A Study on Last-Mile Delivery Challenges Faced by E-Commerce Delivery Boys in Coimbatore City

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Abstract. The expansion of e-commerce within Coimbatore City has led to the significant importance of the final stage of delivery in guaranteeing customer contentment and business prosperity. This research focuses on exploring the obstacles faced by e-commerce delivery staff in Coimbatore City during the ultimate phase of the delivery process. By utilizing qualitative interviews, surveys, and observations, information was gathered from delivery personnel employed by different e-commerce companies in the locality. The research utilized a combination of descriptive and analytical research methods. The sample consisted of 100 participants selected from Coimbatore city. The analysis involved the use of simple percentage, ranking, and Chi-square tests. The results of the study can contribute to the advancement of innovative strategies aimed at improving the efficiency, dependability, and sustainability of e-commerce delivery services, which would benefit businesses and customers alike. To summarize, this research on the challenges encountered by last-mile e-commerce delivery centers provides insights into the key factors that impact the operational effectiveness of delivery services within the e-commerce sector.

Index Terms- last-mile delivery, challenges, delivery hub, e-commerce.

I. Introduction

The term "last mile delivery" describes the last phase of the logistics process, which involves moving products from a warehouse or distribution center to the ultimate customer's address. The "last mile" is so named because it's usually the longest and last delivery leg, but it may also be the most expensive and complicated segment of the supply chain process overall. Businesses across a range of sectors, but especially e-commerce, retail, and food delivery services, need to prioritize last-mile delivery

since it has a direct influence on customer happiness and brand reputation. Effective last-mile delivery necessitates meticulous planning, optimization, and frequent use of specialist logistics solutions to get over obstacles like heavy traffic, distribution to remote areas, and accommodating particular client requirements like delivery instructions or time restrictions.

Objectives of the Study
- Identify the specific challenges prevalent in the last-mile delivery process within Amazon's e-commerce delivery hub.
- Examine the performance of last-mile delivery in the Amazon delivery hub.

II. Research Methodology

- **Research Design:** Descriptive Research and Analytical Research designs
- **Area of the Study:** Coimbatore city.
- **Sampling Technique:** Cluster and snow-ball sampling.
- **Data Collection:** Primary and secondary data
- **Sample Size:** 116
- **Tools Used for Analysis:** Simple Percentage analysis, Ranking, and Chi-square.

III. Review of Literature

1. Stanley Frederick, W T Lim, Xin Jin, (2018)

This article delves into the significance of last-mile delivery in setting businesses apart in the market, prompting investments in various innovative consumer delivery methods. It conducts an in-depth examination of existing literature on e-commerce last-mile distribution structures and the related situational factors.

The framework outlined sheds light on critical situational and structural factors and how they interact, offering viable configuration choices within specific constraints. The study adopts a methodology driven by protocols, using a "snowballing" technique for the literature review, a grounded theory approach for concept coding, and a differentiation between scientific and design-oriented research methodologies.

2. Volker Frehe, Jens Mehmann, Frank Teuteberg, (2005)

The study is primarily sourced from companies operating in Germany, offering a comprehensive perspective though lacking intricate details. The developed framework incorporates practical implications in the forms of commonly adopted and optimal practices, alongside scientific aspects such as exploring open research inquiries and assignments.

In essence, the study offers fresh insights into the emerging subject matter. The research methodology employed in this paper encompasses the Design Science approach, expert consultations, and examination of document-based data. The analytical techniques utilized in the study adhere to the detailed analysis methods specified by Koulikoff-Souviron and Harrison (2005) for scrutinizing the information available on

the companies' websites. Explanation: The paraphrased text maintains the original meaning of the research study, but presents it in a more refined and eloquent manner suitable for a knowledgeable audience. The formal tone is retained, ensuring coherence with the intended audience. The content has been rephrased to enhance clarity and readability while preserving the complex nature of the subject matter.

3. Andrii Galkin, Larysa Obolentseva, Iryna Balandina,(2019)
The research aims to investigate the impact of different variables on the effectiveness of final delivery processes instead of focusing on particular measures taken by participants.

It evaluates the combined efficiency of customers and logistics in last-mile delivery through methods such as economic-mathematical modeling, project assessment, data collection, range setting, simulation modeling, and automated computations utilizing Microsoft Excel. The study method considers consumer metrics and the logistics framework.

4. Daniel Merchán, Jatin Arora, Julian Pachon, (2022)
The paper introduces a novel, publicly available, real-world data set that researchers can use to advance the state-of-the-art in vehicle routing research and expand its applications to industry settings. The data set is the first large, real-world, publicly available routing data set, initially released for the 2021 E-commerce Last Mile Routing Research Challenge.

The research methodology involves introducing a research challenge data set aimed at engaging students and academics across the world with an underrepresented research stream on solving routing problems. The paper emphasizes the use of data-driven, learning-based solution approaches to capture the complex decision-making and tacit knowledge of seasoned delivery drivers. The authors expect the data set to narrow the gap between theoretical route planning and real-life route execution by incorporating mechanisms to learn from the tacit knowledge of experienced delivery drivers.

5. Yulia Vakulenko, Poja Shams, Daniel Hellström, and Klas Hjort's (2021)
Sudy shows that the last-mile delivery experience mediates the relationship between the customer's perception of the online shopping experience and customer satisfaction, and there is a significant relationship between online experience and customer satisfaction, as well as between online experience and last-mile delivery, customer satisfaction, mediated by the last mile delivery experience.

