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Difficulty in Ensuring Customer Satisfaction due to Delayed Delivers in E-Commerce

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***Abstract* – The rapid growth of e-commerce has significantly transformed supply chain management driving innovations in logistics, inventory management, and last-mile delivery. This study examines the impact of e-commerce expansion on SCM, highlighting challenges such as increased demand for speed, warehouse automation, and supply chain visibility. It also explores solutions like AI-driven demand forecasting, real-time tracking, and sustainable logistics. The findings suggest that businesses must adopt agile, technology-driven strategies to enhance efficiency and meet evolving consumer expectations in the digital marketplace.**

***Keywords* – Delivery issues, Customer**

I. INTRODUCTION

About the Sector

The rise of e-commerce has significantly transformed supply chain management (SCM) worldwide, leading to changes in logistics, inventory management, and last-mile delivery. Consumers now demand faster deliveries, low-cost shipping, real-time tracking, and seamless return policies. Companies must enhance speed, efficiency, and customization to stay competitive.

Key shifts include decentralized warehousing, real-time inventory tracking, and omnichannel integration. Last-mile logistics face challenges like delivery fragmentation, sustainability concerns, and technology integration with AI and blockchain.

Global & Gujarat Market

The global e-commerce sector continues to grow rapidly, driven by technology and consumer demand. Gujarat, a key industrial hub in India, is experiencing significant e-commerce expansion due to rising internet penetration, urbanization, and strong logistics infrastructure. Its strategic ports (Mundra, Kandla) and road-rail networks make it a crucial player in India's supply chain.

The e-commerce industry is led by major players like Amazon, Alibaba, Walmart, Shopify, eBay, and Flipkart, each employing advanced supply chain strategies, including AI, automation, and decentralized logistics networks. These companies focus on enhancing delivery speed, improving customer experience, and expanding their global reach.

Impact on Supply Chain Management

- **Consumer Electronics –** Global sourcing, high return rates, and real-time inventory management are crucial.
- Fashion & Apparel – Fast fashion demands agile supply chains, reverse logistics for high return rates, and sustainability efforts.
- **Home Goods & Furniture –** Bulky items require specialized handling, custom orders complicate inventory, and costly returns need efficient logistics.
- **Groceries & Perishables –** Cold chain logistics, short lead times, and waste management strategies are critical for ensuring fresh deliveries.

E-commerce growth continues to reshape supply chain models, emphasizing speed, efficiency, and sustainability.

II. LITERATURE REVIEWS

The rapid growth of e-commerce has significantly transformed supply chain management introducing new challenges and opportunities:

1. Supply Chain Agility & Integration

- Christopher (2016) and Gunasekaran et al. (2017) highlight how e-commerce has shifted supply chains from bulk shipments to more agile, demand-driven networks, emphasizing real-time data and AI for efficiency.

2. Last-Mile Delivery & Cost Management

- Lim et al. (2018) and Hübner et al. (2016) discuss innovations like drone deliveries, micro-fulfilment centres, and crowdsourced logistics to improve last-mile efficiency and reduce costs.

3. Technology & Automation

- Montreuil et al. (2016) and Lummus & Vokurka (2014) explore the use of robotics, IoT, and predictive analytics for real-time inventory tracking and warehouse automation, optimizing supply chain operations.

4. Blockchain & Security

- Saberi et al. (2019) emphasize blockchain's role in improving supply chain transparency, reducing fraud, and enhancing cross-border trade efficiency.

5. Omnichannel & Logistics

- Gallino & Moreno (2014) and Harrison & van Hoek (2020) discuss the integration of physical stores with e-commerce through omnichannel strategies, optimizing inventory distribution.

6. Sustainability & Reverse Logistics

- Mangla et al. (2021) and Rogers & Tibben-Lembke (2019) highlight the need for green logistics, electric delivery vehicles, packaging optimization, and efficient returns management.

7. Cross-Border E-Commerce

- Harrington et al. (2019) and Xu et al. (2016) examine the complexities of global supply chains, customs regulations, and international logistics strategies for e-commerce growth.

8. Personalization & Demand Forecasting

- Agatz et al. (2008) explore how e-commerce personalization influences supply chains, requiring dynamic inventory allocation and flexible fulfilment strategies.

Background of the Study

E-commerce has grown rapidly over the past two decades, transforming supply chain management (SCM) by increasing demand for speed, flexibility, and efficiency. Unlike traditional supply chains designed for bulk deliveries to retail stores, e-commerce requires handling high volumes of small, customized orders across global networks. This shift has led to significant changes in logistics, warehousing, transportation, and inventory management.

