



A STUDY ON PERFORMANCE OF LAST MILE DELIVERY OPERATORS TO ONLINE CUSTOMERS

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Abstract

When an order is moved from a transportation hub to its destination, it achieves the last mile delivery process. In India, there were around 185 million internet shoppers in 2021. When compared to the previous fiscal year, this was a significant increase. There will probably be 425 million consumers annually in 2027. This study looks at how well last-mile delivery companies perform when providing delivery services to internet customers. The last mile delivery is a crucial link in the supply chain for e-commerce, and the level of service can have a big impact on consumer's happiness and loyalty. Thus, there is a need to examine the performance of Last mile delivery operations to online customers and understand the factor that support achieving the customer satisfaction. Hence, the researchers attempted to conduct this research to examine the delivery time, delivery accuracy, and customer service with following objectives: a) To examine the performance of Last Mile delivery operators, b) To determine the factors that affect customer satisfaction, c) To examine the relationship between gender and the period of shopping through online and d) To suggest ideas to logisticians to improve customer satisfaction. The study used both primary and secondary data. The research is **Descriptive in nature. The sample size of the study is 125**, which are selected using **Random Sampling Technique**. The samples were the online consumers either completely or partly in their daily needs fulfillment. The study revealed that there is no association between gender and the period of shopping in online portals, Customer service is mainly influenced by Right product, Right Place and on Right time.

Introduction

People who shop online use websites and applications. The customers have easy access to a huge selection of goods and services from all over the world that can be ordered and delivered to their door step. Understanding these differences is crucial for e commerce businesses to thrive, as online customers have different expectations and requirements than traditional brick-and-mortar customer .Last mile operators are vital for the e-commerce sector, and are responsible for getting products from the warehouse or distribution center to the customer's door. Due to issues such as inconsistent delivery locations, high delivery prices and limited delivery windows, last mile

delivery is often seen as the most important and difficult part of the delivery process. The last-mile delivery industry needs to implement innovative solutions to these problems, such as autonomous cars, real-time tracking systems, and route optimization algorithms. A seamless and successful delivery experience also depends on strong communication and collaboration between last mile suppliers, e-commerce companies and customers. Operators of last-mile delivery services must be able to optimize delivery routes, reduce delivery times and costs, and inform consumers quickly and reliably in order to be successful. This requires an awareness of the local delivery environment and customer preferences. Last mile delivery operators are vital to the e-commerce sector, and delivering excellent customer experiences depends on their ability to innovate and respond to changing consumer needs and technological improvements.

Objective

1. To examine the performance of Last Mile Delivery Operators
2. To determine the factors that affect customer satisfaction.
3. To examine the relationship between gender and the period of shopping through online
4. To suggest ideas to logisticians to improve customer satisfaction.

Scope and Limitation

This study enables to understand the performance of last mile delivery operation done by the logisticians to the online customers. It also helps to identify the function that influence the customer satisfaction this study is limited only in Tamil Nadu this study is limited to analysis only last mail delivery in online shopping Time period (6month) from dec2022-may2023

Literature review

¹Bopage, G., Nanayakkara, J., &Vidanagamachchi, K. (2019, March). A strategic model to improve the last mile delivery performance in e commerce parcel delivery, the document offers an advantageous strategic outline to boost the efficiency of last-mile delivery in e-commerce parcel delivery. The suggested outline takes into consideration several variables that impact the last leg of delivery, and it stresses the significance of involving stakeholders to accomplish optimal outcomes. This paper analyzes the strength and weakness of current practices through qualitative and quantitative analysis.

²Mangiaracina, R., Perego, A., Seghezzi, A., &Tumino, A. (2019). Innovative solutions to increase last-mile delivery efficiency in B2C e-commerce, the article provides insightful information on the many innovative approaches that can be used to improve the effectiveness of last mile delivery in B2C e-commerce. In order to improve the delivery experience for customers, the article emphasizes the need for e-commerce companies to adopt new technologies and collaborate with logistics providers.

³ Boysen, N., Fedtke, S., &Schwerdfeger, S. (2021). Last-mile delivery concepts: a survey from an operational research perspective, the paper delves into an extensive examination of theories related to last mile delivery through the lens of operations research. To enhance last-mile delivery, the paper underscores the criticality of taking into account customer preferences and behavior, assimilating technology, and constructing sustainable delivery alternatives.

⁴Zhou, M., Zhao, L., Kong, N., Campy, K. S., Xu, G., Zhu, G., Cao, X., & Wang, S. (2020) A variety of variables, including customers' age, income level, level of education, and prior use of these services, affect how readily they accept self-service parcel services. Consumers who were younger, had better incomes and educational levels, and had previously used self-service parcel services were more likely to employ these services. According to the study, consumer views of the cost-effectiveness, convenience, and security of self-service parcel services were significant predictors of uptake.

