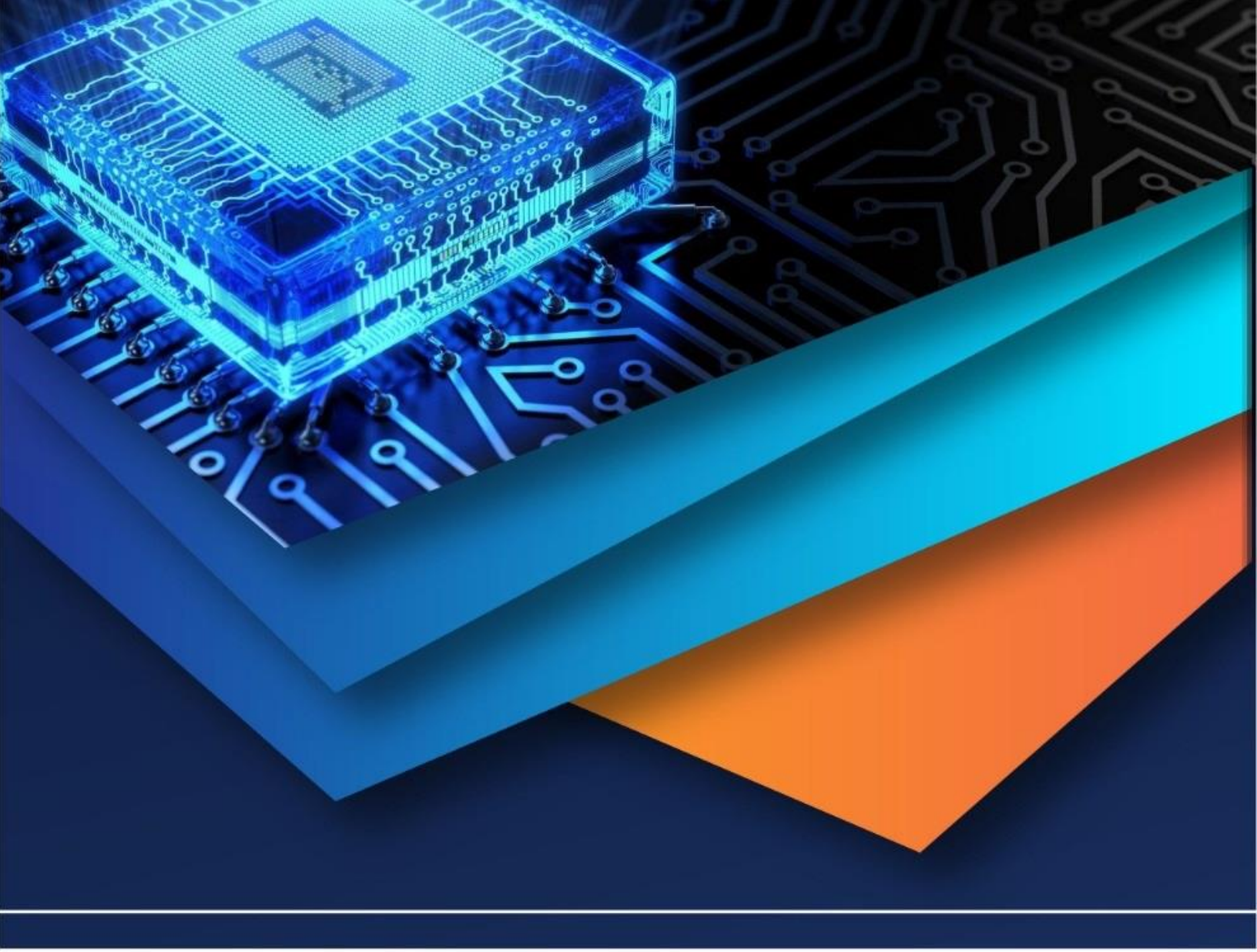
IX. CONCLUSION

The study concluded that last mile delivery plays a crucial role in determining overall customer satisfaction. Customers face several challenges such as delivery delays, lack of real-time information, and limited communication during the delivery process. At the same time, the findings reveal that customers increasingly expect technology driven solutions, flexible delivery options and reliable service in last mile delivery. Understanding customer expectations and preferences helps logistics companies design efficient delivery strategies and improve service quality. Therefore, adopting advanced technology, enhancing customer support, and addressing key delivery challenges can significantly improve customer satisfaction and strengthen last mile delivery performance.

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