Businesses have adopted AI, automation, and real-time analytics to optimize operations, while challenges like last-mile delivery, reverse logistics, and international trade complexities have emerged. Additionally, growing consumer demand for sustainable practices has driven companies to adopt eco-friendly logistics solutions.

III. Problem Statement

Ensuring customer satisfaction in e-commerce is challenging due to delivery delays. Customers expect fast shipping, but issues like last-mile logistics, inefficient supply chain processes, and logistical bottlenecks often cause delays. These lead to dissatisfaction, negative reviews, and reduced brand loyalty, while also increasing operational costs for businesses. The complexity of e-commerce supply chains, involving multiple stakeholders like warehouses, third-party logistics providers, and local couriers, further complicates timely deliveries. Addressing this issue is crucial for maintaining a competitive edge and ensuring long-term customer satisfaction.

Objectives of the Study

- **Identify Key Factors Causing Delivery Delays –** Analyse internal (inventory management, order processing, warehousing) and external (transportation issues, weather, 3PL inefficiencies) factors contributing to delivery delays in e-commerce supply chains.
- **Evaluate the Role of 3PL in Timely Deliveries –** Assess the efficiency, response time, and technology use of third-party logistics (3PL) providers, examining their impact on meeting delivery deadlines and identifying areas for improvement.
- **Examine the Profitability of Faster Delivery Options –** Investigate whether offering expedited delivery (same-day/next-day) boosts customer loyalty and business growth while balancing the high operational costs of fast shipping.
- **Assess the Impact of Delivery Delays on Customer Satisfaction –** Study how delayed deliveries affect customer trust, reviews, repeat purchases, and overall brand reputation to help businesses mitigate negative consequences.

IV. Hypothesis

Our Used method is T-Test

1. Age

- **H0:** Age distribution is the same across genders.
- **H1:** Age distribution differs between genders.
- **p-value:** 0.502
- **Result:** Fail to Reject H0

2. Frequency of Online Shopping

- **H0:** Gender does not impact online shopping frequency.
- **H1:** Gender significantly affects online shopping frequency.
- **p-value:** 0.0067
- **Result:** Reject H0 (Significant)

3. E-commerce Platform Usage

- **H0:** Gender does not affect platform preferences.
- **H1:** Gender influences platform choices.
- **p-value:** 0.00012
- **Result:** Reject H0 (Significant)

4. Experience with Delivery Delays

- **H0:** Both genders experience delivery delays equally.
- **H1:** One gender experiences more delays than the other.
- **p-value:** 0.672
- **Result:** Fail to Reject H0

5. Satisfaction with Delivery Services

- **H0:** Gender does not impact delivery satisfaction.
- **H1:** Gender influences delivery satisfaction.
- **p-value:** 0.802
- **Result:** Fail to Reject H0

6. Importance of Timely Delivery
- **H0:** Gender does not affect views on timely delivery.
- **H1:** Gender influences the importance placed on timely delivery.
- **p-value:** 0.707
- **Result:** Fail to Reject H0

7. Trust Impact Due to Delays
- **H0:** Gender does not affect trust changes due to delays.
- **H1:** Gender influences trust impact.
- **p-value:** 0.230
- **Result:** Fail to Reject H0

8. Order Cancellations Due to Delays
- **H0:** Gender does not affect order cancellation behavior.
- **H1:** Gender significantly impacts cancellations due to delays.
- **p-value:** 0.0345
- **Result:** Reject H0(Significant)

9. Reasons for Delivery Delays
- **H0:** Gender does not affect perceived reasons for delays.
- **H1:** Gender influences perceived reasons for delays.
- **p-value:** 0.441
- **Result:** Fail to Reject H0

10. Frequency of Delays During Sales Events
- **H0:** Gender does not impact delay frequency perception.
- **H1:** Gender affects perception of delivery delays during sales.
- **p-value:** 0.320
- **Result:** Fail to Reject H0

11. Suggested Improvements for Delivery Delays
- **H0:** Gender does not impact improvement suggestions.
- **H1:** Gender influences suggested improvements.
- **p-value:** 0.395
- **Result:** Fail to Reject H0

12. Willingness to Pay for Faster Delivery
- **H0:** Gender does not affect willingness to pay for faster delivery.
- **H1:** Gender influences willingness to pay extra.
- **p-value:** 0.860
- **Result:** Fail to Reject H0

13. Perception of Flexible Delivery Slots
- **H0:** Gender does not impact belief in flexible slots improving satisfaction.
- **H1:** Gender influences views on flexible delivery slots.
- **p-value:** 0.979
- **Result:** Fail to Reject H0

14. Recommendation Based on Delivery Experience
- **H0:** Gender does not impact likelihood of recommending a platform.
- **H1:** Gender influences platform recommendations.
- **p-value:** 0.260
- **Result:** Fail to Reject H0

V. RESEARCH METHODOLOGY

Through the use of a questionnaire, the details that are necessary for the study are collected from the various respondents. Also used the tool to analyze data and statistical graphs and charts to know the accurate values.

