



**EAST BRIDGE
UNIVERSITY**
PARIS, FRANCE

Consumer Behavior Impact on Digital Transformation and Automation in Omni- Channel Fulfillment Systems.

**A Thesis Presented to
East Bridge University, Paris**

**In Partial Fulfillment of the Requirements of the
Executive Doctorate in
Business Administration**

**by
Krishna Kant Pandey
Sept 2025**

Title: Consumer Behavior Impact on Digital Transformation and Automation in Omni-Channel Fulfillment Systems.

Author: Krishna Kant Pandey

Research Committee:

Research Advisor/ Guide: Dr Saranya Desikan

EBU Representative: Dr Sanjib Chakraborty

Date: 15 Sept 2025

Declaration

I, **KRISHNA KANT PANDEY**, hereby declare that this thesis titled, “Consumer Behavior Impact on Digital Transformation and Automation in Omni-Channel Fulfillment Systems” is the outcome of my own study undertaken under the guidance of **DR SARANYA DESIKAN** at **EAST BRIDGE UNIVERSITY**. I also affirm that the work presented in this document has not been previously published or submitted in whole or in part, for any other degree, diploma or certificate awarded by this or any other university. I have duly acknowledged all the sources used by me in preparation of this thesis.

KRISHNA KANT PANDEY

15 Sept 2025

Acknowledgement

First and foremost, I express my deepest gratitude to the **Almighty** for granting me the opportunity, strength, patience, and perseverance to pick up and complete this research.

I express my gratitude to my research supervisor, **Dr Saranya**, for her unwavering guidance and insightful feedback throughout the research journey. Her expertise and mentorship have been instrumental in shaping the direction and quality of this work.

I am profoundly thankful to all the **industry professionals, survey respondents, and interview participants** who generously shared their time and insights. Their real-world perspectives greatly enriched this research and helped bridge the gap between theory and practice.

I offer heartfelt thanks to my **family and friends, especially my wife, Shobha, my daughter, Shiva, and our little one, Ayush**, for their unconditional love and motivation. Their encouragement has been a pillar of strength during moments of stress and uncertainty.

Lastly, I acknowledge the institutional support provided by my **university**, which facilitated access to resources and provided a nurturing environment for academic exploration.

This research would not have been possible without the collective contributions of all these individuals and institutions, to whom I am sincerely grateful.

Table of Contents

DeclarationIII

Acknowledgement..... IV

Table of Contents..... V

List of Tables..... VIII

List of Figures IX

List of Abbreviations..... X

Abstract..... XI

Chapter One: Introduction..... 1

1.1 Background of the Study..... 1

1.2 Rationale of the Study.....1

1.3 Problem Statement,..... 1

1.4 Theoretical Framework - A Brief Summary 2

1.5 Significance of this Research..... 2

1.6 Research Aim.....2

1.7 Research Objectives..... 2

1.8 Thesis Organization 2

1.9 Summary of Chapter One..... 3

Chapter Two: Review of Literature..... 5

2.1 Introduction..... 5

2.1.1 Keywords 5

2.1.2 Search Engines and Databases Used 5

2.1.3 Timeline of Literature 5

2.1.4 Review Process 5

2.2 Omni Channel Fulfillment: An Overview..... 5

2.3 Customer expectations in the digital era..... 6

2.4 Role of Automation in Omni-Channel Fulfillment..... 6

2.5 Real-Time Tracking and Predictive Delivery..... 6

2.6 Barriers to Automation and Digital Transformation..... 6

2.6.1 Internal Barriers..... 6

2.6.2 External Barriers....., 7

2.7 Research Gap 7

2.8 Research Objectives 7

2.9 Research Questions 7

2.10 Conclusion7

Chapter Three: Research Methodology..... 8

3.1 Outline of the Chapter..... 8

3.2 Research Questions..... 8

3.3 Research Objectives..... 8

3.4 Research Design.....8

3.5 Theoretical Framework and Research Methodology8

3.6 Research Site..... 9

3.7 Research Participants..... 9

3.8 Sample Size.....10

3.9 Sample Technique.....10

3,10 Data-collection Method.....10

3.11 Research Process.....10

3.12 Research Reflexivity.....10

3.13 Ethical Considerations.....10

3.14 Data Analysis.....11

3.15 Summary of Chapter Three.....11

Chapter Four: Research Findings and Data Analysis 13

4.1 Outline of the Chapter 13

4.2 Qualitative analysis (Source: Interviews) 13

4.2.1 Research Question One..... 13

4.2.1.1 How have customer expectations for faster delivery changed over time?..... 13

4.2.1.2 What automation tools or systems have you started using to meet expectations /demand? 14

4.2.2 Research Question Two..... 15

4.2.2.1 Have you implemented real-time tracking or predictive delivery features into your fulfilment process? If so, how?..... 15

4.2.2.2 What role do you think these tools play in the overall customer experience?..... 16

4.2.3 Research Question Three..... 16

4.2.3.1 What internal or external challenges do you face when implementing automated solutions?..... 16

4.2.3.2 What strategies have been most effective in increasing adoption and seamless implementation?..... 17

4.2.4 Summary of Qualitative Analysis (Source: Interviews) 18

4.3 Descriptive Analysis (Source: Consumer Survey) 18

4.3.1 Research Question One..... 18

4.3.1.1 Data Analysis.....

4.3.1.2 Interpretation.....

4.3.1.3 Overall Insight..... 21

4.3.1.4 Conclusion..... 21

4.3.2 Research Question Two..... 21

4.3.2.1 Data Analysis.....

4.3.2.2 Interpretation..... 25

4.3.2.3 Combined Insights.....

4.3.2.4 Conclusion..... 25

4.3.3 Research Question Three..... 25

4.3.3.1 Data Analysis.....

4.3.3.2 Interpretation..... 28

4.3.3.3 Strategic recommendations to mitigate barriers..... 28

4.3.4 Summary of Quantitative Analysis (Source: Consumers Survey).....

4.4 Descriptive Analysis (Source: Business Surveys)..... 28

4.4.1 Research Question One..... 28

4.4.1.1 Data Analysis.....

4.4.1.2 Conclusion..... 31

4.4.2 Research Question Two..... 32

4.4.2.1 Data Analysis.....

4.4.2.2 Interpretation 34

4.4.2.3 Combined Insights 34

	4.4.2.4	Conclusion	
35			
	4.4.3	Research Question Three	35
	4.4.3.1	Data Analysis	
35			
	4.4.3.2	Interpretations and Key Insights	36
	4.4.3.3	Recommendations for strategic digital transformation in Omni channel fulfillment and logistics	36
	4.4.4	Summary of Quantitative Analysis (source: Business Surveys)	36
4.5		Mixed-Method Analysis -Qualitative and Quantitative (Source: Case Studies) ..	
36			
	4.5.1	Research Question One	37
	4.5.1.1	Example of Reliance Retail Ltd	
37			
	4.5.1.2	An Example of Flipkart	37
	4.5.1.3	A Case Study of Swiggy India	38
	4.5.1.4	A case study at Amazon India and the Middle East	38
	4.5.1.5	A Study of Talabat in the GCC	
38			
	4.5.1.6	Example at Noon in the GCC	39
	4.5.2	Research Question Two	39
	4.5.2.1	A Case Study on Reliance Retail Ltd	
39			
	4.5.2.2	Example of Flipkart	40
	4.5.2.3	Swiggy India at a look	
40			
	4.5.2.4	A case study of Amazon India and the Middle East.....	40
	4.5.2.5	An example of Talabat in the GCC	
40			
	4.5.2.6	A Case Study of Noon in the GCC	
41			
	4.5.3	Research Question Three	41
	4.5.3.1	Study at Reliance Retail Ltd	
41			
	4.5.3.2	A Study of Flipkart	
42			
	4.5.3.3	A Study of Swiggy India	42
	4.5.3.4	A look at Amazon in India and the Middle East	42
	4.5.3.5	Example at Talabat in the GCC	43
	4.5.3.6	A Case Study at Noon in the GCC	
43			
	4.5.4	Summary of Mixed-Method Analysis (Source: Case Studies)	44
4.6		Summary of Chapter Four	44
	Chapter Five: Conclusion		46
	5.1	Summary of the Whole Research	46
	5.2	Reiterate the Key Findings and Analysis	47
	5.3	Contributions to the Existing Body of Knowledge.....	47
	5.4	Limitations of the Present Study	47
	5.5	Implications	47
	5.6	Recommendations	48
	5.7	Future Scope of the Study	48
	5.8	Final Thoughts	48
	Glossary		49
	References		51

Appendices

Appendix 1: Consent Form 56

Appendix 2: Interview Schedule ... 57

Appendix 3: Survey Questionnaire – Consumer 58

Appendix 4: Survey Questionnaire – Business 59

Appendix 5: Ethical Consideration 60

Appendix 6: Survey Invitation on LinkedIn 61

List of Tables

Table 1 - How important is fast delivery in your online shopping experience? 19

Table 2 - How satisfied are you with personalization? 19

Table 3 - Have you noticed improvements in delivery speed over the last year? 20

Table 4- Does faster delivery influence your decision to buy from a specific brand or platform? 20

Table 5 - Do you prefer retailers that offer real-time delivery tracking? 22

Table 6 - How satisfied are you with the accuracy of tracking systems? 23

Table 7- Does tracking information affect your likelihood to order again from the same retailer? . 24

Table 8 - how useful do you find predictive delivery updates (e.g., “Delivered by tomorrow before 4 PM”)? 24

Table 9 – How comfortable are you using automated services such as chatbots, smart lockers, or delivery alerts?27

Table 10 - What could be your main concerns with automated fulfillment systems? 27

Table 11 - What would make you feel more comfortable using automation? 28

Table 12 - Has your company adopted automation technologies in response to changing consumer demands? 30

Table 13 - If yes, what were the main drivers behind adopting automation? 31

Table 14 - How strongly have consumer expectations influenced your automation strategy? 31

Table 15 – Has your organization adopted real-time tracking or predictive delivery systems? ... 33

Table 16 – After implementation, how would you rate the change in customer satisfaction? 33

Table 17 - What benefits have you observed since adopting these tools? 34

List of Figures

Figure 1 - How important is fast delivery in your online shopping experience? 19

Figure 2 -How satisfied are you with personalization? 20

Figure 3 – Does faster delivery influence your decision to buy from a specific brand or platform?20

Figure 4 – Do you prefer retailers that offer real-time delivery tracking? 23

Figure 5 – How satisfied are you with the accuracy of tracking systems? 23

Figure 6-Does tracking information affect your likelihood to order again from the same retailer?..24

Figure 7- How useful do you find predictive delivery updates (e.g., “Delivered by tomorrow before 4 PM”)? 25

Figure 8 - How comfortable are you using automated services such as chatbots, smart lockers, or delivery alerts? 27

Figure 9 - Has your company adopted automation technologies in response to changing consumer demands?30

Figure 10 - How strongly have consumer expectations influenced your automation strategy? ..31

Figure 11 – Has your organization adopted real-time tracking or predictive delivery systems? 33

Figure 12 – After implementation, how would you rate the change in customer satisfaction?33

List of Abbreviations

API -Application Programming Interface
AI -Artificial Intelligence
AGV- Automated Guided Vehicle
ARS – Auto Replenishment System
B2B -Business to Business
COD- Cash on Delivery
CRM – Customer Relationship Management
CX- Customer Experience
DOD -Demand Draft on Delivery
DWS -Dimensioning, Weighing, and Scanning
EAN – European Article Number
ETA – Expected Date of Arrival
F&R- Forecasting and Replenishment
FAQ – Frequently Asked Questions
GDPR- General Data Protection Regulation
GTP -Goods to Person
GOV- Gross Order Value
GPS- Global Positioning System
HHD -Handheld Device
INR- Indian Rupee
IOT -Internet of Things
JMP -JioMart Partner
L&D- Learning and Development
MENA – Middle East and North Africa
ML- Machine Learning
NPS- Net Promoter Score
OMS- Order Management System
PTG- Person to Goods
POS- Point of Sale
PO- Purchase Order
POD- Proof of Delivery
RBV- Resource-Based View
RFID -Radio Frequency Identification
ROI- Return on Investment
RQ -Research Question
SME- Small and Medium Size Entrepreneur
SFS- Ship from Store
TAM -Technology Acceptance Model
TAT- Turnaround Time
TMS- Transport Management System
UTAUT- Unified Theory of Acceptance and Use of Technology
UI/UX- User Interface, User Experience
WIS- Warehouse Intelligence System
WMS- Warehouse Management System

Abstract

The evolution of consumer expectations for faster delivery and more personalized experiences has influenced the adoption of digital transformation and automation technologies in omni-channel fulfillment significantly. This study investigates how retail, e-commerce, and logistics management companies are leveraging technologies such as artificial intelligence (AI), machine learning (ML), real-time tracking, and predictive analytics to meet rising demands, enhance operational efficiency, and improve customer satisfaction. A mixed-methods approach was employed, integrating quantitative data from 118 survey respondents of India and the Middle East from different age groups, professions, and demographics with qualitative insights from semi-structured interviews with five professionals, and case studies of six leading companies from India and the Middle East, such as Amazon, Reliance Retail, Flipkart, Swiggy, and Noon.

The findings indicate that automation tools, including OMS (Order Management System), WMS (Warehouse Management Systems), ARS (Auto Replenishment System), TMS (Transport Management Systems), and AI-driven personalization, significantly impact customer satisfaction, trust, and loyalty, contributing to repeat purchases. However, challenges persist in the form of legacy system integration, workforce resistance, infrastructure limitations, and data privacy concerns.

The study further explores mitigation strategies and best practices such as localized interfaces, workforce training, and phased rollouts to enable smoother digital transitions. By aligning technology with people and processes, businesses can gain a competitive edge in today's hyper-demanding retail landscape.

This research contributes to the growing body of literature on digital supply chains and logistics, offering practical strategies and theoretical insights for navigating the future of the omni-channel fulfillment system.

Chapter One: Introduction

1.1 Background of the study

The emergence of omni-channel fulfillment models in retailing and e-commerce has reshaped consumer expectations around delivery speed, personalization, and visibility. With increasing best practices of digital transformation, consumers no longer see fast or customized service as a luxury but as a standard. Technologies such as automation, artificial intelligence (AI), real-time tracking, and predictive analytics are increasingly being adopted to meet these growing expectations (Christopher & Peck, 2020). Retailers are now reimagining their fulfillment ecosystems to be not only efficient but also responsive and customer-centric (Hübner, Wollenburg, & Holzapfel, 2016).

In India, the evolution of logistics and fulfillment has moved rapidly from manual delivery models to tech-enabled, real-time, and hyperlocal systems. Companies like Gati have pioneered door-to-door pick-up and delivery with time-bound delivery services since 1989, laying the foundation for organized logistics (Gupta, 2019). More recently, e-commerce players like JioMart, Flipkart, Zepto, Swiggy, and Amazon India have driven digital transformation through automation, last-mile optimization, and AI-based demand forecasting (EY India, 2022).

Similarly, in the Middle East, Noon, Talabat, and Amazon have accelerated the region's logistics digitalization, leveraging AI and robotics to enhance delivery efficiency and consumer experience (DHL, 2023). However, despite significant technological progress, gaps remain in adoption, consumer satisfaction, and seamless integration—particularly in areas such as personalization, last-mile reliability, and user trust in automation (PwC, 2022).

1.2 Rationale of the Study

In recent years, the rapid evolution of consumer behavior driven by digital adoption, mobile-first experiences, and ultra-fast delivery expectations has significantly transformed the landscape of retail, e-commerce, and supply chain operations (McKinsey & Company, 2023). Customers now demand not just fast delivery, but also real-time tracking, personalized experiences, and flexibility in fulfillment options (Verhoef et al., 2021). These expectations have compelled organizations to adopt digital transformation strategies and automation technologies across the entire supply chain, especially in omni-channel environments (Hübner, Wollenburg, & Holzapfel, 2016).

This study is significant because it addresses a pressing industry need: how organizations can align their supply chain capabilities with evolving customer expectations through technology-driven fulfillment. While many companies have adopted systems like WMS, TMS, OMS, and tools such as RFID, pick-to-light, and automated sortation, there remains a gap in understanding the strategic, operational, and behavioral challenges that influence successful implementation (EY, 2022; Deloitte, 2023).

Additionally, the market has seen a rise in innovative delivery models, such as hyperlocal fulfillment, dark stores, and 10-minute delivery, which are reshaping traditional fulfillment strategies (KPMG, 2022). However, these models also introduce new complexities in terms of technology integration, workforce readiness, and customer trust in automation (PwC, 2022).

The rationale for this study, therefore, lies in:

- Exploring how digital transformation and automation impact omni-fulfillment efficiency and customer satisfaction.
- Understanding the barriers (both internal and external) to successful tech adoption.
- Evaluating the strategies organizations use to mitigate these barriers and drive change.
- Providing a data-driven perspective through surveys on consumer expectations related to speed, personalization, and tracking.

By examining these dimensions, the study aims to contribute valuable insights for retail and supply chain leaders, policymakers, and technology providers to shape future-ready fulfillment ecosystems that are responsive, scalable, and customer-centric (Christopher & Peck, 2020; Accenture, 2023).

1.3 Problem Statement

While many organizations have adopted automation technologies, significant gaps remain in fully aligning these tools with changing consumer demands and omni-channel expectations (Hübner, Wollenburg, & Holzapfel, 2016). Existing literature highlights that real-time tracking, predictive delivery, and AI-driven visibility tools enhance operational transparency and customer satisfaction (Verhoef et al., 2021; McKinsey & Company, 2023). However, not all consumer groups respond equally to these technological features—variations in digital literacy, trust in automation, **and** delivery preferences continue to influence adoption outcomes (PwC, 2022; Accenture, 2023).

Despite the measurable benefits of digital fulfillment systems—including improved accuracy, speed, and customer engagement—many organizations face persistent internal and external barriers that prevent full-scale implementation. These barriers include integration challenges, high capital investment, legacy system constraints, and employee resistance to technological change (Deloitte, 2023; EY, 2022).

Accordingly, this study seeks to investigate three key dimensions of this gap:

1. How shifting consumer expectations for delivery speed and personalization influence automation adoption in omni-channel fulfillment.
2. How real-time tracking and predictive visibility tools affect consumer trust and loyalty.
3. What strategic, operational, and behavioral barriers exist in the adoption and scaling of digital fulfillment systems.

By addressing these issues, this research aims to provide actionable insights for organizations seeking to optimize customer satisfaction while overcoming transformation challenges in modern supply chain ecosystems.

1.4 Theoretical Framework - A Brief Summary

The research draws from the Technology Acceptance Model (TAM) (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) to understand user perception and adoption of logistics technologies. These models highlight key constructs such as perceived usefulness, ease of use, and behavioral intention, which are relevant to both consumer and organizational perspectives.

Additionally, the Resource-Based View (RBV) theory supports the argument that firms with superior technological capabilities (e.g., automation, tracking systems) gain competitive advantage by meeting customer expectations more efficiently (Barney, 1991).

The study adopted approach of mixed method research design combining qualitative and quantitative both with logic of derive a comprehensive and nuance understanding of the complex relations between evolving consumer expectations and adoption of digital transformation and automation in omni-channel fulfillment systems. According to Creswell, J. W., & Plano Clark, V. L. (2018), mixed methods are particularly effective in studying phenomena that involve both measurable outcomes and subjective human behaviors, which is central to this research.

1.5 Significance of this Research

As retail and eCommerce competition intensifies, customer-centric fulfillment and logistics have become critical to business success. This study is timely and relevant, offering insights for retail, eCommerce, Quick commerce and logistics organizations aiming to remain competitive through innovation. Understanding consumer expectations and aligning fulfillment technologies accordingly can result in enhanced customer satisfaction, increased loyalty, and operational efficiency.

Furthermore, identifying barriers to adoption and effective mitigation strategies can help organizations better manage the change process. This research also contributes to academic literature by providing a holistic view of the digital transformation of omni-channel Fulfillment and logistics in the Indian and Middle East context, a market experiencing both exponential growth and complex logistical challenges.

1.6 Research Aim

This study aims to examine the impact of digital transformation and technology automation on omni-channel fulfillment operations, with a specific focus on how these innovations influence consumer satisfaction, delivery speed, real-time tracking, and personalization.