⁵Xu, M., Ferrand, B., & Roberts, M. (2008). The study makes use of qualitative and quantitative research techniques, such as customer surveys and interviews with retailers. The writers look at the convenience, trust, and security issues that may influence the acceptance of unattended delivery. According to the research, customers often prefer unattended delivery since it is more convenient and flexible in terms of delivery time. The survey also shows that retailers consider unattended delivery to be a cost-effective and efficient delivery strategy that may boost client satisfaction and save down on delivery expenses. However, unattended delivery might be advantageous for both parties provided security issues are resolved and suitable steps are implemented to guarantee package delivery safety

⁶Bosona, T. (2020). The study examines how last-mile logistics currently works in cities. The article lists a number of difficulties in last-mile logistics, such as: lack of parking spaces, traffic restrictions and the need for effective delivery and routing technologies. The paper proposes a number of tactics to improve the sustainability of last mile logistics while addressing these issues. The paper claims that the sustainability of last-mile logistics in metropolitan environments can be improved through a mix of different delivery modalities, effective route planning and technology solutions.

⁷Cho, Y., Xue, L., Huang, S. R., & Yang, Z. P. (2021). The paper examines the elements that influence the ability of rural last-mile delivery services to keep customers happy. The authors created a customer satisfaction model that takes into account various aspects of consumer satisfaction, including delivery time, cost, reliability, and quality of service. Data from a survey of 381 rural consumers who used last-mile delivery services was used to evaluate the model. According to the survey, the decisive factor was the quality of the delivery service. Delivery speed, delivery accuracy, delivery completeness, and delivery flexibility are some of the elements of delivery service quality that the authors highlighted. The survey also found that while delivery time had a small impact on customer satisfaction, delivery cost and delivery reliability had a significant impact.

⁸Escudero-Santana, A., Muñuzuri, J., Lorenzo-Espejo, A., & Muñoz-Díaz, M. L. (2022). The authors argue that traditional last-mile logistics, which rely on predetermined delivery routes and times, are ineffective for distributing goods for e-commerce. As an alternative, they propose a dynamic delivery system that offers customers a choice of delivery alternatives based on their location and desired delivery time. A network of strategically positioned distribution centers and micro-warehouses would serve as the backbone of the system, optimizing delivery routes while reducing delivery times. The authors conducted a case study to evaluate their strategy. The use of

technology to support the dynamic delivery system, including real-time tracking of delivery trucks, automated order processing and predictive analytics to optimize delivery routes and times, is critical to the strategy's success, the authors said.

⁹El Moussaoui, A. E., Benbba, B., & El Amrani, L. (2022) According to the authors, both the effectiveness of delivery operations and the level of customer satisfaction are influenced by the architecture of the distribution system, making them a crucial part of last-mile logistics. The article gives an overview of the entire work. Based on their review, the authors propose a study agenda for the next studies on the design of distribution systems in last-mile logistics. On this agenda are the development of sustainable delivery models that reduce the environmental impact of last-mile logistics, as well as research into cutting-edge technologies such as drones and autonomous vehicles for last-mile delivery. Research on the use of data analysis and artificial intelligence to optimize delivery routes is also included.

¹⁰Chen, C., Leon, S., & Ractham, P. (2022) According to the authors, the success of drone delivery services depends on consumer acceptance, which in turn is determined by a number of variables including ease of use, perceived utility, and technical confidence. The authors surveyed consumers in emerging markets to address these issues. Based on their findings, the authors advise companies planning to roll out last-mile drone delivery services to focus on building consumer confidence by responding to concerns about security, privacy, and reliability. To encourage adoption, they advise companies to highlight the practicality and affordability of drone delivery services.

Research Methodology

The research is carried out by studying primary and secondary data. The secondary data is analyzed from various articles, magazines and research thesis, which is considered as authentic data. With that insight, the primary data collection has been collected by questionnaire method. The questionnaire consisted of questions that state the various variables that are pertaining to last mile delivery. The Sample size of the research is 125. The sampling technique followed is Convenience Sampling. All the authentic samples are used for statistical analysis through SPSS. The tools used in this research paper are Chi-Square, ANOVA and Weighted Average.

Data Analysis and Interpretation

1.1 Chi-Square test

Chi square test is executed to discover the existence of significant relationship among the variables.

H₀: There is no significant relationship among the variables Gender and how long have you been shopping online.

Table 1.1.1- Shows the chi square analysis for the variables Gender and How Long Respondent Shopping Online

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.787 ^a	4	.594
Likelihood Ratio	2.788	4	.594
Linear-by-Linear Association	.009	1	.926
N of Valid Cases	125		

It is observed from the above table, Chi Square value is 2.787, the significant P value is found to be $0.594 > 0.05$, hence it is determined to accept the null hypothesis. Therefore, it is understood that, there is no likeliness between Gender and how long have you been shopping online.