Research Design

Quantitative and Qualitative research design.

Source of Data

The data was collected with the help of a structured questionnaire through Google survey forms.

Data Collection Method

This research is grounded on both raw data & second-party data collection by the researcher, the idol research requires both types of data, Primary data as well as Secondary data, So during the study, the researchers used both types of data for data collection. Secondary data was collected for depth knowledge from sources like websites, Journals as well as Internet.

Population

The Population for the study was Business, Students, Job, Self Employed and others.

Sampling Method

The researcher has used their convenient method for sampling or to collect responses from the samples.

Data Collection Instrument

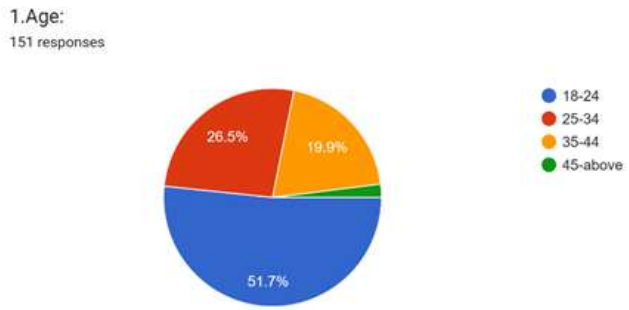
The study purposed to collect primary data through a questionnaire using the survey method to give precise, accurate, realistic, and relevant data.

Sample Size

Up to 150 Responses are collect

VI. 8 Data Analysis and Interpretation:

Graphic illustration



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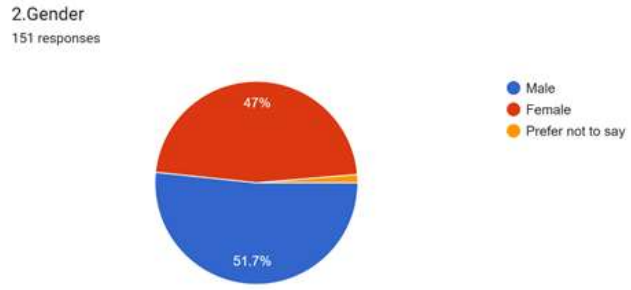
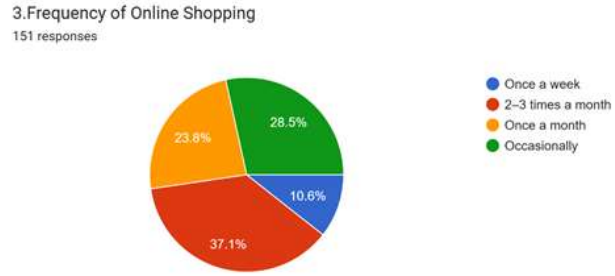
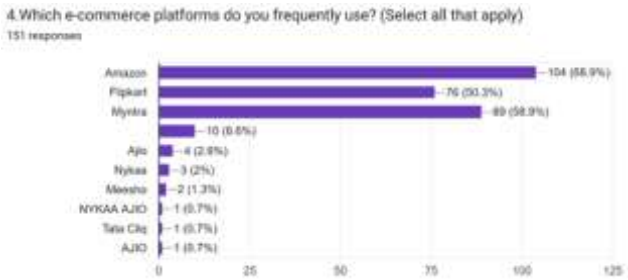
Analysis: From the above chart researchers have found that the age group between 18-24 has a large number of respondents 51.7%, followed by the age group between 25-34 years carrying 26.5%. with 19.9% of the age group between 35-45 years carrying the third rank and 2% carrying 45 above.



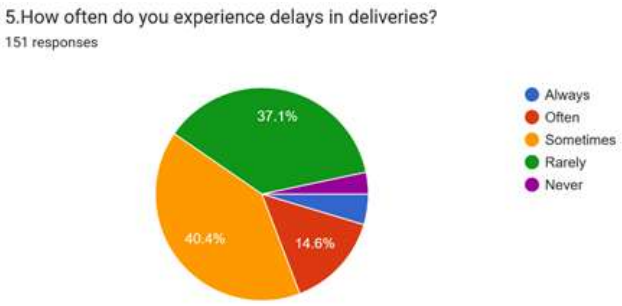
Analysis: From the above chart researchers have found that the male responds were 51.7% out of total number of responds and remaining were female respondents which were 47%.