The study also aims to explore the barriers and enablers associated with the adoption of digital technologies in the supply chain, and to identify strategic approaches that organizations can implement to overcome these challenges and enhance fulfillment efficiency in a rapidly evolving retail environment.

1.7 Research Objectives

The primary objectives of this study are to:

- Examine the changing dynamics of consumer expectations with respect to delivery speed, personalization, and real-time visibility in omni-channel fulfillment systems.
- Assess how effectively businesses utilize digital tools and automation technologies (such as real-time tracking, predictive delivery, and AI-enabled fulfillment systems) to meet these evolving expectations.
- Evaluate the impact of tracking and predictive delivery technologies on overall consumer satisfaction, trust, and loyalty.
- Identify the key internal and external barriers affecting the adoption and integration of automation in omni-channel operations.
- Propose practical and data-driven strategies for successful digital transformation and automation enablement within omni-channel fulfillment environments.

1.8 Thesis Organisation

This thesis is structured as follows: Chapter one begins with an introduction that presents the background of the study, research problem, objectives, research questions, rationale, and thesis structure. Chapter two presents a literature review and critically reviews the existing literature on Omni-channel fulfillment and logistics, consumer expectations on delivery speed and personalization, and digital transformation strategies. Chapter three details the research methodology, which describes the research design, methodology and theoretical framework, research site, data collection methods, sampling strategy, ethical considerations, research process, and analysis techniques. Chapter four analyzes results and presents the data from consumer survey, case studies, and interviews using charts, tables, graphs, thematic coding, and interpretation aligned with research questions and objectives. Chapter five provides a conclusion that summarizes the key insights and provides practical recommendations. This chapter also outlines limitations of the present study and suggests future research directions.

1.8.1 Research Questions

The study provides actionable insights overcoming barriers to adopt digital transformation and automation in omni-channel fulfillment, guided by the research questions as mentioned below

1. How do changing customer expectations for delivery speed and personalization affect the use of automation technologies in omni-channel fulfillment systems?
2. How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?
3. What makes it hard to use digital and automated fulfillment systems, and how can strategic digital transformation in omni-channel logistics help mitigate these problems?

1.9 Summary of Chapter One

This chapter introduces the study on the impact of digital transformation and automation in omni-channel fulfillment and logistics, focusing on India and the Middle East. It begins by highlighting how evolving consumer expectations for delivery speed, personalization, and visibility are pushing retailers, e-commerce, and logistics companies to adopt digital transformation and technology like AI, automation, and real-time tracking tools.

The study addresses the gap between adoption of technology and customer satisfaction, guided by three research questions related to digital transformation and automation, tracking tools, and adoption barriers.

The research is significant for helping retail, eCommerce, Quick-commerce and logistics firms improve customer experience and operational efficiency. The scope is limited to last-mile and order fulfillment technologies, excluding broader supply chain and rural logistics.

The chapter also outlines the thesis structure, covering background, literature review, methodology, framework, data analysis, and conclusions.

Chapter Two: Literature Review

2.1 Introduction

This chapter essentially reviews the existing body of literature related to consumer behavior and expectations for delivery and personalization, digital transformation and automation technology, omni-channel fulfillment, real-time tracking and predictive delivery tools, and organizations face the challenges in adoption. The review is structured to align with the objectives and the study's research questions. It covers relevant theoretical perspectives and identifies research gaps that is aimed to address in this study. It adopts a narrative review approach to synthesize and analyze critically existing academic and industry research on the adoption of digital transformation and technology automation in modern e-commerce and retail fulfillment systems.

2.1.1 Keywords

A set of relevant keywords was used in search process, these included Digital Transformation in eCommerce and retail, Technology Automation in the Fulfillment Centers, Customer experience in eCommerce, Last-mile Delivery, Supply Chain Integration, API in fulfillment operations, Dark Stores, Hyperlocal services, Control Tower Dashboards, Technology Acceptance Model (TAM), and Kotter's Change Model.

2.1.2 Search Engines and Databases Used

A structured search strategy was employed across multiple academic and industry databases to capture both theoretical and applied perspectives. The following search engines and databases were used: Scopus, Google Scholar, Scopus, ScienceDirect, IEEE Xplore, SpringerLink, ProQuest, EBSCOhost, Harvard Business Review (HBR), Industry white papers (McKinsey, Deloitte, Gartner).

2.1.3 Timeline of Literature

A period of 15 years from 2010 to 2025 was reviewed to capture the fundamental theory and advancements in technology, digital transformation, and supply chain innovation in retail and omni-channel fulfillment. Though a portion of data was captured for the last 30 years to know the trend of delivery services, priority was given to research published in the last **5–7** years, especially post-COVID-19, considering the rapid acceleration in e-commerce and automation adoption.

2.1.4 Review Process

The review process involves the stages of Initial Search and Screening, where keywords were applied to the database search and relevant articles were shortlisted, and title and abstracts were reviewed first, followed by analysis in detail by full-text. Inclusion Criteria stage for industry reports, peer-reviewed journal articles with a focus on digital transformation, automation in Omni-Fulfillment, or change and acceptance of automation technology were included. Exclusion Criteria: articles not published in English, Older than 2010, or not relevant to the domain. Thematic Categorization literature was categorized into themes of theoretical models (TAM and Kotter), Digital transformation in retail fulfillment and logistics, automation technology, supply chain visibility, and customer-centric fulfillment. Synthesis stage for gaps, key findings, and interconnection among themes to inform the theoretical framework and practical implications of the research.

2.2 Omni-Channel Fulfillment: An Overview

Omni-channel retail refers to the seamless integration of all physical and digital retail touchpoints to offer customers a consistent and personalized experience (Verhoef et al., 2015). Fulfillment in this context includes order processing, inventory management, packaging, shipping, and last-mile delivery across multiple platforms (Hübner et al., 2016).

Recent advancements have shifted the traditional single-channel supply chains toward dynamic, customer-centric networks. Concepts like SFS (ship-from-store), dropship, dark stores, click-and-collect, endless-aisle, and hyperlocal are now critical features of omni-channel fulfillment. These models rely heavily on real-time data and automation to function efficiently (Piotrowicz & Cuthbertson, 2014).

2.3 Consumer Expectations in the Digital Era

The digital transformation of retail has heightened customer expectations, especially regarding speed, convenience, and personalization (Grewal et al., 2017). Consumers increasingly expect same-day or next-day delivery, real-time visibility into orders, and product recommendations tailored to their preferences.

Several studies highlight that delivery speed is no longer a competitive advantage but a baseline expectation (Huang & Van Mieghem, 2014). Similarly, personalization is becoming essential to customer retention, with consumers preferring brands that offer individualized experiences (Kaplan & Haenlein, 2019).

However, gaps remain between expectation and satisfaction. Research indicates that while brands may claim to offer personalization, the actual impact on consumer perception varies, especially in regions like Asia where digital maturity differs by demographic (Deloitte, 2021).

2.4 Role of Automation in Omni-Channel Fulfillment

Automation plays a central role in meeting these heightened expectations. Technologies such as robotic picking systems, real-time inventory synchronization, automated sortation, and AI-driven order management systems have transformed how fulfillment is managed (Wamba et al., 2017).

According to Deloitte (2020), automation improves order accuracy, reduces turnaround time, and enables scaling during high-demand periods. Tools like pick-to-light, put-to-light, auto-sortation systems, and voice-picking are also helping companies manage labor shortages and rising operational costs, especially in high-volume fulfillment centers.

However, the degree of automation differs. Though large retailers adopt high-end solutions like robotic fulfillment, Goods-to-person (GTP), Digital twin, and AI-driven forecasting, mid-tier businesses often face cost and integration challenges (Baryannis et al., 2019).

2.5 Real-Time Tracking and Predictive Delivery

Real-time delivery tracking and predictive analytics are now considered essential for building trust and transparency in logistics (Yu et al., 2018). Consumers increasingly rely on Estimated Time of Arrival (ETA) updates, SMS notifications, and GPS tracking to monitor their orders.

A McKinsey report (2021) found that over 80% of customers are more likely to repurchase from brands offering real-time delivery updates. Predictive tools enhance consumer control and reduce the need for support center interactions (Chopra & Meindl, 2016).

These tools also benefit businesses by reducing delivery failures, enabling route optimization, and improving customer satisfaction metrics. Yet, the adoption and perceived accuracy of such

systems differ across consumer groups, highlighting the importance of user-centric design and demographic sensitivity (Rai et al., 2019).

2.6 Barriers to Automation and Digital Transformation

In spite of the clear benefits, there are several barriers that hinder the successful adoption of automation technology and digital tools in omni-channel fulfillment and logistics. These barriers can be categorized into two parts: internal, external barriers, and technological challenges.

2.6.1 Internal Barriers

- **Cost and ROI Concerns** are the most common barriers as many organizations struggle to justify the upfront cost of automation, especially when ROI is not immediate (Davenport & Ronanki, 2018).
- **Change Resistance** is faced as employees often resist digital tools because of fear of redundancy or lack of familiarity (Kotter, 1996).
- **Integration Complexity** is a genuine concern for change in technology as existing legacy systems make it difficult to integrate new technologies smoothly because it requires significant IT effort (Zhang et al., 2020).

2.6.2 External Barriers

- **Vendor Reliability** is critical, especially in scenarios where dependence on third-party technology providers can introduce reliability issues.
- **Regulatory Compliance** is an external challenge, i.e., data privacy laws, especially under GDPR (General Data Protection Regulation) like frameworks, may delay or restrict deployment.
- **Market Volatility** affects volume variability, resulting in fluctuating demand and supply chain disruptions, hindering consistent automation benefits (Ivanov, 2020).

2.7 Research Gap

While previous studies have explored automation in Fulfillment/logistics and customer satisfaction separately, few have integrated the two within an Indian and Middle-Eastern omni-channel context using a mixed-method approach. There is limited research on how real-time tracking and predictive delivery impact different demographic segments. Moreover, the barriers to automation adoption in emerging markets, especially in rural areas of India and the Middle East, as perceived by both businesses and consumers, remain underexplored.

This study addresses these gaps by combining survey data, case study evidence, and interview insights to offer a comprehensive understanding of digital transformation in omni-channel fulfillment.

2.8 Research Objectives

The research set out to explore how the omni-channel fulfillment landscape evolved with the use of digital transformation and technology automation. The study aimed specifically to understand the drive of adoption of automation in order fulfillment operations by rising customer expectations and examining the impact of implemented tools like real-time tracking, predictive analytics, and personalization on consumer behavior and overall satisfaction. The study also aimed to identify the barriers/challenges being faced in implementing technology automation, and offer mitigation and effective strategies for digital transformation. The objectives were framed around three central RQs (research questions) as mentioned below

2.9 Research Questions

The study provides actionable insights overcoming barriers to adopt digital transformation and automation in omni-channel fulfillment, guided by the research questions as mentioned below

4. How do changing customer expectations for delivery speed and personalization affect the use of automation technologies in omni-channel fulfillment systems?
5. How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?
6. What makes it hard to use digital and automated fulfillment systems, and how can strategic digital transformation in omni-channel logistics help mitigate these problems?

2.10 Conclusion

This chapter reviewed literature on omni-channel fulfillment, evolving customer expectations, the role of automation, and the importance of real-time tracking and predictive delivery tools. It also discussed barriers to digital transformation and theoretical frameworks guiding the study. The gaps identified in the literature affirm the relevance and originality of this research.

Chapter Three: Research Methodology

3.1 Outline of the Chapter

This presents the methodology and research design for data collection and investigation on digital transformation and technology automation that reshape the omni-channel fulfillment. This explains the logic about the mixed method approach, and data collection techniques, such as qualitative, quantitative, and hybrid data collections by interview, sampling strategy, and case studies.

3.2 Research Questions

The study provides actionable insights on the topic of Consumer Behavior Impact on Digital Transformation and Automation in Omni-Channel Fulfillment Systems, guided by three research questions as mentioned below

RQ1: How do changing customer expectations for delivery speed and personalisation affect the use of automation technologies in omni-channel fulfillment systems?

RQ2: How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?

RQ3: What makes it hard to use digital and automated fulfillment systems, and how can strategic digital transformation in omni-channel logistics help mitigate these problems?

3.3 Research Objectives

To examine the change in consumer expectations in terms of speed and personalization and assess effective use of tools by businesses, including AI, ML, AR, IOT, and key automation strategies such as WMS, OMS, TMS, ARS, hybrid fulfillment model, and hyperlocal delivery technology to improve operations effectiveness, customer satisfaction, and brand loyalty in retail and eCommerce industries. To evaluate the value addition of tracking and predictive delivery technology on consumer behavior, satisfaction, trust on brand and enhancing repeat purchase decision of the consumers. Identifying the barriers (internal and external) for adoption of the automation, such as cost, system integration, regulatory challenges, and employee resistance, and propose practical strategies and the best practices for successful digital transformation and automation in omni-channel fulfillment systems including change management, staff training, user centric interface design, and phased rollouts.

3.4 Research Design

The study employs a mixed method designs covering interview, survey and case studies with combine approach of qualitative and quantitative. Survey helps for quantitative data and quantitative insights come from interview and case studies. The design allows for triangulation for data integration that enhance the validity and depth information. While quantitative data

captures the patterns in consumer behavior and preferences, qualitative data provides deeper understanding on operational practicalities from professionals. The mixed methods are suited for complex research, evolving subjects like digital transformation and technology automation in omni channel fulfilment (Creswell, 2014)

3.5 Theoretical Framework and Research Methodology

The study adopted approach of mixed method research design combining qualitative and quantitative both with logic of derive a comprehensive and nuance understanding of the complex relations between evolving consumer expectations, and adoption of digital transformation and automation technology omni-channel fulfilment systems. According to Creswell and Plano Clark (2018), mixed methods are particularly effective in studying phenomena that involve both measurable outcomes and subjective human behaviors, which is central to this research.

The method of semi-structured interviews was used with five supply chain and logistics professionals to explore strategic and operational insights. The online survey with sample size of 118 people targeted to understand the consumers behavior, expectations and perceptions around digital transformation, technology automation, and delivery. Also, the survey from businesses was done to find the statistics of use of technology, and barriers to the adoption. The survey was designed for a quantitative measure of consumer expectations on delivery speed and personalization, preference of real-time tracking and predictive delivery, satisfaction status, and trust in the automated fulfilment system.

Surveys provide statistically reliable insights and enable generalization within defined populations (Bryman, 2016).

In the study, quantitative data provides an evaluation of the pattern, such as % of customers who valued same-day delivery, the influence of visibility on brand loyalty, and the comfort level on automation. Data was collected on set questions using Google Form.

Using Likert-scale items and multiple-choice questions allowed for the quantification of consumer sentiment and behavior (Saunders, Lewis, & Thornhill, 2019).

Case studies help in-depth analysis of companies to ground findings in real-world practice. The method interview, survey, and case studies justify by offering operational perspectives that numerical data alone can't capture, enabling the identification of broader consumer trends that are generalizable, and providing context-specific understanding, respectively. Interviews provided qualitative data, surveys from consumers and businesses helped collect the quantitative insights, and case studies were used for collecting both qualitative and quantitative information. A collection of mixed data covering various industries, geography, and demography made the findings more relevant. However, each method has its limitations. Hence, triangulation (data integration) is done to address the potential for bias in interview responses. A mix of age groups, professions, and regions is involved in survey to ensure varied perspectives as the survey sample may not be nationally representative. Eventually, in spite of limitations, the combination of methods ensures depth, breadth, and reliability of information.

Case studies are effective in exploring "how" and "why" questions in real-life organizational contexts (Yin, 2018). They provided depth to the quantitative data by illustrating how leading companies implement automation and respond to evolving consumer expectations. Semi-structured interviews allowed flexibility in exploring themes such as resistance to automation, workforce adaptation, and system integration challenges (Kvale & Brinkmann, 2015).

The research draws from the Technology Acceptance Model (TAM) (Davis, 1989) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) to understand user perception and adoption of logistics technologies. These models highlight key constructs such as perceived usefulness, ease of use, and behavioral intention, which are relevant to both consumer and organizational perspectives.

Additionally, the Resource-Based View (RBV) theory supports the argument that firms with superior technological capabilities (e.g., automation, tracking systems) gain a competitive advantage by meeting customer expectations more efficiently (Barney, 1991).

3.6 Research Site

The study focuses on India (especially urban areas that serve as major hubs for retail and e-commerce), and the Middle East (Major cities). Urban centers in India and bigger cities of the Middle East are driving demand for fast, tech-enabled fulfillment, making them ideal for studying the impact of digital transformation and technology automation. Companies like Talabat, Noon.com, and Amazon in the Middle East, and Blinkit, Zepto, Flipkart, Amazon, JioMart, and Adverb in India operate extensively in these environments, offering rich cases for analysis.

Relevance- Quick-commerce and tech-enabled fulfillment for e.g., Zepto, Blinkit, considering urban areas as a focal point. Companies like JioMart, Adverb operate in bigger cities where demand for delivery speed and automation technology is high. The Middle East is focal point for quick commerce and digital transformation (e.g., Talabat, Noon.com) with increasing customer expectation.

3.7 Research Participants

A diverse group of consumers aged 18 years and above participated in the survey, including students, working professionals, and entrepreneurs. The same age group of professionals participated in the Survey from the business side in India and the Middle East. Interviews were done with professionals from the Industries of Logistics and supply chain, Retail, e-commerce, and tech sectors. While consumers provide insights into the demand side, i.e., what they expect from fulfillment and technology, industry professionals share valuable views from the supply side, including challenges and practical considerations of implementing automation.

3.8 Sample Size

5 professionals were interviewed, having rich hands-on experience in supply chain, logistics, customer experience, and omni-channel. 118 valid survey responses (58 consumers and 60 businesses), providing a solid base for identifying trends. Case studies were done on 6 leading organizations, 3 from India, 2 from the Middle East, and 1 common from India and the Middle East, examined for real-life applications of technology. Such a mix ensures both quantitative breadth and qualitative depth.

3.9 Sample Technique

Survey with convenience sampling, using Google Forms. This was pragmatic for gathering diverse consumer and business opinions quickly. Interview with purposive sampling, focusing on professionals with relevant domain experience and expertise. Purposive sampling helped target rich insights from key informants (Palinkas et al., 2015)

3.10 Data-collection Methods

Data was collected by source of interview, Survey, and case studies. The survey data was collated using Google Forms, covering topics such as expectations around delivery speed, experiences with real-time tracking and predictive delivery, and comfort with automation and digital transformation. Interviews were conducted in a semi-structured format with open-ended questions and explored the trends, use of technology, barriers to digital transformation, and technology automation, and strategic solutions to mitigate the barriers. Case studies are done on the leading organizations based on reports available on official websites and other public portals.

3.11 Research Process

The research followed the key steps such as designing the topic and research questions, developing the sources of interviews, surveys, and case studies to find the qualitative and quantitative data with cross validations. Completed the case study first, followed by the survey and interview. Survey data was converted to a pivot table in Excel to analyze, using descriptive statistics, and coded interview transcripts thematically. Finally, integration of data from all sources is necessary to address the research questions.

3.12 Research Reflexivity

To enhance the credibility of the findings, remained conscious of potential biases that could arise from academic background and interest in technology and automation-driven systems by important measures, such as cross-validation of the findings from different sources like interviews, surveys, and case studies. Also, to encourage diverse perspectives, implemented open-ended interview questions and ensured anonymity for honest and open responses.

3.13 Ethical Considerations

Data was collected maintaining a high level of ethical standards throughout the research process, including information to the participants about the purpose of the study, and their choice to participate was voluntary. Overall, the research followed institutional ethical review protocols.

This research was conducted in adherence to high ethical standards to ensure integrity, transparency, and respect for all participants. Before data collection, participants were informed about the purpose, scope, and voluntary nature of the study, and their informed consent was obtained. Participants were assured that they could withdraw from the study at any stage without any consequence.

To maintain confidentiality and anonymity, no personally identifiable information was collected or disclosed. All responses were coded and analyzed in aggregate form. The collected data was securely stored in password-protected digital files accessible only to the researcher and used exclusively for academic purposes.

Additionally, measures were taken to minimize researcher bias during data collection, interpretation, and analysis by maintaining objectivity and adhering to established research protocols. The study complied with institutional ethical review and approval guidelines, ensuring the responsible and ethical handling of data throughout the research process.

