



A Study on Last-Mile Delivery for Superior Customer Service in E-Commerce

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ABSTRACT

The Indian e-commerce retail industry has experienced significant growth due to the widespread adoption of the internet, increased smartphone usage, and diverse language support on e-commerce platforms. Consequently, the e-commerce retail logistics sector has rapidly expanded. However, this expansion has brought forth fundamental challenges that the industry is striving to overcome. Issues such as high-cost pressures, elevated return rates, and inadequate physical infrastructure pose difficulties for the business.

Current trends and advancements in e-commerce retail, evolving customer expectations, and the rising demand for same-day deliveries are reshaping the operations of the online retail supply chain. Furthermore, the industry is witnessing the emergence of new business models such as omnichannel retailing and innovative last-mile delivery strategies involving local partnerships.

As the exponential growth of e-commerce fuels consumer expectations for faster and more flexible delivery, existing and emerging delivery models must adapt to cost-effective solutions that intelligently consolidate orders, optimize delivery routes, and leverage artificial intelligence and advanced analytics. Failure to do so may jeopardize the survival of these delivery models in a dynamic and demanding delivery environment.

The pressure on retailers, delivery providers, and the broader supply chain to fulfil more orders quickly and at reduced costs is mounting due to the "last mile" delivery, which represents the most expensive and time-consuming phase of the fulfillment process. Consequently, e-commerce merchants are exploring ways to optimize their retail operations through the integration of emerging technologies and processes that enhance operational efficiency and minimize delivery expenses. The goal is to enhance the customer experience by providing relevant information, personalized services, and incentives for repeat purchases.

Keywords: Last Mile Delivery, India, Logistics, E-Commerce, Customer Satisfaction

1. Introduction

E-commerce is India's fastest growing and most interesting commercial transaction medium. According to research started by export.gov, a project of the Department of United States of Commerce's International Trade Administration, the e-commerce sector of India is predicted to rise to US\$200 billion by the year 2026, from US\$48.5 billion in 2018. This expansion has been fueled by rising internet and smartphone usage. Customers increasingly expect faster, cheaper delivery as well as more control over their experience. The oppression on retailers, delivery providers, and their wider supply chain to deliver more parcels in short time with less cost to meet customer expectations is increasing because the "last mile" is the ultimate phase of the transport process when the parcel is delivered to the end-consumer, and it is the most expensive and time-consuming step of the accomplishment process.

A marketing paradigm shift dubbed "liquid expectations" by Ford, a worldwide design and innovation firm, is influencing the rising need for a smoother, more instantaneous delivery experience. Customer expectations are not just restricted to a single product category; they now span several sectors and experiences. As an outcome, end-consumers are becoming ever more dissatisfied with the level of service given by incumbent delivery providers and are more susceptible to the allure of disruptive newcomers who can match their needs.

Customers who are always on and tech-savvy are wanting speedier delivery as a result of their experiences. They likewise need more highlights, the greater part of which are equipped at giving them more command over the conveyance interaction. For instance, the capacity to pick and change conveyance windows, track conveyances continuously, and even talk straightforwardly with drivers are choices. These highlights will immeasurably further develop the conveyance experience and will be basic in holding customers when their steadfastness is at an unequaled low.

1.1 Last Mile Delivery

It is the last stage in the store network — the exchange of merchandise from the business to the end client. Concentrates on show that in the request satisfaction process, clients put a higher worth on comfort than on anything more. This, combined with the rising percent of generally deals originating from web-based shopping, is coming down on ventures to give more advantageous conveyance choices. Be that as it may, giving the ideal client experience relies upon productive, adaptable conveyance activities - which thus depend on having the right framework and cycles set up.

The center last mile conveyance stream comprises of five significant stages:

- Orders are handled through a concentrated framework. Both the shipper and the beneficiary will actually want to follow and comprehend where the request is in the store network subsequently.
- The request is steered and shows up at the transportation center point. The primary thought process is to lessen the time it takes to go from the center to a definitive conveyance area (the "last mile").
- Delivery task is an essential technique that doles out things a course and the most proficient conveyance strategy. It tends to be mechanized (as in on-request conveyance), manual, or a crossover of the two.
- Scan-orders are examined as they pass on the transportation center to keep the framework - and all partners - cutting-edge on the last mile.
- The shipment has shown up at its objective, and conveyance has been affirmed.