1.2 Analysis of Variance (ANOVA)

ANOVA is implemented to find the existence of significant variance between Delayed Deliveries from Last Mile Delivery Operator and Information of Shipping Which are Shared in the Website

H₀: There is no significant variance exist between variables delayed deliveries from last mile delivery operator and Information of shipping which are shared in the website

Table 1.2.1- Table shows ANOVA Analysis

ANOVA					
Information of shipping which are shared in the website 1 and it is easy to track					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.013	4	1.253	1.967	.104
Within Groups	75.825	119	.637		
Total	80.839	123			

Inference

It is observed from the ANOVA test, F is value is found to be 1.967. P value is found to >0.05 . Thus, it is concluded to accept the Null Hypothesis. Therefore, it is found that there is no significant difference between the variables delayed deliveries from last mile delivery operator and Information of shipping which are shared in the website. It is revealed that, there is association between variables, delayed deliveries from last mile delivery operator and Information of shipping which are shared in the website

1.3 Correlation Test

Aim:

To find the relation or reciprocal between the variables information of shipping which are shared in the website and delayed deliveries from last mile delivery operators.

-1.00 to -0.90	-0.90 to -0.70	-0.70 to -0.50	-0.50 to -0.30	-0.30 to 0.00
very strongly negative correlation	Strong negative correlation	Neutral negative correlation	Weak negative correlation	Minimal negative correlation

Table 1.3.1 – Correlation analysis

Correlations			
		Information of shipping which are shared in the website 1 and it is easy to track	How often you experience delayed deliveries from last mile delivery operators?
Information of shipping which are shared in the website 1 and it is easy to track	Pearson Correlation	1	-.126
	Sig. (2-tailed)		.162
	N	124	124
How often you experience delayed deliveries from last mile delivery operators.	Pearson Correlation	-.126	1
	Sig. (2-tailed)	.162	
	N	124	125

Inference

The correlation effect to negative value (-0.126). Hence, the relation between information of shipping which are shared in the website and delayed deliveries from last mile delivery operators is Minimal negative correlation (-0.30 to 0.00).

1.4 Weighted Average Analysis

Aim: To find average mean considering the variables with varying degrees.

Table 1.4.1 Weighted Average Analysis

Satisfactory level	Right product	Right quantity	Right Condition	Right customer	Right time	Right Place	Right price	Total
Outstanding	310	280	250	240	300	350	310	2040

Excellent	360	333	288	288	288	315	270	2142
Very good	200	192	240	232	272	216	216	1568
Good	126	133	154	161	133	112	147	966
Above average	30	48	30	12	24	12	36	192
Average	15	25	20	50	25	25	25	185
Below average	4	0	16	8	0	12	8	48
Weak	0	6	6	6	3	3	3	27
Poor	2	2	2	0	0	0	0	6
Terrible	1	1	0	1	0	1	2	6
Total	1048	1020	1006	998	1045	1046	1017	7180

Rank	Variable	Mean
1	Right Product	8.384
2	Right Place	8.368
3	Right Time	8.360
4	Right Quantity	8.16
5	Right Price	8.136
6	Right Condition	8.048
7	Right Customer	7.984

Inference

From the above table, the variables contributing to Customer satisfaction in terms of Last mile operation are ranked based on its mean Value. It is found that, **Right Product** is the First factor with highest mean value 8.384. The **2nd rank and 3rd rank** opted by the customers to **Right Place and Right time** with mean value **8.368 and 8.360** respectively. The customers opted least opinion to Right customer with mean value **7.984**, which has 7th rank among all the seven variables.

FINDINGS AND CONCLUSION

From the analysis the findings of the test done with different statistical tools are stated.

I. Findings of Chi-Square

From the table 1.1.1 the analysis has found to accept null hypothesis. This states that there is no effect on how long the respondent shopped online with gender of the respondent.

II. Findings of ANOVA

There the significant value is said to be greater than significance level (from table 1.2.). Thus, the delay in the last mile delivery is said to be dependent on the information of the shipping process. Then the correlation test results found that information shared for the tracking is easier but there is delay in the last mile delivery.

III. Findings of Weighted Average

The result of weighted average revealed the factors that determines the customer satisfaction in last mile delivery. It is found that, Right Product, Right Place and Right Time are the mostly preferred factors by the customer for obtaining Customer Satisfaction.

CONCLUSION

The researcher undergone this research in understanding the effects last mile delivery operators on E-commerce platform. The study attempted to find the relationship of gender and how long the customers are purchasing from online shoppers and found that there is no any significant likeliness between gender and how far the customers are shopping online, which infers that gender of the customers doesn't influence the period of purchasing in online. The researchers suggested to the last mile delivery operators to concentrate on delivering the right products to the right place on the right time, which eventually develops, and embrace in organizational growth. The last mile delivery operators can have better opportunities in near future if they perform well in their last mile delivery operations and customer satisfaction can be achieved easily.

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