3.14 Data Analysis

Quantitative method analyzed the data using descriptive statistics, including percentages, frequencies, and scales. The sample is converted to pivot and cross-tabulated results by gender, age, geography, industry, and profession to identify trends.

Using both primary and secondary data sources ensures methodological triangulation, which enhances the validity and reliability of findings (Creswell & Plano Clark, 2018).

For qualitative data, interview transcripts are thematically coded. The key themes include expectation on delivery speed and personalization, role of real time tracking and predictive delivery, automation challenges, and other gaps.

According to Kvale and Brinkmann (2015), semi-structured interviews allow flexibility in probing deeper into participant experiences and capturing the nuances of organizational practices.

Integration of data is done by triangulating (Interview, Survey, and Case Study) the findings of both quantitative and qualitative data to enrich and validate results. The chapter outlines how the research methodology and design are used to find the impact of consumers' behavior on digital transformation and technology automation on omni-channel fulfilment, which explains the rationale behind the chosen method, i.e., mixed-method approach, sample size, discussion

with professionals, the setting of the study, and the data collection techniques. In chapters 4 and 5, insights have been directly mapped to research questions, with a detailed discussion.

Secondary data helps validate primary research and provides historical and comparative context (Bryman, 2016)

3.15 Summary of Chapter Three

This chapter presents the methodology adopted to study the impact of consumer behavior on digital transformation and automation in omni-channel fulfillment across the market of India and the Middle East. There was a mixed-method approach used, with a combination of qualitative interviews, quantitative surveys, and case studies to ensure the insight in breadth and depth. The study is guided by 3 research questions, centered around consumer expectations for delivery speed and personalization, the role of real-time tracking and predictive delivery tools, and barriers to technology adoption.

The research design included the interviews with 5 experienced professionals (in the industries of Logistics management, retail, eCommerce, and technology), the surveys with 118 participants (58 and 60 respondents from consumers and businesses respectively), and case studies of 6 leading companies (3 from India, 2 from Middle East, and 1 common from both the geography) operating in omni channel fulfillment.

Purposive sampling for interviews and convenience sampling for surveys were included in the sampling techniques, and data were collected from various ways, such as using Google Forms for surveys, conducting semi-structured interviews, and leveraging publicly available materials for case studies.

Data was analyzed involving thematic coding, descriptive statistics, and data sources triangulation to enhance findings validation. This chapter addresses the ethical standards and research reflexivity maintained throughout. The chapter sets the methodology foundation for deeper analysis.

Chapter Four: Research Findings and Data Analysis

4.1 Outline of the Chapter

This presents the key outcomes from the Interview, Survey, and case studies covering India and the Middle East. Interviews have been conducted with 5 people of mid and senior leadership level from the Industries of Retail and e-commerce from the leading organizations like Gati, Snapdeal, Shopperstop, Omnivio, and Reliance Retail Ltd. The survey has been done from consumers and businesses, participated by 118 people from India and the Middle East, women and men of different age groups, and Industries. The case studies were undertaken of 6 companies from India and the Middle East, such as 3 of India (Reliance Retail Ltd, Flipkart, and Swiggy), 2 of the Middle East (Noon.com and Talabat), and 1 common company of India and the Middle East (Amazon) from the Industries of Retail, eCommerce / Quick-commerce.

There are 3 research questions (RQ), and qualitative and quantitative data have been collected for each RQ to provide a comprehensive understanding of the theme.

4.2 Qualitative analysis (Source: Interviews)

4.2.1 Research Question One: How do changing customer expectations for delivery speed and personalisation affect the use of automation technologies in omni-channel fulfilment systems?

4.2.1.1 How have customer expectations for faster delivery changed over time?

Customer expectations for delivery speed in India have undergone a transformational journey since the late 1980s. This evolution has been driven by market innovation, technological adoption, e-commerce growth, and rising consumer demand for convenience and speed.

Timeline of Key Milestones:

- Before 1989 – there was a manual and unstructured delivery model. There was no pickup or delivery from door to door. Consignors had to leave their goods at transport offices, and consignees had to pick them up at their destination branches. No set delivery dates. Customers often had to call the destination branches to find out where their package was.
- 1989: Gati Ltd. starts up with door-to-door and committed delivery. Mahendra Agarwal (former MD of TCI LTD) started Gati, which was the first company in India to offer door-to-door service with guaranteed delivery times. Their slogan, "On time, intact, or money back," set a new standard for the industry. Customers got a hard copy of the Proof of Delivery (POD), and if there were any delays, they got their full freight refund, which made them very happy.
- 1994 – Cash on Delivery (COD) / Demand Draft on Delivery (DOD) Services. Gati launched COD and DOD based on customer needs. It collected payments from consignees and remitted them to consignors along with the POD—blending logistics and financial trust.
- 1995: Competitors like Safexpress and AFL came into the market. Several competitors entered the market, but many left because they couldn't handle the network and operational issues. Safexpress is still a major player among the first companies to enter the market.
- In 1997, Gati started offering domestic air cargo services. Gati started offering air cargo within India to speed up deliveries between cities for shipments that needed to get there quickly.
- 2003: Tech Integration with GEMS (Gati Enterprise Management System) and Gati@web. GEMS connected more than 250 branches on Oracle, giving Gati real-time visibility, tracking, and operational control. This was a big step forward in technology for the Indian logistics industry.
- 2007–2010: Retail and eCommerce grow with the rise of retail chains and online shopping, people expected deliveries to take 4 to 6 days, which was considered fast at the time. Made secondary transportation services with a schedule and time slots for retail
- 2011–2015 – Shift Toward 2–3 Day Delivery Expectations - As online shopping matured, customers began demanding 2–3-day delivery as the new standard. There has been an emergence of startups in logistics for last-mile delivery.
- 2016–2019 – There was the induction of Same-Day / 4-Hour Delivery. Market leaders, such as Amazon, Flipkart, and Snapdeal, launched same-day and next-day delivery, pushing innovation in last-mile delivery. 4-hour express delivery models also began to emerge. Tech-based mile / hyperlocal delivery players have emerged.
- 2020 – Temporary Reset Due to COVID-19. During the pandemic, customer expectations have been briefly adjusted to longer timelines due to global issues.
- 2022 Onwards – Ultra-Fast Delivery & Quick Commerce have been focused more post-COVID, expectations have reached new heights, like 10-minute to 1-hour delivery is becoming the norm, initiated by Quick commerce players (e.g., Blinkit, Zepto). Other concepts like Dark stores, hyperlocal logistics, and tech-enabled last-mile delivery, Omni-channel models like ship-from-store and drop-shipping, and broader telecom and internet penetration enabling real-time demand have come up.

Conclusion

The delivery scene in India has changed from "no set timeline" to "delivery in less than 10 minutes." This change has been caused by new ideas in logistics, service models that put the customer first, and fast progress in technology. The journey from simple transportation to tech-enabled, real-time, hyperlocal fulfilment shows how logistics has become a key factor in modern business.

4.2.1.2 What automation tools or systems have you started using to meet expectations /demand?

The key automation tools and systems used in leading retail, e-commerce, and logistics organizations to meet rising customer expectations. Here's a structured overview of what tools are used:

- Order Management System
 - Order-taking App JMP, developed by JIO Platform,
 - Order management platform -Sterling,
 - Order processing -SAP,
 - API integration
- Warehouse management system
 - SAP is broadly used in the retail industry
 - Real-time inventory tracking,
 - Expiry management,
 - Product information for batch, expiry date, EAN, Bin tracking, etc
 - Zoning for fast, slow, and non-moving articles
 - Inventory slotting and productivity improvement
- Transport management system (TMS) to
 - Automate carrier selection,
 - Auto routing, Route optimization,
 - Real-time shipment tracking,
 - Improving delivery speed and cost efficiency.
- Auto replenishment- demand planning has been automated.
 - Technology company -F&R
 - Auto PO to supplier for primary replenishment.
 - Auto indent to the Fulfillment center for secondary replenishment
 - Inventory optimization
- Semi-automation fulfilment centers –
 - paperless operations -all activities on a scan-based, handheld device (HHD)
 - voice picking,
 - put-to-light,
 - pick-to-light,
 - Auto-sortation system
- Complete automation -Goods to person -Fulfillment center -
 - Robotic, Auto picking, and putaway.
 - Technology company -Adverb
- Omni fulfilment –
 - Order allocation with a hopping system,
 - Ship from Store (SFS),
 - Dark store
 - Drop ship – This helps the organization to leverage the inventory available at the supplier location by using its extended fulfillment center.
 - Endless Aisle – Converting offline customers for booking online orders and fulfilling from the nearest location as per inventory availability. This happens in the lifestyle segment when customers visit the store and there is a cut size.
- Other automation in the fulfillment center

- Auto DWS -Dimension and weigh scale Machine for master data management
- Packman for packaging optimization
- Seller panel – for onboarding sellers
- B2B portal – for supplier relationships

Summary

These tools collectively help improve speed, accuracy, visibility, and flexibility across supply chains. By integrating automation at every stage, from order intake to last-mile delivery, retailers and logistics companies are better equipped to meet modern consumer expectations and compete in a dynamic market.

4.2.2 Research Question Two: How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?

4.2.2.1 Have you implemented real-time tracking or predictive delivery features into your fulfilment process? If so, how?

As per an interview with 4 people, real-time tracking and predictive delivery features improve customer satisfaction, enhance visibility, and increase operational efficiency in the fulfillment process

- Real-time tracking
 - GPS-enabled tracking system- this is integrated through the transport fleet, fulfillment center, and customers to monitor live status of the vehicles at various stages i.e., in transit, and stop points.
 - API integration between the Order management system and the Last mile delivery platform is playing a key role in tracking the return and delivery journey end-to-end.
 - Auto SMS to customers- This is engaging customers after order placement by keeping the customers informed about the order status at different stages of order readiness, out of delivery, delivered, attempted but not delivered, and rescheduling.
- Predictive tracking
 - System has been developed to track orders as per AI-based predictive delivery algorithms
 - The predictive ETA (expected time of arrival) is shown to customers at checkout and updated dynamically.
- Control tower set up
 - Dashboard development for visibility and control JioMart has developed 200+ dashboards on Jio-Analytics
 - OMNIVIO has developed 150+ dashboards for its various customers as part of Omni-channel control tower initiatives.
 - Tracking the orders at each step from order booking, confirmation in the system, different stages of processing in fulfillment centers i.e., pick, pack, sortation, staging, and dispatch stages.
 - Development of BI – business intelligence system.
- Digital twin – WIS
 - AI-driven Warehouse intelligence system (WIS)
 - To monitor the movement of men and machines and improve productivity.
 - Monitor and control the power consumption

4.2.2.2 What role do you think these tools play in the overall customer experience?

As per the interview, the real-time tracking and predictive delivery tools play a key role in improving the customer experience positively in today's scenario of a fast-paced and expectation-driven market.

- Transparency and Trust – Customers are engaged by keeping them informed through SMS /WhatsApp at every stage of the order delivery journey. Real-time tracking

decreases the surprise about order status. Customers even support, even if delivery misses, with visibility of the delivery status. Predictive delivery offers a clear, accurate delivery timeline. This also helps build trust in the brand.

- This allows taking Control and Convenience, as with updates, customers can manage their time well, plan their day around the delivery. Moreover, there are some systems that even allow for delivery rescheduling, slotted delivery, or location changes, as per customer convenience, giving customers more control and flexibility.
- Relies on efficiency and professionalism - predictable deliveries, fast and accurate, indicate that a company is customer-centric and organized, giving an impression of being updated as per the current market situation, which positively influences customer loyalty and brand perception.
- Reduced queries – In the absence of a real-time tracking and predictive delivery system, customers used to contact due to no visibility. With the available tools, customers need to contact the support center less, as they can track orders and resolve issues on their own, which streamlines operations and improves overall service satisfaction.

Conclusion

The integration of real-time tracking and predictive delivery features is no longer optional; it has become a competitive necessity in modern fulfillment operations, as customers have tested the technology-based quick service level and now expect even more. These tools are not only improving internal efficiency but also delivering a seamless, transparent, and reliable experience to customers. These tools help increase consumer satisfaction, build trust, and ultimately drive loyalty through effective communication, reducing uncertainty, and taking greater control. Organizations are in increasing demand in the market that have invested in such technologies and positioned themselves as forward-thinking, customer-centric, and operationally agile.

4.2.3 Research Question Three: What makes it hard to use digital and automated fulfillment systems, and how can strategic digital transformation in omni-channel logistics help mitigate these problems?

4.2.3.1 What internal or external challenges do you face when implementing automated solutions?

As per interview inputs, there are various challenges reported internally and externally, although adopting automated solutions brings benefits for sure.

- Internal Challenges:
 - Automation needs a benefit analysis as it often involves substantial initial investment in terms of time and money. Hence, expecting quick ROI is sometimes challenging in scenarios of phased or complex implementations. In short, concerns of upfront cost and ROI.
 - System Integration Issues- many automated tools need to integrate with existing OMS, WMS, or ERP systems. It requires additional development effort in the scenario of legacy infrastructure to create compatibility or address data synchronization issues.
 - Data Quality – automation depends severely on accurate, clean data. Hence, inconsistent customer information, product specs, or inventory records are examples of poor data quality that can lead to unsuccessful processes or incorrect results.
 - When I say resistance to change in Management, it means that due to fear of unfamiliarity with technology or job risk, people resist adopting a new system. Hence, training is a key to the successful implementation of digital transformation and technology to gain acceptance of people.
- External challenges-
 - As technology is evolving across, the Vendor reliability is considered as one of the external challenges, especially when relying on third-party automation providers. The area of concern is poor support, delays, or outages on the third-party vendor side, which can affect operations internally and customer services.

- Adherence to regulatory compliance in terms of data protection, safety regulations, and industry-specific standards. Compliance sometimes slows down the deployment of automation in fulfillment and logistics.
- Supply Chain Volatility is an external disruption, e.g., demand spikes, supplier issues, or transportation delays can interfere with automated workflows that depend on reliable patterns.

In summary, though automation drives operational efficiency and improves delivery TAT (Turn Around Time), it must be implemented with proactive change management, strong data foundations, and careful planning to overcome internal resistance and external constraints.

4.2.3.2 What strategies have been most effective in increasing adoption and seamless implementation?

As per interview insights, the following strategies are found to be most effective to ensure successful adoption and smooth implementation of digital transformation and automation tools-

- As the success depends on the comfort level of the end users, it's advisable to involve end users early. One should engage frontline teams, planners, customer service reps, and warehouse staff early in the selection and testing phases. In the process, their feedback supports shaping practical solutions and surges buy-in from the start.
- Change management and clear communication play a key role in the implementation of automation and digital transformation. The focus is to make a conscious effort to communicate the purpose (*why*) of implementation, rather than the way (*how*) of doing it. Explaining the long-term benefits, like better performance, reduced manual workload, and fewer errors, helps overcome resistance.
- Rollout's step-by-step approach makes execution successful. Planning the implementation in a phased manner rather than deploying automation once and all, e.g., implementing pilot programs, starting with high-impact or low-risk areas. This allows the team to perfect the system before wider implementation and avoid disruption.
- Training is a key to success. There must be comprehensive training conducted, like offering user guides, hands-on training sessions, and ongoing support to assist teams to feel confident using the new tools. In some cases, assigning automation champions within departments to assist peers.
- Planning of system integration- to ensure a seamless experience, investing time in making sure the new automation tools integrate well with existing systems (e.g., ERP, CRM, WMS). Avoiding siloed systems to prevent inefficiencies down the line.
- Track metrics & communicate wins – Performance parameters improve if they are tracked. All participants were advised to measure and share performance improvements, such as faster turnaround times, reduced errors, or cost reduction, to show the value of automation. By doing so, the organization can build team momentum and reinforce adoption.

In summary, successful adoption of technology automation is driven by key strategies like integral planning, gradual rollout, people-centered change management, and clear communication.

4.2.4 Summary of Qualitative Analysis (Source: Interviews)

Customer expectations have evolved tremendously in India in terms of delivery speed. The shift in delivery model started in 1989 with initiative of door-to-door pick-up and delivery with committed date. Before 1989 there was no time bound delivery as well as door pick and door delivery services were not in existence, and today the consumer expectation has evolved for ultra-fast delivery model in 10-minutes, driving wide range adoption of digital transformation and technology automation in Omni channel fulfillment, such as warehouse management system (WMS), Transport management system (TMS), Order Management system (OMS),

Auto replenishment system (ARS), AI based tools for real time tracking, control tower analytics, Warehouse intelligence system (WIS) and advance automation from Person to goods (P2G) to Goods to Person (G2P). Technology adoption has become essential to meet the evolving demand, enhance customer experience and satisfaction, and improve operational effectiveness and agility.

Real-time tracking and predictive delivery features now play a central role in building customer trust, offering convenience, and reducing customer support touchpoints by providing end-to-end visibility. However, implementing such digital solutions isn't without challenges. Internally, high upfront costs, system integration, poor data quality, and employee resistance can hinder progress; externally, vendor reliability, compliance issues, and supply chain volatility are key concerns. To overcome these, businesses are finding success through phased rollouts, user-centric change management, robust training, early user involvement, and measurable performance tracking. Ultimately, strategic digital transformation is not just about enhancing fulfillment speed and accuracy. it's also reshaping customer experience and brand loyalty in today's omni-channel retail landscape.

4.3 Descriptive Analysis (Source: Consumer Survey)

4.3.1 Research Question One- How do changing customer expectations for delivery speed and personalisation affect the use of automation technologies in omni-channel fulfilment systems?