1.2 Conceptual Framework of Last Mile Delivery

1.2.1: The Problem of Last-Mile

Last mile conveyance, in basic terms, is the development of merchandise from the last transportation center to the last conveyance objective. The focal point of last mile is to convey items to end purchasers straightaway with most minimal expenses, subsequently advancing effectiveness and upgrading consumer loyalty. Last mile conveyance, today, is where, customer connections are made. Keep going mile conveyance, then again, is an immense test in a shifted country like India for firms like web based business, which require conveyance from a distribution center to clients. Numerous advancements have become typical, like money down, fast returns, and no-cost EMI, however different impediments remain. The key gatherings participated in Last-Mile coordinated factors are: Retailers, Last Mile specialist co- op and the Customer. Some of the time, the actual retailer do the Last mile conveyance while certain retailers re-appropriate this progression to the current Third Party Logistics.

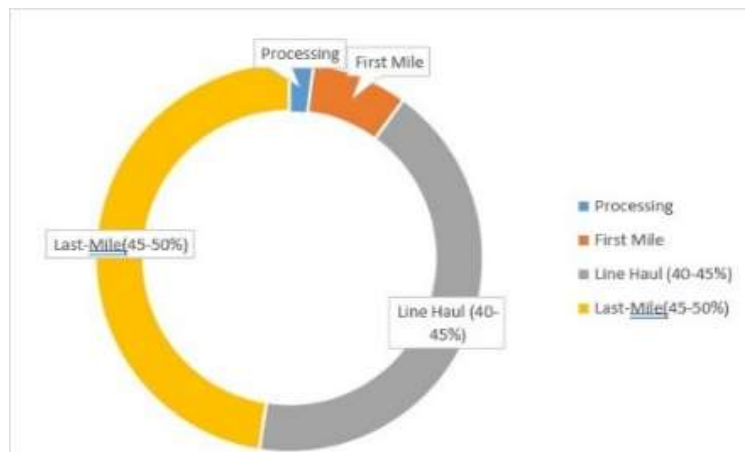


Fig 1. E-commerce Retail Transportation Cost Split



Fig 2: The Order-Delivery Cycle

1.3 Major Challenges

While thinking about why the 'last mile' conveyance is so expensive and incapable, it has been figured out that the fundamental reasons are:

A. No Real Time Visibility & Customer Friction:

Clients need full, continuous perceivability of their orders including the specific season of conveyance. As of now status shows out for conveyance yet has not ongoing feed. A definitive on-request experience is accomplished by combining state of the art improvement innovation. Constant following has become one of the essential specialized accomplishments utilized by various stages. Clients that have ongoing observing know.

B. Missed Delivery:

According to reports, for each 100 conveyances, the conveyance individual makes 140- 150 visits. These gets expanded in the event of modest communities and country regions. Explanations behind this can be rescheduling or recipient not accessible, and so forth.

Client fulfillment is guaranteed by keeping the client informed with convenient updates all through the conveyance interaction. Warnings on the shipment, travel, and conveyance of their request assist with ensuring that the client is accessible at that point and area of conveyance.

C. Address Issues & Customer Nuances:

Middle region covered by a pin-code in India is 90 sq.- km which might contain up to 1,000,000 families. Furthermore, there are house numbers and milestones which are either wrong or befuddling. Figuring out the location is opportunity consuming and continuous calling to clients for headings frequently aggravates them. Inability to precisely find a location prompts failures in related methodology, for example, course arranging, finding the closest satisfaction community, and finding conveyance accomplices.

D. Low Volume Density:

Small vendors and driver-cum-owners account for 70% of the last mile logistics industry. According to a Shadowfax assessment, this unorganised sector is plagued by supply chain inefficiencies, which maintain the ecosystem's average utilisation at a low of 35%. These inefficiencies may be classified into three categories: ineffective route design, inefficient space usage, and concentrated demand at peak periods.

Wasteful courses bring about ineffectively overseen time and fuel consumptions for the organization, as well as unnecessary deferrals for the buyer. By considering a large number of factors, Route Optimization moves past this hindrance. Calculations guarantee that drivers complete most conveyances at all measure of time and consuming minimal measure of fuel by processing factors like: driver accessibility, area closeness, conveyance windows, traffic conditions, neighborhood guidelines, least and greatest request load, weight limit, and so forth.