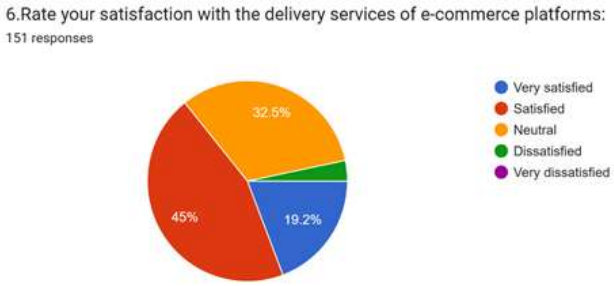
Analysis: From the above chart researchers have found that most of the people shop online is 2-3 times a week at the percentage of 37.1%. After that people vote for occasional basis is 28.5%. And people shop once a month are 23.8% and once a week are 10.6%.



Analysis: From the above chart researchers have found that 68.9% of respondents buy products from amazon and 58.9% of respondent usually prefer shopping from myntra and rest 50.3% prefer to shop from flipkart.

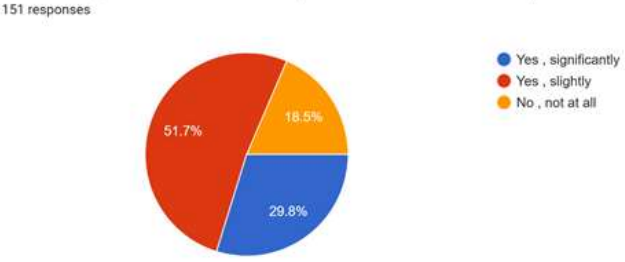


Analysis: From the above chart researchers have found that 40.4% of respondents sometimes experiences delayed deliveries. 37.1% of respondents rarely experiences delayed deliveries and 14.6% people often faces delayed deliveries.



Analysis: From the above chart researchers have found that 45% of respondents are satisfied with the delivery services and 32.5% people are neutral about it. 19.2% of the respondents are very satisfied about the delivery service by ecommerce platforms

Analysis: From the above chart researchers have found that 37.1% of respondents feels it is important for timely delivery and 35.1% people feels that timely delivery is very important. 23.2% of the respondents feels neutral about deliveries.

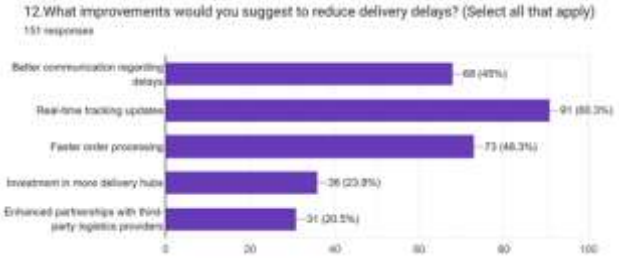


Analysis: From the above chart researchers have found that 51.7% of respondents slightly feels that delayed delivers influenced the trust in the ecommerce platform and 29.8% people significantly feels that delayed delivers influenced the trust in the ecommerce platform. 18.5% people feels nothing about it.

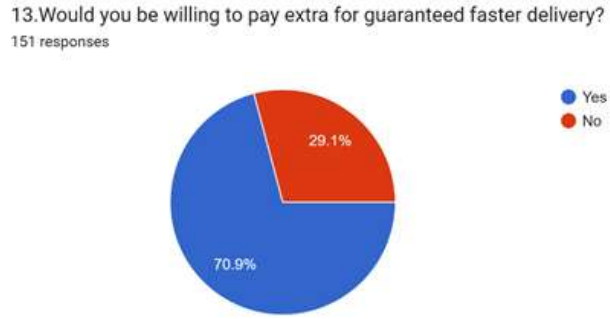
Analysis: From the above chart researchers have found that 68.9% of respondents have cancelled an order due to delayed deliveries and 31.1% didn't cancelled the order.

Analysis: From the above chart 46.4% of respondents thinks the main reason for delayed delivers is high volume of orders. 45.7% respondents thinks the reason is issues with third party logistics providers and 44.4% of people thinks the reason of natural or external factors.

Analysis: From the above chart researchers have found that 37.7% of respondents sometimes get delayed delivery order during major sale events. 27.2% of respondent often get delayed deliveries. 25.2% of people rarely face delayed deliveries during major sale events.