4.3.1.1 Data Analysis

58 consumers participated in the survey

- Fast Delivery is a high priority
 - 81% of respondents rated delivery importance as 4 or 5
 - 31% - Scale 4
 - 50% - Scale 5
 - A small portion of consumers see fast delivery as unimportant. Only 12% rated it 1-2.
- Personalization satisfaction is moderate
 - Only 26% are very satisfied as they rated it 5
 - 31% rated it 3 (neutral) and 14% rated it 2 (somewhat dissatisfied)
 - Combined, 55% of respondents fall into the neutral or dissatisfied spectrum
- Majority noticed improvement in delivery speed
 - 84% said "Yes" to noticing faster deliveries in the past year.
 - Highest positive response came from the age group of 30–49 working professionals (95%) and 50+ males (92%)
- Fast delivery strongly influences buying decisions
 - 91% of respondents said faster delivery influences brand/platform choice
 - Especially high in-
 - Female age group (18-29): 93%
 - Working professionals with the age group (30-49) – 95%
 - Males (age group 18-49) are nearly 100%

4.3.1.1.1 On a scale of 1–5, how important is fast delivery in your online shopping experience?

(1 is Not important, 5 is Extremely important)

Gender	Occupation	Age group	Scale					Total
			1	2	3	4	5	
Female	Student	18 -29		1	1	7	5	14
	Working Professionals	30 - 49					1	1
	Entrepreneur	30 - 49					1	1
	Student	18 -29				2	2	4
Male		18 -29					1	1
	Working Professionals	30 - 49		3	3	5	11	22
		50+	2	1		1	8	12
		30 - 49				2		2
	Entrepreneur							
		50+				1		1
Total			2	5	4	18	29	58
%			3%	9%	7%	31%	50%	

Table –1

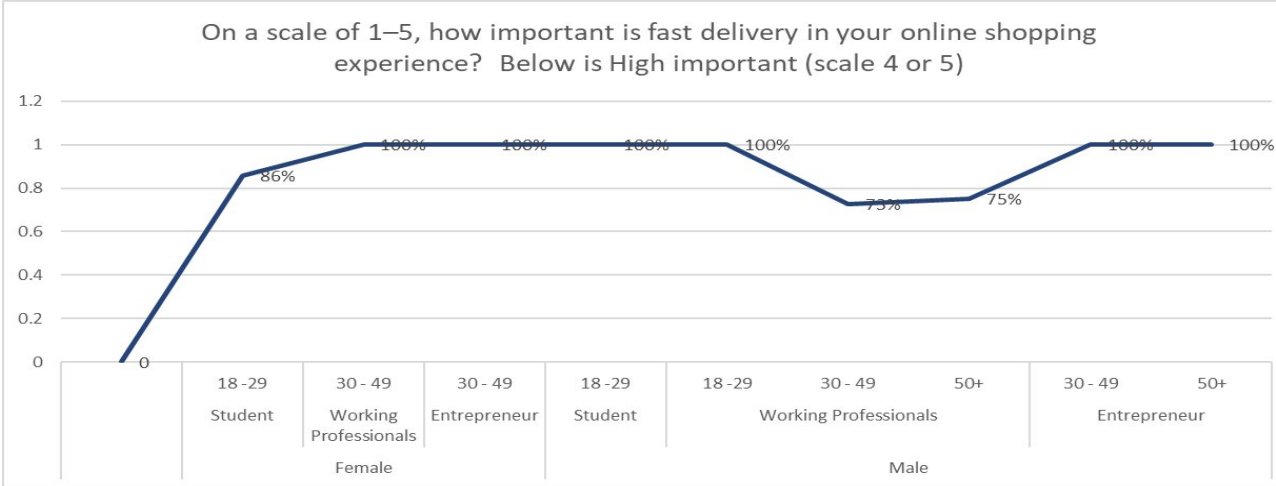


Figure – 1

4.3.1.1.2 On a scale of 1–5, how satisfied are you with personalization? (1 is Very dissatisfied, and 5 is Very satisfied)

Gender	Occupation	Age group	Scale					Total
			1	2	3	4	5	
Female	Student	18 -29		2	10	1	1	14
	Working Professionals	30 - 49			1			1
	Entrepreneur	30 - 49			1			1
	Student	18 -29			2	1	1	4
Male		18 -29					1	1
	Working Professionals	30 - 49	1	3	1	8	9	22
		50+		3	2	4	3	12
		30 - 49			1	1		2
	Entrepreneur							
		50+				1		1
Total			1	8	18	16	15	58
%			2%	14%	31%	28%	26%	

Table – 2

4.3.1.1.3 Have you noticed improvements in delivery speed over the last year?

Gender	Occupation	Age group	No	Yes	%Yes
Female	Student	18 -29	3	11	79%
	Working Professionals	30 - 49	1		0%
	Entrepreneur	30 - 49	1		0%
Male	Student	18 -29	1	3	75%
		18 -29		1	100%
	Working Professionals	30 - 49	1	21	95%
		50+	1	11	92%
	Entrepreneur	30 - 49		2	100%
		50+	1		0%
Total			9	49	84%

Table – 3

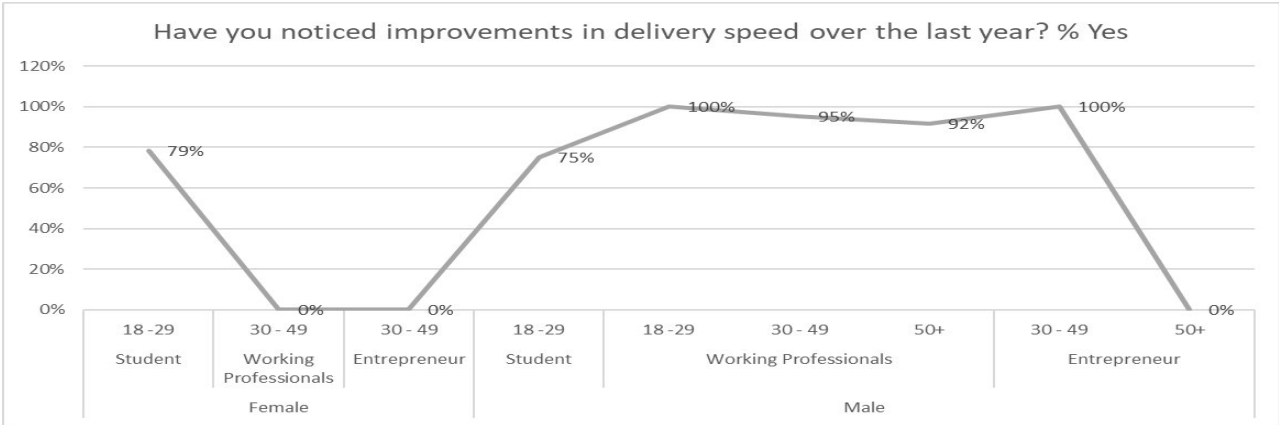


Figure- 2

4.3.1.1.4 Does faster delivery influence your decision to buy from a specific brand or platform?

Gender	Occupation	Age group	No	Yes	%Yes
Female	Student	18 -29	1	13	93%
	Working Professionals	30 - 49		1	100%
	Entrepreneur	30 - 49		1	100%
Male	Student	18 -29		4	100%
	Working Professionals	18 -29		1	100%
		30 - 49	1	21	95%
		50+	1	11	92%
	Entrepreneur	30 - 49	1	1	50%
		50+	1		0%
Total			5	53	91%

Table- 4

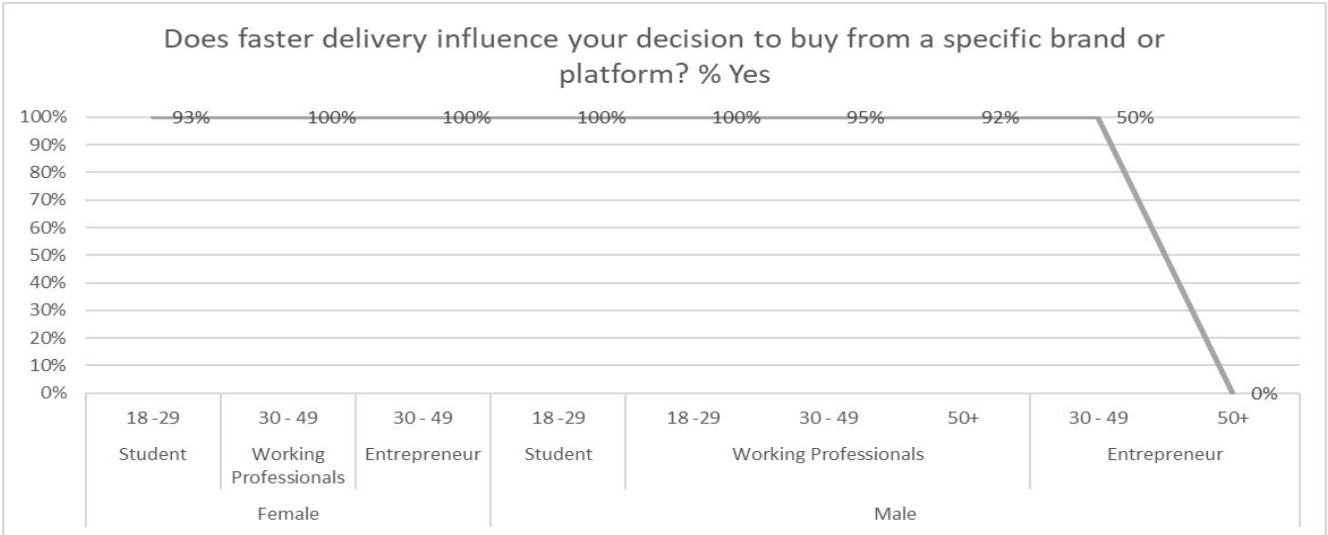


Figure- 3

4.3.1.2 Interpretation

The survey results reveal that consumers overwhelmingly prioritize fast delivery (scale 4 or 5), with 81% rating it as highly important. Working professionals and younger demographics (age 30-49) prefer fast delivery strongly, supporting the idea that speed is no longer a value-add but an expectation. Moreover, 91% of consumers stated that faster delivery directly influences their choice of brand or platform, which indicates that logistics speed is now a key factor in consumer loyalty and conversion.

While a large majority (84%) have noticed enhancements in delivery speed- particularly among older males and working professionals, this suggests that recent investments in automation technologies like sortation systems, real-time inventory synchronization, and optimized routing are not only effective but also recognized by end-users. These trends authenticate that the ongoing digital transformation in logistics is generating tangible benefits that enhance customer satisfaction.

However, satisfaction with personalization in the shopping experience remains moderate. Only 26% of respondents feel very satisfied, while 55% fall into the neutral or dissatisfied range, indicating a gap between customer expectations and personalization efforts. Consumers progressively desire tailored experiences- including customized references, adaptive delivery preferences, and targeted promotions. To address this, retailers must integrate AI-driven personalization engines into their omnichannel platforms to remain competitive.

These insights make it clear, collectively, that consumers expect fulfillment systems to be fast, intelligent, and personalized. Retailers who do not invest in automated fulfillment technologies, such as robotic picking, predictive shipping, AI personalization, and last-mile optimization, risk falling behind. Therefore, automation technology is key to success in omni-channel logistics, and this is no longer optional, but evolving consumer behavior and expectations have made this an essential strategy.

4.3.1.3 Overall Insights

Implementing automation technology in Omnichannel fulfillment is vital to meet consumer expectations for fast delivery. While personalization is appreciated, there is room for improvement in pushing Retailers for further investment in machine learning and data integration. In urban areas, automation technology in omni-channel fulfillment has had a good impact as most consumers of working demographics are recognizing development. Investing in smart warehousing led to Delivery speed, predictive analytics, and real-time inventory tracking. This influences strong buying decisions.

4.3.1.4 Conclusion

- Consumer expectations around fast delivery and personalization are not only increasing, but they are shaping competitive dynamics in retail.
- Automation is no longer optional; it's a strategic enabler of consumer satisfaction, loyalty, and long-term competitiveness.

4.3.2 Research Question 2 - How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?

4.3.2.1 Data Analysis

Data Analysis based on 58 consumers who participated in the survey.

- Strong Consumer Preference for Real-Time delivery tracking.
 - 93% of surveyed consumers prefer retailers that offer real-time delivery tracking.
 - All female respondents expressed a 100% preference for real-time tracking, across age and occupation groups
 - Among male respondents
 - 100% older age groups (50+) and professionals prefer real-time delivery tracking.
 - Slightly lower preferences were observed among younger male students (75%) and working professionals aged 30–49 (86%).

- Consumer satisfaction with tracking system accuracy is moderate to high.
 - 67% of consumers rated their satisfaction with tracking accuracy as high (scale 4 or 5).
 - 34% rated it 4, while 33% rated it 5.
 - Only 10% rated their satisfaction as 1 or 2 (low)
 - Satisfaction appears highest among-
 - Male working professionals in the age group of 30–49
 - Older male consumers aged 50+
 - Female students displayed mixed ratings, representing room for improvement in perceived accuracy.
- Real-time tracking influences repeat purchase behavior
 - 72% of respondents said that tracking information affects their ability to reorder from the same retailer.
 - Among female consumers, 93% of students showed that tracking impacts their repeat purchase choices.
 - Among male consumers-
 - Only 25% of male students said tracking impacts their reordering, a substantial deviation from other groups
 - 64% of male professionals in the age group of 30–49, and 75% of those aged 50+, said it affects their loyalty
 - 100% of male entrepreneurs and professionals aged 18–29 agreed on tracking the effects of repeat orders.
- Predictive delivery updates are highly appreciated.
 - 79% of consumers rated predictive delivery updates, e.g., Arriving tomorrow before 4 PM, as very or extremely useful (scale 4 or 5)
 - 24% rated usefulness as 4 (very useful)
 - 55% rated it as 5 (extremely useful)
 - This was consistent across almost all age and gender groups-
 - Male working professionals (age 30–49) and female students were the most enthusiastic about these features.
 - Older users (age 50+) even rated them positively, indicating widespread appeal.
 - 8% of users only rated predictive updates as not useful (scale 1 or 2).

4.3.2.1.1 Do you prefer retailers that offer real-time delivery tracking?

Gender	Occupation	Age group	No	Yes	%Yes
Female	Student	18 -29		14	100%
	Working Professionals	30 - 49		1	100%
	Entrepreneur	30 - 49		1	100%
Male	Student	18 -29	1	3	75%
	Working Professionals	18 -29		1	100%
		30 - 49	3	19	86%
		50+		12	100%
	Entrepreneur	30 - 49		2	100%
		50+		1	100%
Total			4	54	93%

Table – 5

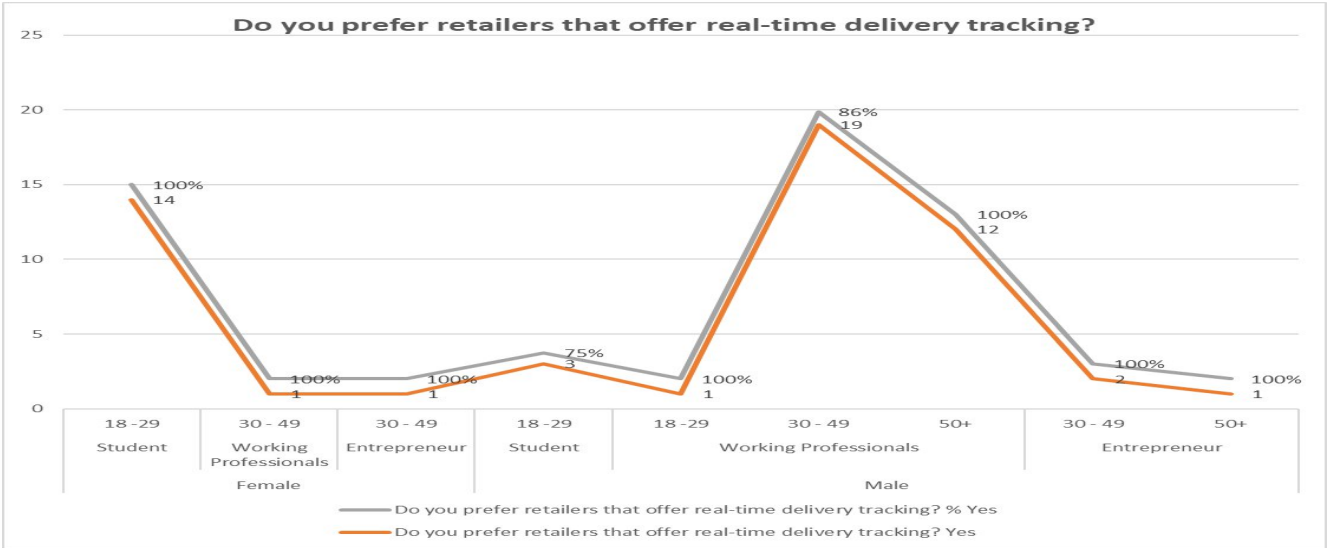


Figure -4

4.3.2.1.2 On a scale of 1 to 5, how satisfied are you with the accuracy of tracking systems? (1 is Not satisfied, and 5 is Very satisfied)

Gender	Occupation	Age group	Scale					Total
			1	2	3	4	5	
Female	Student	18 -29		2	6	4	2	14
	Working Professionals	30 - 49				1		1
	Entrepreneur	30 - 49		1				1
Male	Student	18 -29		1	3			4
	Working Professionals	18 -29					1	1
		30 - 49			2	8	12	22
		50+	2		1	6	3	12
	Entrepreneur	30 - 49				1	1	2
		50+			1			1
	Total			2	4	13	20	19
%			3%	7%	22%	34%	33%	

Table- 6

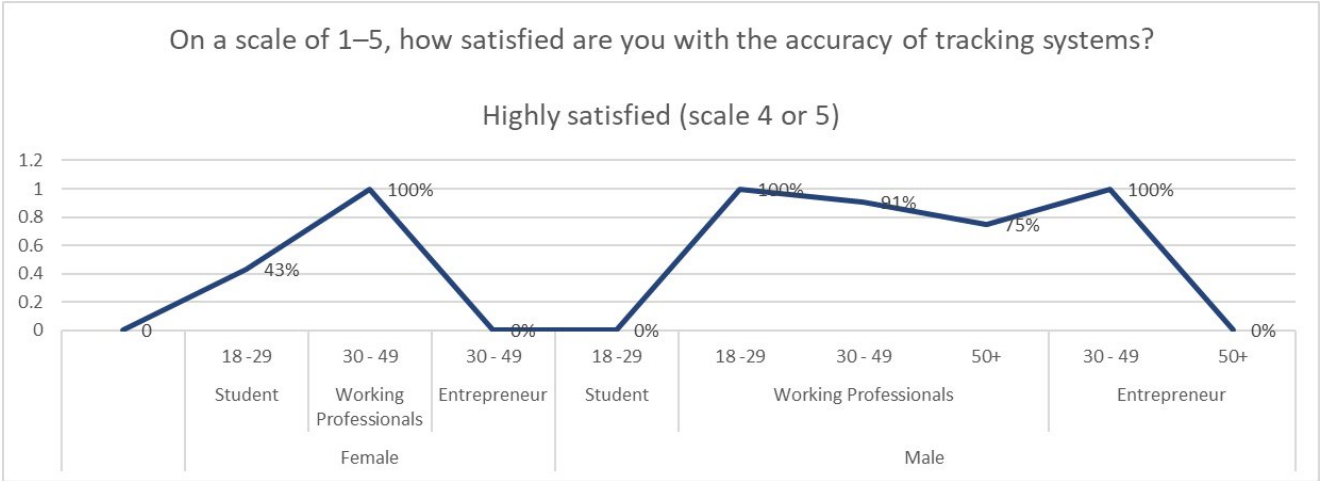


Figure- 5

4.3.2.1.3 Does tracking information affect your likelihood to order again from the same retailer?

Gender	Occupation	Age group	No	Yes	%Yes
Female	Student	18 -29	1	13	93%
	Working Professionals	30 - 49	1		0%
	Entrepreneur	30 - 49		1	100%
Male	Student	18 -29	3	1	25%
	Working Professionals	18 -29		1	100%
		30 - 49	8	14	64%
		50+	3	9	75%
	Entrepreneur	30 - 49		2	100%
		50+		1	100%
Total			16	42	72%

Table - 7

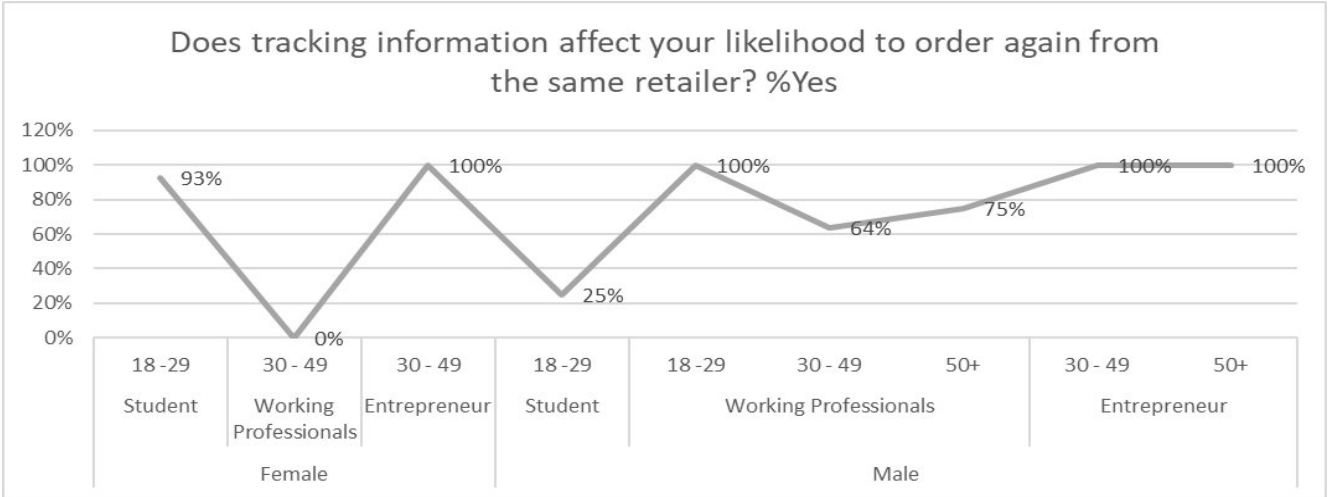


Figure- 6

4.3.2.1.4 On a scale of 1–5, how useful do you find predictive delivery updates (e.g., “Delivered by tomorrow before 4 PM”)? (1 = Not useful, 5 = Extremely useful)

Gender	Occupation	Age group	Scale					Total
			1	2	3	4	5	
Female	Student	18 -29	1	1	3	1	8	14
	Working Professionals	30 - 49					1	1
	Entrepreneur	30 - 49				1		1
Male	Student	18 -29			1		3	4
	Working Professionals	18 -29					1	1
		30 - 49		1	1	9	11	22
		50+	1	1	2	2	6	12
	Entrepreneur	30 - 49					2	2
		50+				1		1
Total			2	3	7	14	32	58
%			3%	5%	12%	24%	55%	