2. Review of Literature:

Paper-1: Yulia Vakulenko, Poja Shams, Daniel Hellström & Klas Hjort (2019), "Online retail experience and customer satisfaction: the mediating role of last mile delivery", *TheInternational Review of Retail, Distribution and Consumer Research*.

The unprecedented development of online business in various undertakings all through the world as of late has been eminent. In view of the Internet, retailers can connect with additional clients, expand a lot further in the conveyance chain, and boost their assets. In the present economy, client experience has turned into a wellspring of upper hand. This study researches the significance of keep going mile conveyance on the client's web based business experience. A quantitative methodology was utilized, incorporating a study led in Sweden that inspected members' latest online business experience. The last mile conveyance experience, as per the information, intercedes the connection between buyer impression of the web-based buy insight and client joy. These discoveries open the way for future top to bottom concentrate on the financial significance of last-mile conveyance. These discoveries prepare for future top to bottom concentrate on the job of last mile conveyance in the web based business climate, as well as help to e-rears in expanding customer fulfillment.

Paper-2: Marshall Fisher, Santiago GallinoTuck, Joseph (Jiaqi) XuTepper, "Value of RapidDelivery in Online Retailing", 2016

For online dealers who sell actual things, each exchange has two fundamental parts: the real article and the administrations provided by the business to empower the exchange. In spite of the way that conveyance speed is certainly the main assistance part for online vendors, no exact exploration have been attempted to decide the monetary worth of quicker conveyance for a web-based business. Thus, web firms are constantly faced with a crucial open inquiry: do the advantages of speedier conveyance offset the expenses of more limited conveyance lead time? We look at the impact of quicker conveyance on deals utilizing a semi regular trial including the presentation of another internet-based dissemination place (DC), which diminished of a significant U.S. clothing store. We found that income from affected clients expanded by around 4% on normal after the new DC opened, with the addition diminishing contrarily with distance from the new serving DC. As per our exploration, the expansion in pay is generally owing to clients putting in additional requests and buying more costly things following the new DC's introduction. Moreover, newly gained clients and inconsistent buys were the customer bunches generally receptive to the conveyance speed improvement. The subsequent DC raised net benefit by 2.2 percent, as per our estimations, in light of the fact that the edge on new deals and a decrease in transportation charges for western clients outperformed the decent expense of working a subsequent DC.

Paper-3: Tze-Hsien Liao, Ching-Jui Keng, "Online shopping delivery delay: Finding a psychological recovery strategy by online consumer experiences", *Computers in HumanBehavior* Volume 29, Issue 4, July 2013

While thirty years of examination have incredibly added to a superior information on the client web based business experience, data on internet business conveyance methods is scattered and rather limited. The conveyance methodology was featured as a significant quality calculate starter concentrate on the client internet business experience. It shows that the degree of consumer loyalty can fluctuate between the phases of online retail checkout and after conveyance, exhibiting that conveyance affects complete buyer fulfillment. Following thirty years of exploration, we have a divided and incredibly restricted information on the connection between conveyance techniques and the internet business experience. Existing exploration, be that as it may, uncovers a connection between the client's examination of the web-based insight and their experience once a bundle shows up. Dependable conveyance has been referred to as a wellspring of shopper esteem in online business. On-time conveyance, cost, and add up to conveyance have all been distinguished as signs of shopper fulfillment and dependability to an internet business website. Mental disharmony created by conveyance defers impacts clients' impression of the web-based buying experience. Since clients see a web-based business experience comprehensively, an unfortunate conveyance result might impact all out consumer loyalty and future purchaser collaborations with a specific e-retailer. Think about the accompanying model: A buyer buys a thing on the web yet is disappointed with the conveyance experience, notwithstanding an immaculate internet buying experience. Accordingly, clients might change to other internet business locales to forestall future help disturbances. A very much conveyance time for a significant subset of western U.S. clients planned web-based buy experience is remembered to consider client conveyance prerequisites and may consequently decidedly affect the last mile conveyance process, as the e-retailer is the entertainer who chooses which conveyance choices the purchaser can browse.