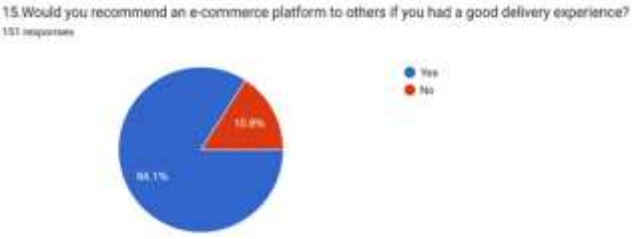


Analysis: From the above chart researchers have found that for improvement to reduce delivery delay 60.3% people choose real time tracking. 48.3% respondents choose faster order processing and 45% opt for better communication. 23.8% of respondent have suggested to invest more in delivery hubs.



Analysis: From the above chart researchers have found that 70.9% of respondents are willing to pay extra for guaranteed faster delivery and 29.1% respondents doesn't like to pat extra.

Analysis: 87.4% of respondents opt yes as they believe in offering flexible delivery slots as satisfactory. 12.6% of respondent opt no as they believe in offering flexible delivery slots as satisfactory.



Analysis: 84.1% yes people would recommend an ecommerce platform to others if they had a good delivery experience. And 15.9% people feel that they wouldn't recommend an ecommerce platform to others if they had a good delivery experience.

VI. RESULTS AND FINDINGS

1. Demographic Insights

- A significant portion (51.3%) of respondents are aged 18–24, indicating strong e-commerce engagement among young consumers.
- Gender distribution is balanced (51.3% male, 47.3% female).
- 37.3% shop online 2–3 times per month, showing high e-commerce reliance.

2. Most Used E-commerce Platforms

- Amazon (68.7%), Myntra (59.3%), and Flipkart (50.7%) dominate the market.
- Smaller platforms like Nykaa, Meesho, and Ajio cater to niche audiences.

3. Experience with Delivery Delays

- 40.7% face occasional delays, while 14% experience frequent delays.
- Only 3.3% never encountered a delay.

4. Customer Satisfaction with Deliveries

5. Importance of Timely Delivery

- 72% consider timely delivery crucial to their shopping experience.

6. Impact of Delays on Trust

- 81.3% experience some level of trust reduction due to delays.
- 29.3% report a significant decline in trust.

7. Order Cancellations Due to Delays

- 31.3% have cancelled orders due to delayed deliveries.

8. Major Reasons for Delays

- High demand during sales (46.7%), third-party logistics issues (46%), external factors (44.7%), and infrastructure gaps (34%) are key causes.

9. Delays During Sales & Festivals

- 74% face delays, with 38% occasionally, 27.3% often, and 8.7% usually experiencing them.

10. Suggested Improvements

- 60.7% want real-time tracking, 48.7% suggest faster order processing, and 44.7% seek better communication.

11. Willingness to Pay for Faster Delivery

- 70.7% are willing to pay extra for guaranteed faster delivery.

12. Importance of Flexible Delivery Slots

- 87.3% believe flexible delivery timing would enhance satisfaction.

Recommendations

Enhance Last-Mile Delivery Efficiency

- Invest in local distribution hubs and micro-fulfilment centres to speed up deliveries.
- Optimize delivery routes using AI and real-time tracking.

Strengthen Third-Party Logistics (3PL) Partnerships

- Establish clear service-level agreements (SLAs) to improve reliability.
- Use multiple logistics providers to reduce dependency on a single 3PL.

Improve Inventory & Warehouse Management

- Implement AI-driven demand forecasting to prevent stockouts and overstocking.
- Automate warehouse operations for faster order processing.

Optimize Delivery During Peak Seasons

- Expand temporary workforce and infrastructure during high-demand periods.
- Offer scheduled or delayed delivery options with incentives to manage volume.

Enhance Customer Communication & Transparency

- Provide real-time order tracking with proactive delay notifications.
- Improve customer support responsiveness to handle delivery issues effectively.

VII. CONCLUSION OF THE STUDY

The rapid growth of e-commerce has significantly transformed supply chain management, requiring businesses to adopt more agile, technology-driven, and customer-centric strategies. The study highlights that delivery efficiency, inventory management, and last-mile logistics are critical factors influencing customer satisfaction. Challenges such as delays, 3PL inefficiencies, and seasonal demand spikes continue to impact supply chain performance. To address these issues, businesses must invest in automation, optimize logistics networks, strengthen partnerships with 3PL providers, and enhance customer communication. Additionally, adopting sustainable practices and offering premium delivery options can further improve operational efficiency and customer experience. Ultimately, the study concludes that adapting to the evolving e-commerce landscape with smart supply chain innovations is essential for long-term success and competitiveness.

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