Table – 8

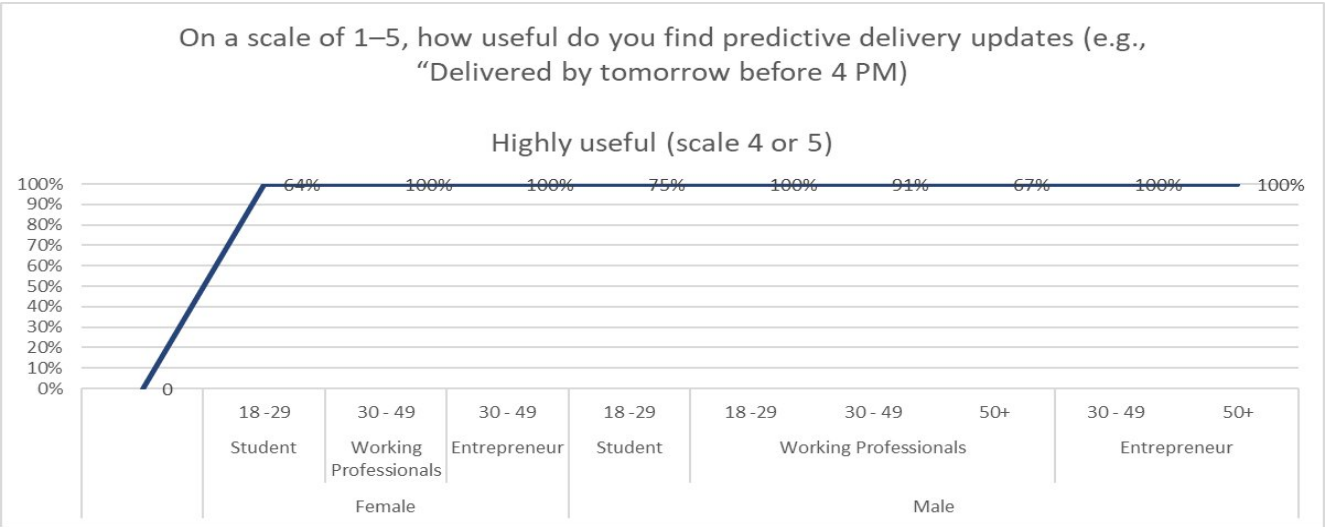


Figure- 7

4.3.2.2 Interpretations

As per 58 consumers who responded to the survey, real-time tracking has become a common expectation among consumers who associate it with reliability and transparency, especially female shoppers and older age groups. The majority of respondents, across the demography, highlight that its critical role in building trust, and they prefer retailers who offer such features. However, there is a slightly lower preference among younger male students, which may reflect their larger tolerance for uncertainty or lower order volumes. Notably, tracking accuracy influence for repat buying behavior, along with improving satisfaction, is especially among older and professional consumers, signifying that real-time tracking function is a key to drive loyalty. Furthermore, predictive delivery updates, such as ETA’s (expected time of arrival), are extremely valued across all user segments. These features allow consumers to plan better and feel more in control of their purchases. Retailers investing in AI-powered logistics tools, including real-time tracking and predictive delivery alerts, are likely to see stronger consumer satisfaction and retention in a progressively competitive omni-channel landscape. Top of Form

4.3.2.3 Combined Insights

Real-time tracking and predictive delivery are not optional anymore but key to meeting consumer expectations. Though satisfaction with existing systems is moderate to high, there is a noteworthy area of improvement to enhance accuracy and precision. These tools significantly influence the buying behavior of consumers and can lead to improved repeat sales and win customer loyalty. Retailers targeting young male students are required to implement additional strategies, such as discounts and gamification, to drive loyalty in this segment. The tracking tools alone are not sufficient.

4.3.2.4 Conclusion

Predictive delivery tools and real-time tracking are essential to consumer satisfaction in omni-channel retail. As digital transformation accelerates, it is observed that these tools are helping retailers reduce uncertainty, build trust, and increase repeat purchases. Also, the businesses that integrate these capabilities into their fulfillment ecosystems are likely to gain a competitive advantage in customer retention and overall satisfaction, as found.

4.3.3 Research Question Three- What are the barriers to adoption of digital and automated fulfillment systems, and how can these barriers be mitigated through strategic digital transformation in omni-channel logistics?

4.3.3.1 Data Analysis

- Out of 58 consumers participated in the survey
- Comfort level with automated services

- Overall trends:
 - 71% of respondents rate their comfort level at higher (scale 3, 4 or 5), showing a moderate-to-high acceptance of automated services like delivery alerts, smart lockers, and chatbots.
 - Most common rating is 4 (28%), followed by 5 (people 22%) and 3 (people 21%).
 - 29% (1 or 2 rating) respondents are still uncomfortable or doubtful about automation.
- Demographic findings:
 - Female students (age 18-29) show relatively low comfort levels. 10 out of 14 people rated between 1 and 3.
 - The most comfortable are the male working professionals, aged 30-49, as 21 out of 22 rated between 3 and 5.
 - With some hesitation, older age groups (50+) show more mixed responses.
- Key barriers to the adoption of automated systems
 - Top concerns:
 - 29% technical glitches or errors are the most cited concern as users worry about the system failure.
 - Many users feel automation is too impersonal, as indicated by 28% respondents who rated it as a lack of human interaction.
 - Privacy and security concerns (rated 22%) are significant, especially among female and younger users.
 - Usability may not be the main issue, as only 9% people found the systems difficult to use.
 - 12% of users reported no concerns, signifying a small group is fully comfortable.
 - Demographic highlights:
 - Female students aged 18-29 were especially sensitive to a lack of human interaction and privacy concerns.
 - Most male working professionals, aged 30–49, reported technical glitches as their top issue.
 - Though older males (50+) are more balanced, they showed concern about errors and human disconnect.
- What will make users more comfortable with automation?
 - Most desired improvements:
 - The top request is the human support backup, 47%, i.e., nearly half the users want a human safety net alongside an automated system.
 - Easier-to-use interfaces, 28%, are also vital to help with smoother design and intuitive workflows.
 - Trust among skeptical users will be boosted by privacy guarantees (17%)
 - Clear tutorials or guides (7%) are less demanded, probably because most users are fairly tech-savvy.
 - Though it's not a widespread sentiment, only 2% said automation is too mechanical and not ready.
 - Demographic observations:
 - Female students ranked human support and privacy.
 - Male professionals aged 30–49 highlighted both human fallback and interface design.
 - Older users (50+) are more supportive of human assistance than digital solutions.

4.3.3.1.1 On a scale of 1 to 5, how comfortable are you using automated services such as chatbots, smart lockers, or delivery alerts? (1 is Not comfortable, and 5 is Very comfortable)

Gender	Occupation	Age group	Scale					Total
			1	2	3	4	5	
Female	Student	18 -29	2	7	3	1	1	14
	Working Professionals	30 - 49				1		1
	Entrepreneur	30 - 49					1	1
Male	Student	18 -29			2	2		4
	Working Professionals	18 -29					1	1
		30 - 49	1		6	8	7	22
		50+	3	3	1	3	2	12
	Entrepreneur	30 - 49		1			1	2
		50+				1		1
	Total			6	11	12	16	13
%			10%	19%	21%	28%	22%	

Table- 9

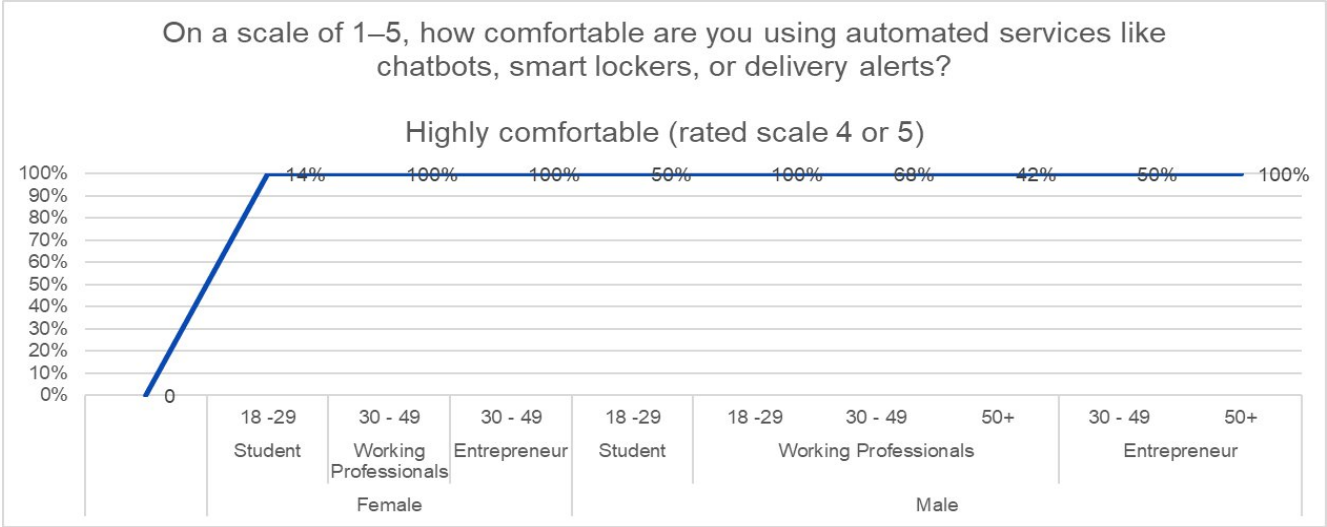


Figure – 8

4.3.3.1.2 What could be your main concerns with automated fulfillment systems? (Select all that apply)

Gender	Occupation	Age group	Difficult to use	Errors or technical glitches	Lack of human interaction	None	Privacy/security concerns	Total
Female	Student	18 -29		4	4		6	14
	Working Professionals	30 -49					1	1
	Entrepreneur	30 -49			1			1
Male	Student	18 -29			1		3	4
	Working Professionals	18 -29				1		1
		30 -49	2	9	5	4	2	22
		50+	2	4	3	2	1	12
	Entrepreneur	30 -49	1		1			2
		50+			1			1
Total			5	17	16	7	13	58
%			9%	29%	28%	12%	22%	

Table- 10

4.3.3.1.3 What would make you feel more comfortable using automation? (Select all that apply)

Gender	Occupation	Age group	Clear explanation/ tutorials	Easier-to-use interfaces	Human support backup	Not yet evolved. Its too mechanical	Privacy guarantees	Total
Female	Student	18 -29		2	9		3	14
	Working Professionals	30 -49		1				1
	Entrepreneur	30 -49			1			1
Male	Student	18 -29		1			3	4
	Working Professionals	18 -29					1	1
		30 -49	2	9	9		2	22
		50+	2	3	5	1	1	12
	Entrepreneur	30 -49			2			2
		50+			1			1
Total			4	16	27	1	10	58
%			7%	28%	47%	2%	17%	

Table -11

4.3.3.2 Interpretation.

- Majority of users are moderately comfortable with automation, but a substantial minority still distrusts or dislikes it, primarily due to privacy risks, impersonality, and technical failures.
- Human support is important as a backup. Customers want automation but not at the expense of service quality, as they think the human role is important.
- Serviceability and trust are reported as critical factors. As reported, the systems must be secure, intuitive, and reliable to win wider adoption.
- It is observed that user of different segments has different concerns. Hence, an approach of one-size-fits-all will not work.

4.3.3.3 Strategic recommendations to mitigate barriers.

- Hybrid automation- combine automation, especially during problem resolution, with human support channels.
- User-centric interface design- Investing in cleaner, simpler UIs to make users tech-friendly.
- Transparency in privacy practices- Include privacy certifications. customer data management to communicate clearly.
- Downtime and errors can be minimized by having a troubleshooting management system in place, like robust testing and predictive maintenance.
- Target to Education & Support by focusing on user control and privacy for younger users. For working professionals, reliability, speed, and seamless support are emphasized. Older-aged users should be offered tutorials, training materials, and onboarding assistance.

4.3.4 Summary of Quantitative Analysis (Source: Consumers Survey)

The consumer survey (n=58) supports all three research objectives. 81% of respondents rated fast delivery as highly important, and 91% said it influences brand/platform choice—confirming that rising expectations are pushing the adoption of automation in omni-channel fulfilment. However, only 26% were fully satisfied with personalisation, showing a gap that calls for AI-driven solutions.

93% prefer real-time tracking, and 72% said it influences repeat purchases. Predictive delivery updates were rated useful by 79%, indicating that such tools improve satisfaction, trust, and loyalty.

while 71% are generally comfortable with automation, key concerns include system errors (29%), lack of human touch (28%), and privacy (22%). Consumers want hybrid systems with human support (47%) and better UI (28%). Strategic digital transformation that combines tech with human-centric design is essential to overcome these barriers and drive wider adoption.

4.4 Descriptive Analysis (Source: Business Surveys)

4.4.1 Research Question One- How do changing customer expectations for delivery speed and personalisation affect the use of automation technologies in omni-channel fulfilment systems?

4.4.1.1 Data Analysis

60 businesses participated in the survey

1. Extensive automation implementation in response to consumer demands
 - 98% of businesses (surveyed) have adopted automation technologies in response to evolving customer expectations.
 - 100% of companies in retail, e-commerce, and technology in India have implemented automation.
 - 94% of organized logistics and supply chain businesses in India reported implementing automation.
 - All companies (surveyed) in the hospitality and logistics sectors also reported full adoption in the Middle East.
 - These figures show that automation is now viewed as a strategic requirement, not just a technological upgrade.
2. Faster delivery speed is the main driver of automation.
 - 83% of respondents rated faster delivery speed as a key motivation for adopting automation (alone or combined).
 - 81% of people rated fast delivery as important or extremely important.
 - Businesses are investing in:
 - Automation in fulfilment systems
 - Real-time order tracking and delivery updates
 - AI-driven last-mile logistics
 - The shift highlights that speed is now a key factor in retaining and attracting customers. This has become basic for businesses to survive.
3. Cost savings and personalization are now important secondary drivers.
 - 68% of businesses reported automation as a key to cost reduction benefit
 - Automation is used to reduce labor dependency, lower operational expenses, and minimize human error.
 - 43% of businesses, mostly in retail and e-commerce, cited improved personalization as a driver.
 - Investments are going into-
 - Customer behavior analytics
 - Targeted marketing automation
 - Recommendation engines
 - Though speed remains the top priority, companies identify that personalization enhances loyalty and conversation.
4. Strong influence of consumer expectations on automation strategy.
 - 82% of companies rated (scale 4 or 5) the influence of customer expectations as strong or extremely strong.
 - 45% rated it for extremely high influence on a scale of 5
 - 37% rated it for strong influence as scale 4
 - This confirms that automation choices are no longer driven exclusively by internal efficiency goals.
 - As customers are also showing interest in knowing about the kinds of automation implemented by the businesses, businesses are aligning automation strategies directly with external market pressure from demanding consumers.
 - eCommerce and Retail companies reported the highest influence, followed closely by logistics service providers. These industries have become largely.
5. Consumer expectations strongly influence the automation strategy.
 - Indian businesses, especially in retail, e-commerce, and logistics, are driven by a mix of-
 - Faster delivery
 - Enhanced personalization
 - Cost control and reduction

- This reflects India’s diverse, competitive, and large consumer market.
- Middle Eastern companies are (especially in logistics and hospitality) focusing more on-
 - Process transparency
 - Service visibility
 - Competitive pressure
- Though consumer expectations are universal, these differences suggest that the strategic focus varies by market maturity and competition.

6. Automation as a Strategic Investment in Omni-Channel fulfillment

- Businesses are integrating automation into their omni-channel fulfillment ecosystems, not treating it as a siloed system, as the success of omni-channel depends on automation and digital initiatives.
- Automation supports-
 - Faster multi-channel order fulfilment.
 - Seamless backed logistics. The tech-based logistics organization has evolved.
 - Integrated inventory visibility
 - Real-time customer service (Chatbots, updates, tracking)
- This ensures that consumers receive a fast, consistent, and personalized experience across all channels, in-store, online, and mobile.

4.4.1.1.1 Has your company adopted automation technologies in response to changing consumer demands?

Country group	Industry Type	No	Yes	Total	% Yes
India	Logistics / Supply Chain	1	16	17	94%
	Retail / E-commerce		32	32	100%
	Technology		1	1	100%
Middle East	Hospitality		1	1	100%
	Logistics / Supply Chain		9	9	100%
Grand Total		1	59	60	98%

Table- 12

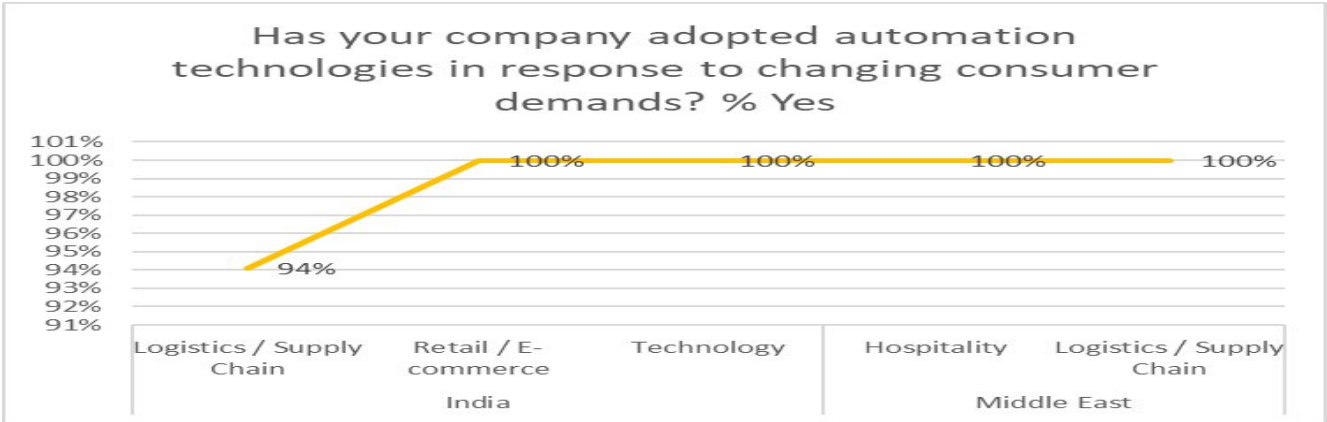


Figure- 9

4.4.1.1.2 If yes, what were the main drivers behind adopting automation? (Select all that apply)

Survey response	India			India Total	Middle East		Middle East Total	Grand Total
	Logistics / Supply Chain	Retail / eCommerce	Technology		Hospitality	Logistics / Supply Chain		
Cost reduction	2			2				2
Enhanced personalization						1	1	1
Enhanced personalization, Competitive pressure		1		1				1
Faster delivery speed	6	7		13				13
Faster delivery speed, Cost reduction	3	8		11		1	1	12
Faster delivery speed, Cost reduction, Agility	1			1				1
Faster delivery speed, Cost reduction, Competitive pressure		1		1				1
Faster delivery speed, Cost reduction, Error free processing		1		1				1
Faster delivery speed, Cost reduction, Process excellence, loss reduction, Better monitoring		1		1				1
Faster delivery speed, Enhanced personalization	1	1	1	3		2	2	5
Faster delivery speed, Enhanced personalization, Competitive pressure		2		2				2
Faster delivery speed, Enhanced personalization, Cost reduction	1	3		4		2	2	6
Faster delivery speed, Enhanced personalization, Cost reduction, Competitive pressure	2	5		7	1	2	3	10
Faster delivery speed, Enhanced personalization, Cost reduction, Competitive pressure, More visibility on process and where we are		1		1				1
Process Improvements and Data Quality						1	1	1
Value add to customers	1			1				1
All of the above		1		1				1
Grand Total	17	32	1	50	1	9	10	60

Table- 13

4.4.1.1.3 On a scale of 1–5, how strongly have consumer expectations influenced your automation strategy? (1 = Not at all, 5 = Extremely high influence)

Country group	Industry Type	Scale					Total
		1	2	3	4	5	
India	Logistics / Supply Chain	1		4	4	8	17
	Retail / E-commerce			6	9	17	32
	Technology				1		1
Middle East	Hospitality					1	1
	Logistics / Supply Chain				8	1	9
Total		1	0	10	22	27	60
%		2%	0%	17%	37%	45%	100%

Table -14

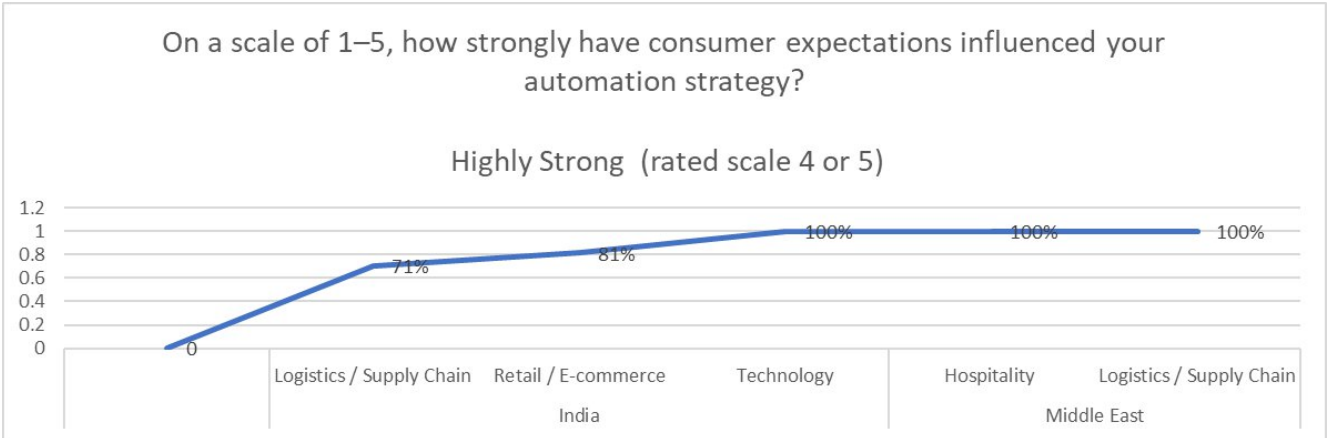


Figure- 10

4.4.1.2 Conclusion

- The survey confirms that consumer expectations, especially for speed and personalization, are the main forces driving automation in omni-channel fulfillment.
 - Businesses recognize automation as
 - A response to delivery expectations
 - A driver of loyalty through personalization
 - A tool for competitive advantage
- Companies not adapting to these changes risk falling behind in customer satisfaction, operational efficiency, and retention.