Paper-4: Gregory R. Heim, Kingshuk K. Sinha, "Operational Drivers of Customer Loyalty in Electronic Retailing: An Empirical Analysis of Electronic Food Retailers", 2001

This study takes a gander at the connection between client unwaveringness and the request obtainment and request satisfaction procedures utilized by online organizations. The review test contains information from 52 internet based food stores. Subsequent to adapting to the dealers' item classifications in light of plan adaptability, the discoveries of our relapse examination exhibit that three request obtainment factors — site route, item data, and value — and three request satisfaction factors — item accessibility, practicality of conveyance, and simplicity of return — have a significant relationship with client devotion. These attributes, in plummeting request of their different commitments to expanding customer faithfulness, are as per the following: simplicity of return, idealness of conveyance, site route, item accessibility, cost, and item data.

3. Research Methodology

The experimental research design along with the descriptive is adopted to conclude the inferences of hypothesis testing and research.

The study is centred on evaluating the hypothesis and study obtained from the literature review to determine the impact of last mile delivery on the behavior on consumer behavior.

- To understand how delivery time impacts loyalty of consumers.
- To understand how better delivery service impacts consumer shopping behavior.
- To understand how customers reacts over their shopping experience.

3.1 Theoretical Framework

The theoretical framework emphasizes the connection between dependent and independent variables. The distinction between dependent and independent variables is significant in both comparative studies and regression analyses. The possibility, degree of willingness, and tendency of customers to acquire a product or service within a given time period is referred to as buying intent, also known as buyer or purchasing intent. A buyer's intent to buy can be demonstrated in a variety of ways that you can track, including demographics, previous purchases from the site, and the delivery service they have received from particular site. By explicitly questioning survey respondents about their purchasing intentions, we were able to determine this.

The research project is based on a combination of both primary data and secondary data. The main source of data for the research project will be through secondary research available online. The secondary data will be used for an in-depth analysis of the current problems being faced by the e-retailers in winning the Last-Mile challenge in the Indian E-Commerce sector and how these problems are being tackled. The secondary data will also allow to get insights into the current models being used by companies like Amazon, Flipkart, Dunzo etc to enhance customer satisfaction.

In order to collect the primary data, a questionnaire was floated to garner response from customers to get an insight on customer expectations from e-commerce deliveries. The sample size is presented here is for 100+ people. The primary data will help us understand the customer's point of view and how companies can use technology and efficient last-mile operation to provide superior service experience to the customers and thus ensure customer loyalty and customer retention.

3.2 Tools of Data Collection

To collect the data about the impact of product visuals, we will collect the data through questionnaire (method: google forms) which also including the experimental questions.

3.3 Sampling technique

A sample size of 112 respondents will be employed for the study, which will be done using a basic random sampling technique, in order to generalize the findings in the particular sector. All of the respondents and their purchasing habits are unique to India's demographics.

3.3.1 Measures

The questionnaire consists of 12 questions, where 6 questions collect data based on intentions and descriptive study and the other 6 questions is based on experimental analysis. Some questions are based on photo, where the respondents answer the question based on the photo presented to them for experiment purpose.

The questionnaire clearly mentions the non-considering of price as variable in decision making and personal data of respondents is not collected to remove personality biasness from the research.

The questions are based on multiple choice and Likert scale ranges from 1 to 5, where 1 refers to unaffected and 5 refers to highly affected behavior. Customer satisfaction benefits from a great last-mile delivery service, which can hence lead to the following benefits:

- I. Loyalty increases when faster delivery choices are made accessible.
- II. Increased readiness to pay for speedier delivery.
- III. Higher monthly spend.
- IV. More frequent purchases.

In addition to this, survey reports from KPMG, IBEF and data from company websites was also used, which helped us analyse and present a clear picture about the topic.