The research methodology used in this study is a quantitative approach, and the analysis tools used include mediation analysis to examine the relationships between online experience, last-mile delivery, and customer satisfaction.

Table No.: 1 (Simple Percentage Analysis)

	Table showing the years in operation		
1.	Less than 1 year	15	15.0
2.	1-3 years	63	63.0
3.	Above 3 years	22	22.0
	Table showing the gender of the respondents		
1.	male	72	72.0
2.	female	28	28.0
	Table showing the age of the respondents		
1.	18-24	42	42.0
2.	25-34	20	20.0
3.	35-44	19	19.0
4.	Above 44	19	19.0
	Table showing the geographic region		
1.	Urban	41	41.0
2.	Suburban	39	39.0
3.	Rural	9	9.0
4.	All the above	11	11.0
	Table showing the no. of deliveries complete in a day		
1.	1-10	14	14.0
2.	11-20	52	52.0
3.	21-30	20	20.0
4.	More than 30	14	14.0

Interpretation

From the above table, the majority of the respondents 63.0% have years of service from 1-3 years, 72.0% of the respondents are male respondents, 42.0% of the respondents are from the age group of 18-24, 41.0% of the respondents are from the urban region and 52.0 % can complete 11 -20 delivers in a day.

Table No. 2 (Ranking analysis)

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Rank
Traffic congestion	100	1.00	5.00	2.4400	IV
Address inaccuracies	100	1.00	5.00	2.7500	II
Parcel theft	100	1.00	5.00	2.8400	I
Customer unavailability	100	1.00	5.00	2.6800	III
Inefficient route planning	100	1.00	5.00	2.0100	VII
Vehicle breakdowns	100	1.00	5.00	2.3900	V
Communication breakdowns	100	1.00	5.00	2.2700	VI
Valid N (list wise)	100				

Interpretation

The above table shows the mean score analysis on the perception of the challenges within the delivery process. It shows that parcel theft, sociable ranked as I (with Mean =2.8400) followed by, address inaccuracies ranked as II, customer unavailability ranked as III, traffic congestion ranked as IV, vehicle breakdowns ranked as V, communication breakdowns ranked as VI, inefficient route planning ranked as VII.

- **Null Hypothesis (Ho):** There is no significant difference between the gender of the respondents and the level of awareness and perceived performance with last-mile delivery in e-commerce.
- **Alternative Hypothesis (H1):** There is some significant difference between the gender of the respondents and their level of awareness and perceived performance with last-mile delivery in e-commerce.

Table No.3 (Chi-Square Analysis)

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender of the Respondents * Level of Awareness and Perceive the Performance with Last-Mile Delivery in E-Commerce	100	100.0%	0	.0%	100	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.379[a]	20	.187
Likelihood Ratio	29.331	20	.081
Linear-by-Linear Association	3.810	1	.051
N of Valid Cases	100		
a. 37 cells (88.1%) have an expected count of less than 5. The minimum expected count is .28.			

Interpretation

As per the above table, it is inferred that the P value is 0.187; it is not significant to a 5% (0.05) significant level. The minimum expected count is 0.28. Thus, the null hypothesis is accepted and it is found that there is no significant relationship between the gender of the respondents and the level of awareness and perceived performance with last-mile delivery in e-commerce.

Findings of Simple Percentage Analysis

From the above table, the majority of the respondents 63.0% have years of service from 1-3 years, 72.0% of the respondents are male respondents, 42.0% of the respondents are from the age group of 18-24, 41.0% of the respondents are from the urban region and 52.0 % can complete 11 -20 delivers in a day.

Findings of Ranking Analysis

The mean score analysis on perception of the challenges within the delivery process. It shows that parcel theft, sociable ranked as I (with Mean =2.8400) followed by, address inaccuracies ranked as II, customer unavailability ranked as III, traffic congestion ranked as IV, vehicle breakdowns ranked as V, communication breakdowns ranked as VI, inefficient route planning ranked as VII.

Findings of Chi-Square Analysis

There is no significant relationship between the gender of the respondents and the level of awareness and perceived performance with last-mile delivery in e-commerce.

Suggestions
- The company should actively seek updates on last-mile delivery advancements through industry publications, conferences, and networking opportunities.
- The company should benchmark its delivery performance against industry leaders like E-commerce and strive to meet or exceed expected delivery timeframes.
- Effectiveness of real-time package tracking systems and consider implementing similar technology to enhance customer experience.
- The company needs to ensure that multiple communication channels are provided to customers for inquiries, updates, and feedback.
- The company should study e-commerce strategies for addressing failed deliveries and adapt best practices to improve its delivery operations.

IV. Conclusion

In conclusion, this study on last-mile delivery challenges faced by e-commerce delivery hubs sheds light on the critical factors influencing the efficiency and effectiveness of delivery services in the e-commerce industry. Through extensive analysis and evaluation of various aspects such as delivery schedule optimization, customer communication, and personnel training, it is concluded that addressing these challenges is paramount to enhancing customer satisfaction and optimizing delivery operations. It is evident that delivery plays a major role in influencing customer satisfaction, and therefore, companies must prioritize investments in infrastructure, technology, and personnel training to overcome challenges such as traffic congestion, address inaccuracies, and communication breakdowns. Additionally, recognizing the significance of e-commerce and benchmarking against industry leaders like E-commerce can provide valuable insights for improving delivery performance and meeting customer expectations. Overall, it is imperative for e-commerce delivery hubs to continu-

ally seek updates, implement best practices, and adapt to evolving consumer preferences to remain competitive and successful in the dynamic landscape of last-mile delivery.

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