4.4.2 Research Question Two- How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?

4.4.2.1 Data Analysis

60 businesses participated in the survey

- Widespread implementation of predictive delivery tools and real-time tracking.
 - 95% of businesses (surveyed) have implemented real-time tracking or predictive delivery tools.
 - 97% of retail/e-commerce and 88% of logistics/supply chain firms in India have adopted such technologies.
 - In the Middle East, 100% of companies across the logistics and hospitality sectors have implemented these tools.
 - The technology sector in India, though the sample is small, shows 100% adoption.
- Having a significant positive impact on customer satisfaction.
 - Post Implementation-
 - 77% of businesses reported a significant improvement in customer satisfaction.
 - 23% saw a moderate improvement.
 - None reported no improvement.
 - Industry-wise
 - 100% of hospitality and technology firms saw significant improvement.
 - 75 -78% of logistics and retail companies reported significant gains.
- Key benefits – there are the following key benefits reported after adopting real-time tracking and predictive delivery, across 60 businesses
 - Increased repeat purchases as per 70% respondents.
 - The most frequently rated benefit.
 - This underscores how reliable delivery and transparency encourage repeat sales and brand loyalty.
 - Improved customer reviews - mentioned by 50% respondents.
 - There is better feedback and positive online reviews from customers because of good delivery experiences.
 - Retailers reported that enhancing customer sentiment is directly linked with proactive communication and visibility.
 - Reduced delivery delays - mentioned by 60% people.
 - It's reported that predictive tools help improve route optimization, exception handling, and delivery accuracy.
 - It is analyzed that real-time data helps pre-empt delays or communicate them better, and improves customer perception.
 - Fewer customer service inquiries – as mentioned by 35% businesses
 - The self-service tracking and accurate ETAs (expected time of arrival) reduce the burden on customer service teams when customer inquiries are less.

- When customer inquiries are fewer, this lowers support costs and improves operational efficiency.
- Operational benefits and accuracy improvement
 - A few respondents noted that there is better data quality, delivery accuracy, and process transparency.
 - These are secondary benefits that support backend performance by streamlining the operations.
- Cross-industry & cross-region trends
 - In India, retail/ eCommerce businesses reported a wide mix of benefits, often combining increased purchases, better reviews, and fewer inquiries. The logistics firms tended to reduce delays and focus on repeat sales, indicating a more operations-focused implementation.
 - In the Middle East, with smaller sample sizes, it's been found that businesses overwhelmingly experienced multiple benefits, with a strong emphasis on improved customer reviews and reduced delays. Uniformly high satisfaction and performance indicators.

4.4.2.1.1 Has your organization adopted real-time tracking or predictive delivery systems?

Country group	Industry Type	No	Yes	Total	%Yes
India	Logistics /Supply Chain	2	15	17	88%
	Retail /E-commerce	1	31	32	97%
	Technology		1	1	100%
Middle East	Hospitality		1	1	100%
	Logistics /Supply Chain		9	9	100%
Total		3	57	60	95%

Table- 15

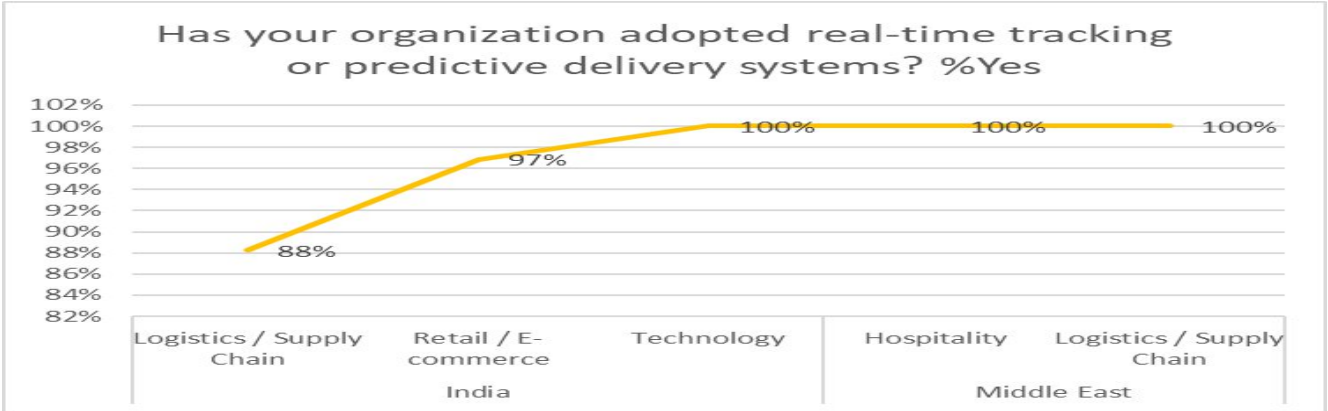


Figure- 11

4.4.2.1.2 After implementation, how would you rate the change in customer satisfaction?

Country group	Industry Type	Moderate improvement	Significant improvement	Total	%Significant improvement
India	Logistics /Supply Chain	4	13	17	76%
	Retail /E-commerce	8	24	32	75%
	Technology		1	1	100%
Middle East	Hospitality		1	1	100%
	Logistics /Supply Chain	2	7	9	78%
Total		14	46	60	77%

Table- 16

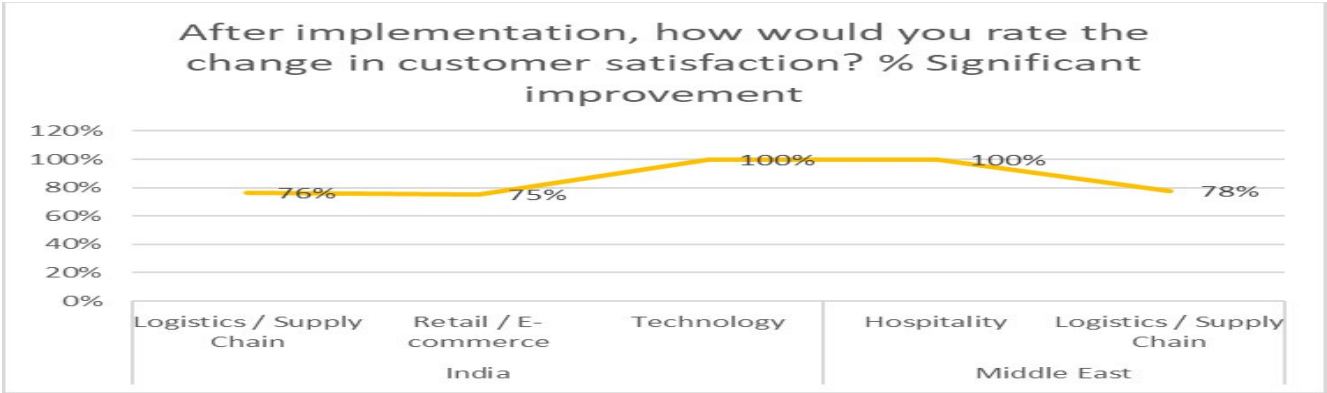


Figure- 12

4.4.2.1.3 What benefits have you observed since adopting these tools? (Select all that apply)

Survey response	India			India Total	Middle East		Middle-East Total	Grand Total
	Logistics / Supply Chain	Retail / eCommerce	Technology		Hospitality	Logistics / Supply Chain		
Fewer customer service inquiries		1		1				1
Fewer customer service inquiries, Improved customer reviews		1		1				1
Fewer customer service inquiries, Improved customer reviews, Reduced delivery delays	1	2		3				3
Fewer customer service inquiries, Reduced delivery delays	1	1		2		1	1	3
Improved customer reviews	2			2		2	2	4
Improved customer reviews, Reduced delivery delays		1		1		2	2	3
Increased repeat purchases	3	4		7		1	1	8
Increased repeat purchases, Fewer customer service inquiries		1		1				1
Increased repeat purchases, Fewer customer service inquiries, Improved customer reviews, Reduced delivery delays	3	7	1	11	1	1	2	13
Increased repeat purchases, Fewer customer service inquiries, Improved customer reviews, Reduced delivery delays,		1		1				1
Increased repeat purchases, Fewer customer service inquiries, Reduced delivery delays		1		1				1
Increased repeat purchases, Improved customer reviews	2			2				2
Increased repeat purchases, Improved customer reviews, Reduced delivery delays	1	6		7		1	1	8
Increased repeat purchases, Reduced delivery delays	2	4		6				6
Reduced delivery delays	1	1		2		1	1	3
Reduced delivery delays, Accuracy improvement	1			1				1
All of the above		1		1				1
Grand Total	17	32	1	50	1	9	10	60

Table- 17

4.4.2.2 Interpretation

The survey findings evidently show that real-time tracking and predictive delivery tools have become vital across industries, with 95% of businesses implementing them. This significant increase in the use of technology reflects how essential these technologies are for improving customer experience in omni-channel retail. There is a noteworthy impact on customer satisfaction. Hospitality and tech sector businesses reported a significant improvement (77%), where expectations for service quality are highest. Businesses cite the following Key benefits: reduced delivery delays, fewer service inquiries, better customer reviews, and repeat purchases. As per business respondents, the key takeaway from real-time tracking and predictive tools is that they don't just improve CX (customer experience) but also drive hard business outcomes like Loyalty, Brand reputation, and operational efficiency. Though retailers

achieve more reputation and loyalty, logistics and supply chain firms benefit from seamless processes and reduced delays. Overall, predictive tools and real-time tracking tools act as a bridge between digital transformation and tangible business outcomes, and measure ROI, making them a critical investment for both customer satisfaction and long-term business performance.

4.4.2.3 Combined insights

- Real-time tracking and predictive tools are nearly universal among businesses that are striving to meet the customer expectations of the modern era.
- These tools deliver measurable improvements in customer satisfaction, reducing service frictions, and influencing repeat sales.
- Business metrics are positively impacted precisely in omni-channel environments, such as customer sentiment, delivery accuracy, and inquiries.
- Achieving a tangible consumer experience is directly linked with the true power of these technologies, which lies in their ability to merge digital transformation.

4.4.2.4 Conclusion

Predictive delivery systems and real-time tracking have become essential mechanisms of e-commerce, omni-channel retail, and logistics operations, especially for fulfillment and last-mile delivery. Their adoption leads to improved delivery lead time, enhanced brand perception, improved consumer satisfaction, repeat purchasing behavior, and further efficient operations. Businesses that leverage these tools as part of their digital strategy are better positioned to sustain in the long term in meeting the rising expectations of today's tech-savvy consumers.

4.4.3 Research Question Three- What are the barriers to adoption of digital and automated fulfillment systems, and how can these barriers be mitigated through strategic digital transformation in omni-channel logistics?

4.4.3.1 Data Analysis

- 60 people participated in the survey from businesses
 - 83% (respondents -50) are from India, and 10 responses (17%) are from the Middle East.
 - The Retail/eCommerce sector in India contributed the most responses, 32 out of 60
- Barriers to technology adoption
 - Top barriers:
 - Lack of awareness appears most frequently, in combination with other issues, such as low digital literacy or resistance to change.
 - Privacy and security concerns are also widely cited alongside other factors.
 - The issue of resistance to change is a recurring one, particularly when combined with a lack of awareness or poor digital literacy.
 - Cost concern appears as a less frequent concern compared to awareness and resistance.
 - Insights by industry & region.
 - Barriers are multi-faceted in India- rather than standalone issues, most entries are combinations of several concerns.
 - Responses are fewer but reflect similar themes in the Middle East, mainly security/privacy and digital literacy.
 - There are concerns of resistance, awareness, and security related to the Retail and Logistics sectors most frequently, which highlights the need for broader customer education.
- Strategies used for overcoming barriers
 - Key notes:
 - Most commonly adopted strategy is customer education/training, mostly in combination with campaigns of digital marketing awareness, assurance

of security and privacy, and offering hybrid systems, i.e., digital and manual.

- In 5 instances alone, Privacy/security assurances were used.
- Use of hybrid systems is gaining traction (where manual support complements automation) with 13 mentions across different combinations.

Key strategic theme-

- There are no standalone actions; rather, multifaceted strategies are more common. When businesses emphasize privacy messaging and system flexibility, they are also bundling customer training.
- Critical enablers are Trust and Digital literacy for customer adoption.
- Trust building and education are focused on by businesses as core pillars of adoption.

➤ Effectiveness of Strategies (rated on a scale of 1–5)

- Ratings summary-
 - 75% are positive responses. 43% people rated strategies as 4 (effective), 32% people rated them 5 (very effective).
 - 22% people gave a neutral rating of 3
 - Only 4% respondents (2 people) rated effectiveness as 1 or 2.
- Effectiveness by industry and region:
 - Retail and eCommerce (India) showed the highest satisfaction, with 24 out of 32 responses rating 4 or 5.
 - Logistics and Supply Chain (India) also saw strong effectiveness — 13 out of 17 responses rated 4 or 5.
 - Middle East respondents (Logistics & Hospitality) also rated the strategies positively, with no negative feedback, and 6 out of 10 reported 4 or 5.

4.4.3.2 Interpretations and key insights

- Top 5 Business Insights:
 - There is a lack of awareness, resistance to change, and concerns about security/privacy are the dominant barriers that were reported across sectors and regions
 - Education, awareness campaigns, and hybrid systems (a combination of system and manual) are the most common and effective responses.
 - Businesses are recognizing that instead of investing alone in technology, they must also invest in customer engagement, transparency, and transition support.
 - Observed the high effectiveness scores that adoption improves significantly when businesses combine multiple strategies,
 - A safe, familiar, and easy-to-use system is given more importance. Hence, the shift is toward trust-based digital transformation.

4.4.3.3 Recommendations for strategic digital transformation in Omni-channel fulfillment and logistics

- Customer-centric change management – Recommend implementing a training program and onboarding tailored to different user groups, and create tutorials, FAQs, and live demos step by step for digital tools.
- Build trust through transparency – This is recommended to share the privacy and data usage guidelines publicly, and provide security assurances like end-to-end encryption, verified systems, or third-party certifications.
- Hybrid Fulfillment Models- As per the survey report, recommend introducing a hybrid (combination of manual and digital) workflows, e.g., live support with automated lockers or order tracking. The organization must also allow users to choose gradually instead of forcing full upfront automation.
- Localized Digital Literacy Campaigns – Survey advised to implement education efforts by age group, region, and tech exposure level. This can be collaborated with local influencers or community leaders to influence grassroots tech education.
- Data-driven feedback loops – Feedback is very important for continuously monitoring user adoption, lost or drop-off rates, and analyzing the trends of

support tickets to refine digital systems. It is also recommended to incorporate the customer feedback into UI /UX and enhance the feature.

4.4.4 Summary of Quantitative Analysis (source: Business Surveys)

Out of 60 businesses surveyed, 98% have adopted automation to meet growing consumer demands for faster delivery (83%) and personalization (43%). Retail, e-commerce, and logistics sectors report full automation integration, confirming that automation is now strategic, not optional. Consumer expectations are a key driver for 82% of businesses, showing that fulfillment technology is evolving in response to external pressures.

95% of businesses use real-time tracking and predictive delivery tools, leading to 77% reporting significant customer satisfaction gains. Key benefits include repeat purchases (70%), better reviews (50%), and fewer inquiries (35%), proving that these tools enhance experience and efficiency. This meets the objective of linking digital tools to improved buying behavior and loyalty.

Barriers include low awareness, resistance to change, and privacy concerns. Businesses are overcoming these through customer education, hybrid models, and trust-building strategies, with 75% rating these approaches as effective. These findings meet the objective of outlining actionable paths to smooth digital transformation in omni-channel logistics.

4.5 Mixed-Method Analysis -Qualitative and Quantitative (Source: Case Studies)

4.5.1 Research Question One- How do changing customer expectations for delivery speed and personalization affect the use of automation technologies in omni-channel fulfillment systems?

4.5.1.1 Example of Reliance Retail Ltd.

What Consumers Want and How Automation Is Used: Reliance Retail is a process-oriented company that implements new things to be in the market as a leader. To meet the expectations of the Indian consumers for faster delivery times and more personalised shopping experiences, Reliance Retail is using automation technologies in its stores across. They are using AI to make recommendations and implement AR so people can try on clothes online; these two are examples of how personalization can improve the customer experience, which makes customers more engaged and satisfied. Reliance Retail's JioMart platform is a great example of using automation. To fulfil the customers' expectations for faster service and more personalised options, JioMart's has integrated the general trade business, i.e., local Kirana stores, through Jio's Point-of-Sale (PoS) system, which has made things run more smoothly. This initiative helps with real-time updates on inventory, speeds up order processing, and reduces the delivery turnaround time (TAT), which is exactly what customers want, i.e., speed and dependability.

Consumer Expectations: Data says that a big portion 70% of Indian shoppers, check the products online before buying them, in person, which shows the importance of making it a smooth and connected shopping experience. Reliance Retail has developed the Internet of Things (IoT) for managing smart inventory with real-time stock counts without holding the operations, and they have used AI and machine learning (ML) for personalised recommendations, augmented reality (AR) for virtual try-ons.

JioMart's Integration: Now JioMart has linked about 30 million Kirana stores to Reliance's omni-channel, i.e., Physical and digital infrastructure. This makes sure that orders are filled quickly and efficiently by using local inventory for walking customers, and TMS enables the best routes for online orders. This method directly meets customers' expectations for quick service and product availability.

Investments in Technology: Reliance Retail. Being the largest organization and leader in the retail industry in India, puts a lot of money into technology in three main areas for offline business solutions, plugins, and the technology that runs JioMart. This makes sure that customers have a smooth and unified experience.

Consumer Behavior: By connecting online and offline channels, Reliance Retail has made shopping more enjoyable, which is witnessed by more and more people shopping with them.

Quantitative data points:

Revenue Growth: Reliance Retail has achieved the revenue growth to ₹3.06 lakh crore for the financial year 2024, which is a 17.8% rise annually by digital transformation, i.e., this shows that the changes have had a good effect on the company's finances.

SME Engagement: The platform has helped local businesses tremendously and made the product selection more diversified as about 20% of JioMart's sales and orders come from 60,000 small and medium-sized businesses (SMEs).