4. Analysis and Results

4.1: Primary Research Analysis

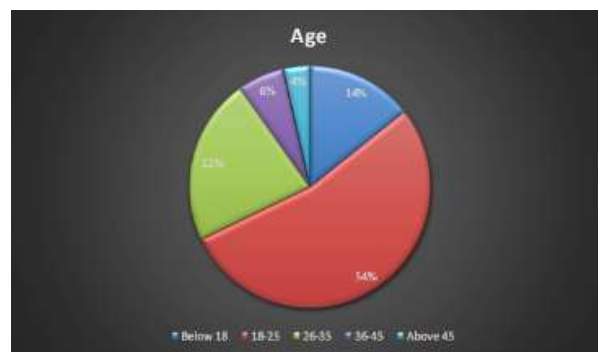


Fig. 3 Division of Age groups in survey

Analysis

1. From this pie chart, we can see different age groups participated in the survey.
2. Most of the people, who participated in the survey, are from the age group 18-25. And their participation rate is 54%.
3. People above the age 45, have the least participation.

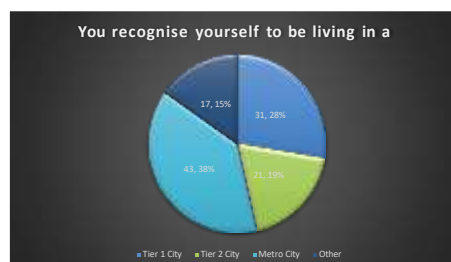


Fig 4: City wise distribution of survey group

Analysis

1. From this graph, we can see the geographical diversification of survey group.
2. Most of the people belong to Tier 2 city, with the percentage of 43%.



Fig. 5: Importance of delivery service in online shopping

Analysis

1. From the graph we can interpret that about same-day delivery increases the loyalty of customers.
2. But as the time of delivery increases, loyalty of customer decreases.

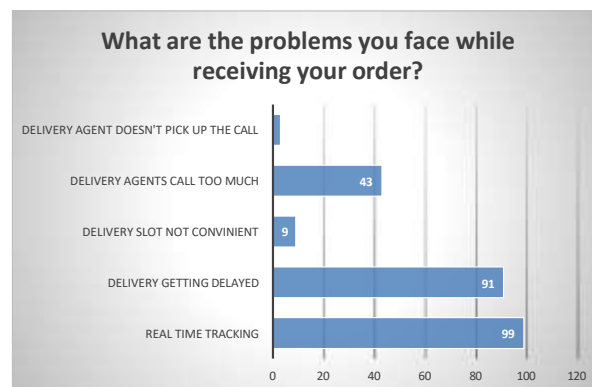


Fig. 6 : Problem faced by customer while receiving orders.

Analysis

1. Most of the people face the problem of real time tracking of their orders.
2. After that the problem people face is of delayed delivery.
3. In very few cases, delivery agents don't pick call.

4.2: Primary Research Results

From the Primary Research that was done by floating a Google From the following major observations were made:

- Amazon, Flipkart were the two most used e-commerce platforms, being followed by Myntra and Paytm.
- Around 38% of the respondents used online shopping at least once a month. Only 8% of the respondents used online shopping less frequently.
- More than 50% respondents felt that Delivery service was the most important factor while purchasing online.
- After a good delivery service experience, almost 90% of the respondents were willing to share the positive experience with their friends and family, and also were willing to try other products from the same retailer. Also, around 75% of the respondents, were willing to increase their spend with the retailer after a positive delivery experience. More than 40% of the respondents were even willing to purchase paid delivery memberships from the e-retailer.
- Same day delivery was the most preferred option among the 112 respondents, with almost 62% of them agreeing that a same day delivery option will make them more loyal to the e-retailer.
- More than 50% of the respondents were willing to pay 0-25% of the order price as a delivery fees for a faster and more convenient delivery slot

- More than 75% of the respondents were also willing to use the Buy Online, Pickup In Store (BOPIS) option. With more than 50%, only willing to pick up from the nearest hub in case of an emergency.
- With regards to the last mile logistics, most respondents faced problems during the final step of the delivery process. Almost all of the respondents felt that not having a preferred delivery slot was the main problem while receiving the orders.