Customer Satisfaction: NPS (Net Promoter Score) of online platforms like AJIO has improved by an 11-point rise seen in their NPS, which is made possible by features like faster delivery times and better customer service. Better NPS shows that customers are happier.

4.5.1.2 An example of Flipkart

Changing consumer expectations for delivery speed and personalization are a major factor in the rise of automation technologies in omni-channel fulfilment. Flipkart, a leading e-commerce company in India, uses more advanced automation to stay competitive and meet the customers' expectations, e.g., Flipkart's partnership with Green Line Mobility Solutions to deploy 25 LNG trucks is a big step for making deliveries more efficient and fulfilling customers' expectations for faster service that is growing.

Flipkart has increased the processing capacity by inducting Automated Guided Vehicles (AGVs) in its sorting center in Bengaluru, making it possible to handle 4,500 shipments per hour instead of 500. Additionally, Flipkart has put the tools of predicting delivery time, including various factors like the customer's place, sellers' inventory, and type of products, such as "promise engine," which uses machine learning algorithms. This predictive method makes the customers happier and more loyal by beating the customers' expectations, often in terms of delivery speed.

4.5.1.3 A case study of Swiggy India

Evolving consumer expectations for faster delivery and personalized service have led to automation and digital transformation in the omnichannel fulfillment system. Swiggy initiates this change through various technology-based strategies, being a major player in India's quick commerce industry.

Real-Time Delivery Optimisation: Swiggy has reduced the delivery TAT (turnaround time) from 42 minutes to 32 minutes in bigger cities like Bangalore and Delhi by using machine learning algorithms. **Hyperlocal Strategy and Personalisation:** Swiggy leverages the consumers' preference data and product buying habits for the restaurant and products at the micro market level to make the customers happier, in terms of test and like, by making service better in terms of efficient operations, providing local tests, and preferences. **AI-Powered Customer Support:** Using AI-powered chatbots has improved customer service by reducing the time it takes to solve problems and support available for 24X7. Such a digital initiative has increased 15% customer retention and built loyalty. This action of investment in automation technology has a direct link to changing consumer preferences, and this shows the importance of digital transformation in meeting higher service expectations.

Quantitative Measures:

Annual Revenue Growth: There is growth by 36% at Swiggy's as operating revenue surged from INR 8274 Crores in FY2023 to INR 11247 Crores in FY2024 (as per Entrackr, 2024). The Gross Order Value (GOV) for FY2024 was ₹35,000 crore, of which food delivery made up 70% and Instamart 23% (as per LiveMint, 2024). **Delivery Speed:** Instamart's average delivery time for groceries met the need for instant gratification by making the delivery in 10 minutes (Reuters, 2024). **Customer Retention and Engagement:** Swiggy's Net Promoter Score (NPS) of 43 indicates that users are very happy with the service level (Comparably, n.d.). As a result, there are about 14.3 million users who make transactions each month, with an average of 4.5 transactions made by each user (LiveMint, 2024; Inc42, 2024).

4.5.1.4 A case study at Amazon India and the Middle East

In India, Omni-channel fulfillment is using more automation technology because of the need for fast delivery and personalised experiences from customers. While Amazon replicates its best practices worldwide, they have implemented advanced automation tools in its operations in India and the Middle East, changing how it gets its goods. Amazon has started delivering the products within 4 to 6 hours in India and the Middle East, especially in the metro cities. Amazon implemented the automated sortation centers like sort sliders and auto sorters that have improved the sorting efficiency by 30%. AI-powered forecasting tools improve the delivery speed and make the service level more efficient. The tools work on past sales trends and weather conditions to figure out the best places to put inventory, hence high-demand items are kept near customers.

In the Middle East, Amazon has invested in cutting-edge delivery systems, AI, and big data analytics tools that help optimize the delivery routes and the manpower deployment management, making last-mile delivery more reliable and faster. They have implemented this in their Abu Dhabi delivery station that handles same-day and one-day deliveries. These efforts show a clear cause and effect relationship as customers want faster service and more options, and retailers like Amazon is using advanced automation technologies to stay competitive and meet the expectation of service level.

4.5.1.5 A Study of Talabat in the GCC

What Customers Want: Speed of Delivery and personalization are more expected by consumers. They want their orders to arrive faster and quicker, often within hours or even minutes. Also, more people want personalised experiences, where services and recommendations are made to fit their expectations.

Talabat has adopted technologies for automation, like offering drone delivery services in Oman, making it the first company in the region to do this for food delivery. The goal of this project is to deliver the orders to places that are hard for others to reach, which helps reduce the delivery times and meet customers' evolving expectations. The in-house company made Talab AI, such as a grocery shopping assistant powered by ChatGPT, which gives each customer a unique shopping experience in terms of personalization, as this is easier for customers to find recipes and order the ingredients they need, which makes things more convenient and personal.

Talabat has achieved better delivery TAT (Turnaround time) and personalized features by using automation technology, and made customers happier and loyal. They have also improved the operations efficiency with the support of automation, resulting in them being able to handle more volumes and execute them quickly for faster delivery, which is exactly what customers expect.

4.5.1.6 Example at noon.com in the GCC

The important factors in omni-channel fulfillment for the implementation of automation are fast deliveries and personalisation. Noon.com is one of the biggest e-commerce companies in the Middle East, and has changed the way we meet new needs. The company has different

services, like Noon Daily for quick grocery delivery and now for super-fast fulfilment, which can happen in just a few minutes, a result of evolving customers' expectations to get things easy and quick.

Noon.com has built a fulfillment center with a size of 252,000 SQM at strategic locations in Abu Dhabi with the adoption of cutting-edge automation technology for inventory storage, processing of orders, and a sortation system. They have also improved operational flexibility with the implementation of AI recommendations, cloud-based infrastructure, and Google Cloud tools like Kubernetes Engine and BigQuery. These technologies allow to make decisions on data to scale up in real time during peak time, giving customers personalized experiences.

As per a study of Arab News (2023), 91% people in MENA (Middle East and North Africa) shop online after pandemic of Covid-19, reflecting how much people are depending on e-commerce. The company should focus more on moving towards how customers act, and the adoption of automation technology is an answer to it. McKinsey & Company (2022) also said that businesses that used real-time tracking saw a 15% rise in customer satisfaction and a 10% rise in repeat purchases. As eMarketer (2023) found, 65% of people admitted they had a better feeling in buying when they could track their shipments. These numbers show the importance of automation technologies in meeting consumers' expectations for speed, visibility, and personalization.

4.5.2 Research Question Two- How do real-time tracking and predictive delivery tools (made possible by digital transformation) affect consumer satisfaction and buying behavior in omni-channel retail?

4.5.2.1 A case study on Reliance Retail Ltd

Digital transformation has been very helpful in making customers happier. To make this possible, retailers are using such tools for real-time tracking and predicting delivery. Such systems provide customers with accurate delivery dates and allow them to track their orders in real time, which builds trust and a culture of openness. Reliance Retail has made sure that orders are delivered on time, intact, and accurate, and it makes customers happier overall by using tech-enabled advanced logistics systems. The use of such effective tools of real-time tracking and predictive delivery has had a positive effect on customer expectations, for e.g., JioMart's has improved the delivery speed with more accuracy for more than 60,000 small and medium-sized businesses (SMEs). This has boosted the customers' trust in the brand and encourages them to repeat buying. In terms of customer satisfaction, research shows that a seamless omni-channel experience raises the buying value by 20–25%. As far as buying behavior is concerned, retailers have increased the transaction size by 15-35% and increased lifetime value by 30% in comparison to retailers using an omni-channel strategy vs not using one channel. Tracking in real time gives customers confidence in staying and repeat buying, as it makes things clear and predictable. Moreover, the ability to track orders with the prediction of arrival gives consumers a sense of control, resulting in them being more likely to buy more.

4.5.2.2 Examples of Flipkart

Flipkart, being one of the largest e-commerce companies in India, is an example of creating a unique shopping experience for each customer by digital transformation, i.e., Flipkart's Commerce Cloud solution for dynamic pricing and competitive intelligence. The digital transformation at Flipkart, such as real-time tracking and predictive delivery tools, is very important for making customers happier and changing their buying habits. As a result, Flipkart has achieved 10% higher sales because of faster delivery and setting up competitive prices. Flipkart is also using augmented reality (AR) features like Flipkart camera to help customers see what products look like in their own homes before they buy them. This reduces the return % and improves customers' shopping experience, overall. Moreover, Flipkart's "promise engine," which gives accurate delivery time estimation and real-time tracking, benefits customers with more control over their purchases. Such improvement in digital transformation

and automation has resulted in building trust, transparency, and repeat purchase because of streamlining the delivery process in terms of lead time, accuracy, and visibility.

4.5.2.3 Swiggy India at a look

Swiggy has initiated the digital transformation for real-time tracking and predictive analytics that improves customer experience and has a positive effect on customers' buying things across all the channels. They have smartly used the tools to build trust and engagement. Customers use the tools and can see the status of their orders in real time. This makes the whole process pleasant with clearer, and lowers stress about delivery times. Swiggy has also adopted a predictive delivery system that uses analytics to support customers in getting information about accurate delivery windows. This dependability builds customer trust and makes them more likely to buy again, as customers can plan and avoid delays. Swiggy has also implemented dynamic pricing and personalization tools by which Swiggy uses customer data to offer them discounts and personalized deals. This encourages customers to buy and raises the order value by engaging them uniquely. Such digital initiatives help improve behaviors, including customer satisfaction, loyalty, and buy frequency.

4.5.2.4 A case study of Amazon India and the Middle East

Digital transformation, such as real-time tracking and predictive delivery tools, has a big positive impact on customer satisfaction and repeat purchase in omni-channel. A survey conducted in 2023 found that 63% of online shoppers expect to track their orders by themselves, and 96% are happy with an ecommerce provider by seeing their delivery affects. Amazon meets the customer expectations by introducing GPS tracking and real-time delivery updates to its logistics operations. In India, such visibility eases delivery-related stress and lowers the no of customers from leaving their carts, reflecting that they are more satisfied and confident in their purchase journey.

Amazon also offers same-day and next-day delivery options to customers in the Middle East based on real-time data, as per customer demand and traffic patterns. This is done with the help of AI-based predictive delivery system, where customers can choose the one that works as per their convenience, which not only makes things easier and builds brand loyalty, but also this flexibility based on region has been directly linked to happier customers and higher conversion rates. Eventually, digital transformation and technology have changed the customers' expectations, delivery transparency, and key factors in satisfaction and repeat purchase in omni-channel systems.

4.5.2.5 An example of Talabat in the GCC

Talabat digital initiatives have directly linked tools and results for customers tracking in real time of their orders, benefiting consumers with transparency and convenience. Customers can see the status of orders in real time, which lowers uncertainty and builds trust in the service. By the real-time tracking facility, customers can better plan their time, which is a matter of making them happier. Talabat tools for predictive delivery benefit customers with accuracy and reliability. Their predictive tools give consumers an idea of the arrival status of their package, i.e., help them keep their expectations in check. Customers also trust and are happy with the service of accurate predictions on the arrival of the orders. Talabat has integrated AI to find the best routes, and knows the ETA (expected time of arrival) of the shipment to make sure that orders are delivered on time and customer experience is enhanced. Also, the company uses AI for personalization and discount offers, which makes shopping more enjoyable and encourages customers to repeat buying.

These initiatives of real-time tracking and delivery predictive tools have positive effects on frequent purchases and high conversion rates.

4.5.2.6 A case study of noon.com in the GCC

Qualitative Insights- noon.com believes that real-time tracking and predictive delivery tools are two of the most important parts of digital transformation in omni-channel fulfillment to meet customers' expectations. They find out past purchase trends and customers' preferences by using the AI-driven analytics tools that recommend personalized products, making the new shopping experience unique to each customer. These tools give customers more control over the delivery process, along with making things more personalized. With visibility of the order status, the delivery-related anxiety reduces, and this builds trust in customers. This boosts satisfaction and brand loyalty in customers as they rate Noon.com a more trustworthy e-commerce company.

Quantitative Information- There has been a study by PWC in 2022 on consumers, and they found that fast delivery and reliability are the most important factors in buying decisions, after price, indicating the importance of real-time tracking and delivery prediction from the point of winning customers' expectations in the new era. In another study by McKinsey in 2022, it was also found that 15% customer satisfaction and 10% repeat purchase rose with the use of technology in real-time tracking. Also, 65% of people who took part in an eMarketer survey said they were satisfied with their purchases when they could track them. These results are evident that digital fulfillment tools meet the customer expectations and make customers happier and change the way they shop.

4.5.3 Research Question Three- What are the barriers to adoption of digital and automated fulfillment systems, and how can these barriers be mitigated through strategic digital transformation in omni-channel logistics?

4.5.3.1 Study at Reliance Retail Ltd

While Reliance Retail has successfully adopted good automation technology in its fulfillment centers, there are many showstoppers to use it widely, such as integrating technology, cultural resistance (converting from tradition to modern), and infrastructure issues for logistics. As older systems are difficult and integrating the same with new automation technologies is expensive, it is a bigger problem that retailers are facing as a challenge. Knowledge gap becomes a cultural issue for both employees and customers, as they may not want to use new technologies because of a gap in awareness and worry of failure. There is an issue of infrastructure availability, especially in rural areas, which has negative effects on the omni-channel strategy for making reliable logistics.

To address the challenges and mitigate the damage, Reliance Retail has taken some steps to get around these problems by strategic digital transformation projects with localized solutions and robust training (L&D) learning and development, to ensure that digital and automated fulfillment systems are made easy to use for everyone. Reliance Retail has added local languages in the apps to meet the needs of different regions, as India has several regional languages. Localized initiatives boost the acceptance in a wide range of the market in India. They're focused on long-term training programs for the employees to help build the in-house talent who make the new implementation easy. Reliance's big investments in strong digital platforms and analytics tools have made it possible for everything to work together smoothly, solved technical problems, and made logistics operations run more seamlessly. Also, building more infrastructure in rural areas, including tier 3 and 4 cities, has made deliveries more efficient.

Reliance Retail has enabled customers to use digital systems and integrated automated fulfillment systems more easily by removing obstacles and putting money into education, training, localized solutions, and building suitable network and logistics infrastructures. This improves the customer experience overall.

4.5.3.2 A Study of Flipkart

Even though digital and automated fulfilment systems have a lot of benefits, and Flipkart's success story is more around the technology, some bottlenecks make it hard for people to use them. People often suspect the smooth working of an automated system, worry about data privacy, and price inconsistency.

However, Flipkart has solved the problems by better data security, price consistency across the channels, user-friendly interfaces, and customer education programs. Flipkart has invested in strong data protection systems to address the privacy issues of customers and gain trust. Platforms prevent data breaches and unauthorized access and ensure those transactions are safe. Flipkart has kept the same prices across all of its sales channels to prevent confusion among customers. This means that customers will always pay the same price, whether they shop through the app, the website, or another platform, which builds trust and understanding. Flipkart's focus on making a user-friendly interface, which means a wide range of people can use them, even those who want to start digital shopping for the first time and are not familiar with automation technology. Simply, a user-friendly interface encourages more people to shop more easily and enhances the shopping experience. Flipkart focuses on a customer education program; they have started campaigns on the advantages of digital and automation technology by teaching customers. By doing this, Flipkart encourages people to use these systems fearlessly by making things clear, easier, faster, and more personalized. Flipkart ensures that more people trust its digital and automated fulfilment systems by addressing problems and making the customer experience better.

4.5.3.3 A Study of Swiggy India

Digital and automated systems greatly improve operational efficiency and effectiveness, but they are often challenged because of a mix of technological, cultural, and infrastructure problems, and Swiggy also found the barriers of integrating new technology, digital literacy, and cultural resistance. They found that integrating the old systems with new ones is not only difficult but it can also be expensive and risky, as this could cause some problems. People who are new to using advanced technology may find it hard and scary to use it, leading to resistance to using it. This makes it hard to provide the services smoothly, especially in the semi-urban or rural areas, due to infrastructural problems.

However, Swiggy has planned to fix the barriers by emphasizing making the platforms easy to use for all kinds of people in terms of digital skills, with an intuitive UI/UX. They also take initiatives for educating customers through awareness campaigns and putting resources for teaching customers about the features and advantages of the digital tools, and enable them to use. Swiggy keeps improving its technology backbone to get around systemic problems, which include automating last-mile delivery, using AI for forecasting, and cloud-based logistics platforms. They have initiated these changes in line with best practices in the industry and what has been found about omni-channel logistics transformation by the researchers. They emphasize the need for a mix of new technology, customer-focused design, and adaptability to different regions (Klaus, 2019; Lee et al., 2022).

4.5.3.4 A look at Amazon in India and the Middle East

Digital and automated fulfilment systems have many advantages. However, there are no showstoppers on the customer side; they are not widely used. These are technological complexity, Trust and security concerns, and a gap in the digital infrastructure. There are some people, especially in rural areas, who have trouble in using the digital interface and automation technology system. Users are worried about the misuse of personal information and data breaches. Due to a gap in digital Infrastructure, people can't do much business on digital platforms, especially in areas where the internet isn't always reliable.

However, Amazon has initiated specific digital transformation to meet these challenges, such as the Amazon easy program, voice search and Alexa-powered shopping, visual search through mobile app, and localized initiatives that started in India and helped people shop in small towns. The platform also has interfaces in different regional languages, which makes

digital commerce more accessible to people in India who speak different languages. with specific digital transformation plans.

The Amazon Easy program in India helps people shop in small towns, making it easier for them to learn and build trust in digital services. The platform also has interfaces in different regional languages, which makes digital commerce more accessible to people in India who speak different languages. Amazon's voice search and Alexa-powered shopping, and visual search through mobile apps enable customers who are comfortable with traditional text-based interfaces, making them more accessible and user-friendly. Amazon's strategic investments in digital transformation for localization can help more people use automated fulfillment systems by overcoming problems with infrastructure, culture, and behavior.

4.5.3.5 Example at Talabat in the GCC

Barriers and ways to get around them

In the adoption of the digital transformation and automation technology, Talabat finds the problems of concern raised about data privacy and security, technological accessibility, and trust in automation. With worry about data privacy and security, people may hesitate to use digital platforms. It is harder to adopt the digital platforms because of technological accessibility, in line with not having the right technology or internet. Also, people hesitate to buy an automated system unless they trust that it will work and be safe.

As a forward-looking plan to lessen the damage, Talabat believes that better data security and infrastructure development can break the barriers, such as strong cybersecurity protocols and clear data usage policies, to ease worries about privacy. Investing in technology infrastructure to make sure that everyone who is shopping online can get around technological problems. Educating consumers about the benefits and safety of automated systems helps consumers trust the technology and use it.

Talabat focuses on safety improvement and community engagement. They have added in-app telematics for two-wheeler riders and monitor their driving, which makes it safer and more reliable. The company actively seeks customer feedback through surveys and focus groups to understand and address concerns, fostering trust and improving services.

This has a positive impact on higher adoption rates and better customer loyalty. Now, there are more people using digital and automated fulfillment systems by breaking down barriers through planned actions. Customers stay loyal to a service as they feel like their problems are being solved. This leads to long-term customer retention.

4.5.3.6 A case study at noon.com in the GCC

Even though e-commerce is growing rapidly in the Middle East and North Africa (MENA) region, there are still a number of obstacles to the use of digital and automated fulfillment systems by everyone, such as concerns about payment preferences and digital literacy. A lot of people still raise concerns and don't believe whether products are real and whether online platforms are trustworthy. Payment mode preference as cash on delivery by a large number of customers makes it hard to automate the whole process. Due to a lack of digital Literacy, i.e., different levels of digital skills among users, it makes it hard for them to use automated systems smoothly, especially in the geography of Egypt and Saudi Arabia, where people still have trouble getting credit or not having enough access to the internet (Campaign Middle East, 2020).

As a forward-looking plan to lessen the damage, noon.com is using specific strategies like product integrity measures, flexible payment options, and customer education to deal with these problems ahead of time that fit with its goals for digital transformation. They build trust with customers as there is an expert team of integrity by well-known brands that is in charge of ensuring products are real. They have flexible payment options, i.e., customers can pay in

a variety of options such as cash on delivery, pre-paid, and wallet payment to meet the customers' expectations. Noon.com invests in digital literacy to educate customers to make the platform user-friendly and provide strong customer support, which enhances customers' confidence to use its platforms. These strategies break the adoption barriers and increase consumers' trust and engagement through well-planned digital transformation projects.