5. Observation and Recommendation

Based on our main and secondary research, we determined that having great last-mile logistics management is critical for improving customer experience and, as a result, ensuring customer retention and loyalty. The timely delivery of items to clients is critical to the success of e-commerce enterprises. No sale or discount will be successful unless this is accomplished. Inadequate last-mile delivery can lead to stock buildup and financial loss. The e-commerce business must focus on overcoming this issue, and I believe the basic measures listed below can assist e-retailers in dealing with last-mile delivery issues:

i. GPS Technology:

Clients maintain that the honor should have the option to way their packages continuously. It's presently sufficiently not to refresh a following message with an "out for conveyance" message. The present supporters are becoming acquainted to constant perceivability.

ii. Proper Communication:

Beside following, correspondence innovation keeps clients educated regarding conveyance notices and made aware of any unanticipated deferrals. This could assist with diminishing a portion of the dissatisfaction that accompanies a planned conveyance window that passes without any proof of the expected thing. At the point when a conveyance is close, buyers expect instant messages, messages, and even calls, as well as a subsequent contact once the conveyance has been finished. In any event, when it's horrendous information, ongoing correspondence is esteemed and goes far toward reinforcing purchaser associations.

iii. Route Optimization:

Course improvement is the cycle by which a transportation organization enters conveyance plans, locations, volume, and quite a few different information into an innovative framework, and the framework works out the best course for that day's (1) conveyances. Then, while the driver approaches their business, any changes might be input into the framework and the course can be straightened out. Course improvement has unquestionably been a unique advantage for an assortment of reasons. From the point of view of a transporter, it lessens how much void kilometers and superfluous stops, assists with keeping away from traffic deferrals and climate events, and tries not to need to close the day with undelivered things staying on the truck. From the viewpoint of a retailer, it guarantees on-time conveyance, permitting vows to purchasers to be met. Also, from the customer's viewpoint, it demonstrates that the conveyance will show up on the predetermined day and time.

iv. Partnership with local mom and pop stores:

On-time and secure conveyance may be troublesome in India since certain addresses are not official, and a few relatives might share a solitary personal residence. Purchase on the web, get available (BOPIS) may lighten a portion of these issues. Clients in metropolitan and country districts might get bundles quicker and all the more dependably by changing over local area offices like kiranas into little dispersion centers, acquiring extra income for retailers and further developing region inclusion for the e-retailer.

v. Use of Technology driven innovations in last-mile delivery:

The pace of innovative change has been very quick. To remain in business, organizations are embracing present day innovation. To stay aware of the speed of computerized trade, innovative headways are changing the web based business strategies and production network business.

With \$1.3 billion in retail innovation supporting got in the second quarter of 2018, last-mile coordinated factors beat the business. This is inferable from fostered countries' initial hug of new independent conveyance strategies, as well as areas of strength for an explanation in light of metropolitan interest and the current high work costs for satisfaction. Drone conveyance, the utilization of self-driving vehicles, self-serving storage spaces, conveyance to mind, and other huge developments have been investigated overall by a portion of the world's driving retailers, including Amazon, Walmart, and 7-Eleven.

6. Conclusion

The Indian web based business retail business is flourishing, and internet business retail is progressively getting momentum. Web infiltration is expanding, and versatile innovation is probably going to change the game. Since India is a blend of dialects and societies, provincial online business stages in neighborhood dialects and social trade are supposed to influence purchaser dynamic later on. The fame of advanced wallets is projected to proceed. Developing optional pay, expanded utilization of credit and check cards, diminished portable rates, and expanded cell phone use all add to these turns of events.

The calculated requirements of the three-trade retail industry are quickly creating in light of changing business conditions. Regardless of being a creating region, the internet business retail business requires a steady however viable coordinated operations framework to help this enormous industry. Thus, the online business retail operations industry is expected to adjust consistently to fulfill changing organization needs.

Shoppers right now want and expect quicker and more incessant conveyance. This is a major an open door for those organizations that get it appropriately. Nonetheless, providing expanded request doesn't give off an impression of being productive at the present. It simply costs a lot for vendors to supply this interest, and clients are reluctant to pay. Organizations require a thorough way to deal with catch the significant top-line occasion while moderating fringe risk. Such an arrangement needs the legitimate brilliant innovation, the right circulation model, novel techniques to compel, and the ability to get together with clients. Organizations can conquer the financial matters problem at the core of last-mile conveyance in the event that these four objectives are set up.

For a certain something, the last mile is the ongoing accentuation of the client experience - it's the second at which a shop either offers remarkable support to a customer or doesn't. In the present buyer driven retail environment, it just takes one not exactly ideal conveyance to lose a client forever.

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