4.5.4 Summary of Mixed-Method Analysis (Source: Case Studies)

Evolving consumer expectations for faster, personalized service have driven the rise of automation in omni-channel fulfilment. Companies like Reliance Retail, Flipkart, Swiggy, Amazon, Talabat, and Noon.com are leveraging AI, ML, IoT, and AR to meet these demands. For example, Reliance uses AI and AR for personalization and faster order processing through Kirana integration. Flipkart uses AGVs and predictive tools, while Swiggy employs ML to reduce delivery times and improve retention. Real-time tracking and predictive delivery have improved transparency, trust, and customer satisfaction, directly influencing repeat purchases and brand loyalty. Studies show these tools increase customer satisfaction by 15% and repeat purchases by 10%.

Despite benefits, barriers like legacy system integration, digital illiteracy, infrastructure gaps, and trust issues persist. Companies are mitigating these with localized apps, training programs, data security, user-friendly interfaces, and flexible payment options. Reliance focuses on regional access and workforce training, while Amazon and Noon emphasize localization and digital education. These strategies show that successful digital transformation depends on aligning people, processes, and technology.

In summary, automation and digital tools are critical in responding to modern consumer expectations. Businesses adopting user-centric, tech-enabled fulfilment gain a competitive edge through improved efficiency, customer loyalty, and sustained growth.

4.6 Summary of Chapter Four

Consumers' expectations have evolved tremendously for fast delivery, directly influencing the adoption of digital transformation and technology automation in omni-fulfillment. There has been a dramatic shift in the last 30 years. There were no delivery services available for door-to-door pick-up and delivery with a timeline before 1989 in India (Gati launched it 1st time in 1989), and now there is ultra-fast delivery in 10 minutes (Blinkit and Zepto, post-COVID-2022). As speed in delivery has become a norm with network penetration, cost-effective internet, and development of mobile apps, the eCommerce, Retail, and logistics industries are leveraging the technology and digital transformation to meet the customer expectation, building brands, enhancing repeat sales, gaining customer loyalty, and ultimately positioning themselves well in the market in such a competitive era. There are various strategies adopted for digital transformation and technology automation in omni channel fulfillment such as warehouse management system (WMS), transport management system (TMS), Order management system (OMS) including the feature of auto allocation with hopping system, Auto replenishment system (ARS), Warehouse intelligence system (WIS) with digital twin, Auto sortation system, picking from RFID, voice picking, Put-to-light, pick-to-light, and the API integrations. The bigger Organisations have started introducing robot technology for making the fulfillment center fully automated for order processing, i.e., from person to goods (P2G) to Goods to person (G2P). There have been concepts developed in omni-channel, for e.g., Ship from stores (SFS), Dropship, Endless aisle, Dark stores, and Hyper-local delivery services, to ensure orders are processed and delivered to the customers from the nearest proximity.

Though delivery speed has improved dramatically, the personalization needs to be more focused. There is an emergence of AI-driven personalization, such as targeted promotions or adaptive preferences, which is yet to be implemented widely.

Real-time tracking of orders and predictive delivery are now basic consumer expectations, and these are no longer a luxury. While real-time tracking improves the transparency and reduces the anxiety about delay in delivery, the predictive delivery improves the convenience and allows consumers with flexibility, for e.g., rescheduling, updated ETA (expected time of arrival), and

slotted delivery. The real-time tracking and predictive delivery together influence repeat purchase, build trust, and ultimately loyalty and retention. Consumers feel empowered by doing the tracking or checkout themselves.

Organizations have adopted many strategies around digital transformation and technology automation to ensure meeting the consumers' expectations, such as GPS-enabled fleet tracking, API integration between Order management system (OMS), and last mile platform, updated with automated SMS, WhatsApp throughout the order journey to track the orders in real time. Also, the AI-driven expected delivery date and time confirmation during check-out gives customers confidence to predict the delivery. Organizations have set up the control towers with dashboards using the BI tools (business intelligence), such as Jio-Analytics platform, Omnivio, and more. Organizations use the Warehouse Intelligence System (WIS) with a digital twin to monitor operations and improve efficiency.

While strategic initiatives of digital transformation and automation have evolved the consumer expectations for fast delivery and personalization with real time tracking and predictive delivery, in the Omni-channel, Organizations face many barriers to implement the new technologies, such as investment cost, legacy system, and resistance to change are the major internal challenges, and vendor dependency, supply chain unpredictability, and compliance hurdles are the external ones. High initial investment and delayed return on investment (ROI) become an issue for implementation. Integration of the old system with the new ERP/WMS has been challenging; in addition, poor data quality affects the performance of automation. The employees' fear about learning new technology and job retrenchment is the most common but a critical internal challenge in adoption. Vendor reliability, especially 3rd party tech failures, affects performance and is considered to be an external factor. The rollout speed becomes an issue due to regulatory compliance, such as data protection laws. Supply chain volatility is another external challenge that disrupts the automated scheduling and workflows.

Strategic mitigation must focus on people, process, and technology to break the barriers and forward-looking plan, such as phased rollout, User-centric design, training & change management, and integrated planning, are key to success. Pilot programs build internal confidence before going to launch in a full scale. User-centric design approach enhances comfort, for e.g., intuitive UI, and mobile-first systems. Integration planning prevents silo systems and aligns the respective tools like OMS, WMS, TMS, and CRM. Engaging the staff early, skill-building program of the warehouse team through training makes them automation champions for successful implementation, communication helps them know why automation is needed, which is also important for tracking the performance metrics and celebrating automation success.

JioMart and Omnivio have done phased digital rollouts emphasizing training, proactive communication, and pilot testing to mitigate resistance and build acceptance. The Adverb, an automation company works closely with its clients to reduce the integration complexity through automation customization. Organizations also align with people-first change management and Kotter change model, as the action sequence of create urgency > build coalition > empower action > build short-term wins. These methods have positioned themselves as resilient and adaptive. Companies have implemented hybrid systems, like automation and manual.

As per the survey, when 81% of customers rated that delivery speed is high, 62% of customers prefer the delivery on the same day or next day, and 29% people expect delivery within 4 to 6 hours for the same city for groceries. 84% of the group of working professionals and older males have noticed that there is an improvement in delivery speed over the past year. 76% of consumers stated that their buying decision depends on personalization and discount offers. However, 58% have reported that they feel frustrated when personalization is missing during the journey of the order delivery experience, and only 26% of respondents were highly satisfied with personalization.

As per the survey, 93% prefer the retailers who provide real-time tracking; female respondents reported this 100%. 83% of people prefer a live tracking platform. 69% prefer buying from

companies that provide the estimated delivery time. 72% of respondents reported reducing their anxiety about the delay in delivery with real-time updates. 79% of consumers said that the delivery predictive updates, e.g., expected time of arrival (ETA), are very or extremely useful. 72% said that tracking influences repeat purchase.

As per the survey, 54% of consumers trust companies that use visible tech in fulfillment. However, 46% said that they have had bad experiences with systems for lacking coordination, such as no tracking, and inconsistent ETA. 29% of respondents are reported to be uncomfortable with automation; still, female students seem to be the least comfortable. While 47% of consumers want human support as backup, 28% want a user-friendly interface, and 17% want privacy assurances.

Chapter 5: Conclusion

5.1 Summary of the Whole Research

This final chapter outlines the theoretical, managerial, and practical implications of the findings, limitations of the studies, and recommendations for future explorations. It brings the key insights together from the research for the original objectives and questions that guided the study.

This chapter provides a comprehensive discussion of the study's findings, connecting them back to the original research questions and objectives. The chapter reaffirms that growing customer expectations for speed and personalization are key drivers of digital transformation and automation in omni-channel fulfillment. Technologies such as real-time tracking, predictive analytics, and various automated systems (e.g., WMS, TMS, OMS, and robotics-based GTP models) are no longer experimental but have become essential for meeting these demands. These tools not only enhance delivery speed but also build trust, loyalty, and a professional brand image through improved service levels and customer experience.

The research has confirmed that consumer expectations around delivery speed, personalization, and real-time visibility have significantly reshaped the omni-channel fulfillment landscape. Over the past three decades, the industry has evolved from basic logistics services (from 1989) to offering ultra-fast deliveries and tech-driven consumer experiences (post-COVID-19). Digital transformation and technology automation are no longer strategic differentiators; they have become essential to meet the increasingly demanding expectations of modern consumers.

Consumers now expect same-day or even sub-hour deliveries, personalized offers, real-time tracking, and predictive delivery updates as basic service standards. Technologies such as WMS, TMS, OMS, ARS, digital twins, AI, and robotic automation are playing a central role in fulfilling these expectations. Concepts like ship-from-store, dark stores, and hyperlocal delivery are enabling retailers and e-commerce players to optimize last-mile efficiency and proximity-based service.

Despite this progress, significant challenges remain. Both internal (such as high investment costs, legacy systems, employee resistance, and data quality issues) and external (like vendor dependency, compliance hurdles, and supply chain unpredictability) barriers can hinder successful adoption. However, the case studies and survey data suggest that these obstacles can be overcome with well-planned strategies. Phased rollouts, user-centric design, cross-functional collaboration, effective change management, and pilot programs are key enablers of successful implementation. The findings support established theories such as the Technology Acceptance Model and Kotter's Change Model, demonstrating the importance of usability, communication, and short-term wins in enabling successful transformation.

From a managerial standpoint, the research underscores the need for investments in customer-facing technologies and internal integration tools, as well as human resource strategies

focused on reskilling and change management. Practically, the study offers guidance for businesses at various stages of digital maturity, emphasizing flexible, scalable solutions to ease last-mile pressures and improve delivery turnaround.

The study contributes to theory by linking customer behavior to digital adoption in logistics, and to practice by offering actionable strategies to overcome barriers. However, limitations such as a small sample size and a regional focus on India and the Middle East suggest that findings may not fully reflect global trends. Future research should broaden the scope to include more diverse regions and sectors and explore the impact of emerging technologies like generative AI, digital twins, and autonomous logistics.

The survey insights reinforce the strategic importance of delivery speed, personalization, and real-time visibility, not just for customer satisfaction, but also for influencing buying behavior and building brand loyalty. While automation is generally well-received, a notable proportion of consumers still expect human backup and intuitive interfaces, especially among more cautious segments.

In conclusion, digital transformation and automation have become necessities in omni-channel fulfillment, not differentiators. Success lies in aligning technology with people and strategic direction to deliver faster, smarter, and more personalized customer experiences. The successful transformation of omni-channel fulfillment requires a balanced approach, leveraging advanced technologies while aligning with human needs and operational realities. Organizations that effectively integrate people, processes, and technology are better positioned to deliver not only faster but also more personalized and seamless customer experiences in a competitive and rapidly evolving market.

5.2 Reiterate the Key Findings and Analysis

Digital transformation and automation are being driven by consumer expectations (RQ1), real time tracking /visibility and predictive delivery builds trust on brands and loyalty (RQ2), there are challenges, which can be solved with right strategies (RQ3)– The consumers expectations have evolved dramatically and now they are no longer satisfied even with next-day rather many consumers expect instant gratification i.e., sometimes in within 10 minutes. Such demand in delivery pushes retailers, Quick-commerce, and logistics providers to look for advanced tools to keep up the speed with real-time tracking, SMS, predictive delivery, and customization. The technology like WMS (warehouse management system), TMS (transport management system), OMS (order management system), ARS (Auto replenishment system), auto sortation systems, SFS (ship from store), drop ship, dark store concept, and converting larger fulfillment centers from PTG (person to Goods) to GTP (Goods to person) with robotics are no longer experimental rather they are becoming the standard. Personalization in fulfillment is increasingly viewed as a core value offering, and it's no longer optional. These tools help organizations build trust and loyalty and a sense of reliability and professionalism in the brand by improving the service level, reducing the turnaround time, and enhancing overall customer experience. Despite the organization's face barrier and real challenges in adoption of technology automation (ranging from high cost and data integration issues to employee resistance), these problems are possible to solve as many of the organizations have navigated it successfully through change management practices, robust training, phased rollouts, and cross-functional collaboration. Eventually, digital transformation and automation in order fulfillment are as much about people as it is about technology.

5.3 Contributions to the Existing Body of Knowledge

This research offers various practical contributions to the literature on consumer behavior impact on digital transformation and automation in omni-fulfillment. Theoretically, the study enhances understanding of the critical linkage between consumer expectations (for delivery speed and personalization) and adoption of digital and automation, real-time tracking, and predictive delivery tools, and barriers to adoption. The data integration of qualitative and quantitative perspectives provides breadth and depth to the trends of automation technology in the evolving era of customers' expectations.

Practically, the study develops an actionable strategy to mitigate the barriers to adoption of digital transformation and automation in omni-fulfillment and logistics, such as a centric interface, phased rollouts, pilot project, hybrid-automation, transparency in privacy practices, training, and support system. cross-functional integration, and effective change management.

5.4 Limitations of the Present Study

Though the study overall has yielded useful insights, a few limitations must be acknowledged, such as a small sample of 118, with set question limits that limit the breadth of perspectives, especially in terms of diversity of fulfillment across areas and the business models. Also, the limited case studies of 6 companies and most case studies were India and Middle East-centric, may not fully reflect global trends in digital transformation and automation in omni-fulfillment. The study does not deeply cover global fulfillment and logistics trends, rural areas, supply chain financing, or upstream manufacturing automation. Instead, it concentrates on the consumer-facing aspects of retail order fulfillment and logistics that impact customer experience.

5.5 Implications

This research adds to theoretical literature in several meaningful ways, such as supporting the technology acceptance model, highlighting how customers are more likely to engage a tech-enabled environment of order fulfillment, perceived as useful and easy to use. It also aligns with the (Kotter, 1996) change model by illustrating that sense of urgency, communication, and visible short-term wins are key to successful transformation to reduce resistance. This research also adds to managerial implications for retailers and e-commerce businesses, investing in modular fulfillment automation and customer-facing tracking tools. Managerial implications for supply chain and logistics leaders as adoption of tools like control tower dashboards, and digitally integrating warehouse and delivery vehicles through IOT and API improves SLA adherence, delivery accuracy, and provides a seamless experience end-to-end. Managerial implications for HR and change management teams, building reskilling, transformation programs, and cross-functional collaboration, foster greater ownership of new systems. Practical implications as findings actionable insights for business at different stages like SFS (ship from store), Drop ship, Dark stores, Hyperlocal services, semi-automation solutions to alleviate last mile pressures, speed up turnaround time of delivery, and making automation more accessible first and then scalable over time.

5.6 Recommendations

Further, to build on this study, the researchers in the future could consider taking more samples covering remote cities of India and the Middle East, and including global and sectoral perspectives. Investigating sustainability impact and focusing on exploring more emerging technologies such as generative AI, digital twins, and autonomous logistics.

5.7 Future Scope of the Study

While this study has explored the evolution of consumer expectations in new era and role of digital transformation and automation in omni-channel fulfillment, several areas remain open for further research and analysis such as AI-Driven Personalization at scale, Consumer behavior and trust in Automation, Impact of Real-time tracking on customer retention, Integration challenges in legacy system, ROI and cost-benefit analysis of Automation, Change management and workforce readiness, Data privacy and compliance in tech-enabled fulfillment, Role of robotics and intelligent automation, Hyperlocal and micro-fulfillment models, Cross-cultural and regional comparative studies

5.8 Final Thoughts

This research affirms that the delivery speed has evolved dramatically through the adaptation of advanced and efficient technology for order fulfillment with real-time tracking and delivery

prediction. The digital transformation and technology automation are no longer differentiators, but these are essential for competition in the current landscape of omni-channel fulfillment. However, as a continuous improvement, aligning systems, people, and strategy along with technology is critical. Integrating intelligent tools with human adaptability will be the future of logistics to deliver not just faster but smarter and more meaningful customer experiences. Also, personalization is an emerging consumer expectation.

Glossary

API (Application Programming Interface): A set of protocols and tools that allow different software applications to communicate with each other.

AI (Artificial Intelligence): Simulation of human intelligence in machines that can perform tasks such as learning, reasoning, and problem-solving.

AGV (Automated Guided Vehicle): A mobile robot used in warehouses or factories to transport materials without human intervention.

ARS (Auto Replenishment System): A system that automates stock replenishment based on inventory levels and demand forecasting.

B2B (Business to Business): A type of commerce where transactions occur between businesses rather than between a business and individual consumers.

COD (Cash on Delivery): A payment method where the customer pays for goods at the time of delivery.

CRM (Customer Relationship Management): A system or strategy for managing a company's interactions with current and potential customers.

CX (Customer Experience): The overall perception a customer has of a brand based on their interactions across all touchpoints.

DOD (Demand Draft on Delivery): A payment method where a demand draft is provided upon delivery, similar to COD but using bank instruments.

DWS (Dimensioning, Weighing, and Scanning): A system used in logistics for capturing item dimensions, weight, and barcode information.

EAN (European Article Number): A standard barcode format used internationally to identify products.

ETA (Expected Time of Arrival): The anticipated date and time when a shipment or delivery will reach its destination.

F&R (Forecasting and Replenishment): The process of predicting demand and restocking inventory accordingly.

FAQ (Frequently Asked Questions): A list of common questions and answers, usually provided to assist users.

GDPR (General Data Protection Regulation): A regulation in EU law that governs data protection and privacy for individuals.

GTP (Goods to Person): A warehouse automation model where products are brought to the picker via machines or robotics.

GOV (Gross Order Value): The total value of all orders placed before any deductions like discounts or returns.

GPS (Global Positioning System): A satellite-based system used for determining the location and navigation of objects.

HHD (Handheld Device): Portable electronic devices used in logistics for scanning, tracking, and data input.

ML (Machine Learning): A subset of AI that enables systems to learn and improve from experience without explicit programming.

NPS (Net Promoter Score): A metric used to measure customer satisfaction and loyalty based on the likelihood of recommending a company.

OMS (Order Management System): A system that manages the lifecycle of customer orders in retail and e-commerce.

PTG (Person to Goods): Traditional order picking model where workers move to products to fulfill orders.

POS (Point of Sale): The location and system where retail transactions are completed.

PO (Purchase Order): A formal document issued by a buyer to a seller indicating types, quantities, and agreed prices for products or services.

POD (Proof of Delivery): Confirmation that a delivery has been completed successfully, often signed by the recipient.

RBV (Resource-Based View): A management theory that views firm resources as key to superior performance and competitive advantage.

ROI (Return on Investment): A measure used to evaluate the efficiency or profitability of an investment.

SFS (Ship from Store): A fulfillment model where online orders are shipped directly from physical retail stores.

TAM (Technology Acceptance Model): A theoretical model that explains how users come to accept and use a technology.

TAT (Turnaround Time): The amount of time taken to complete a process or fulfill an order.

TMS (Transport Management System): A software system that helps businesses plan, execute, and optimize transportation operations.

UTAUT (Unified Theory of Acceptance and Use of Technology): A model that explains user intentions to use a technology and subsequent usage behavior.

UI/UX (User Interface / User Experience): UI refers to the layout and design of digital interfaces, while UX focuses on the overall user interaction and satisfaction.

WIS (Warehouse Intelligence System): A system that provides advanced analytics and real-time visibility into warehouse operations.

WMS (Warehouse Management System): A software solution that controls and manages day-to-day warehouse operations.

References

Accenture. (2023). *Reinventing the Supply Chain for the Digital Consumer*. Accenture Research Report.

Amazon's focus on AI to accelerate deliveries and enhance customer experience. (n.d.). *TechStory*. <https://techstory.in/amazons-focus-on-ai-to-accelerate-deliveries-and-enhance-customer-experience/>

Arabian Business. (2024). *Quick commerce will take over the Middle East shopping landscape*. Retrieved from <https://www.arabianbusiness.com/opinion/quick-commerce-will-take-over-the-middle-east-shopping-landscape>

A blueprint for the future of global logistics. (2024, August 23). *The CDO Times*. <https://cdotimes.com/2024/08/23/case-study-amazons-ai-driven-supply-chain-a-blueprint-for-the-future-of-global-logistics/>

BrandEquity. (2022, October 12). *Swiggy: Connecting emotionally with customers, the Martech way*. <https://brandequity.economictimes.indiatimes.com/news/marketing/connecting-emotionally-with-customers-the-martech-way/93843408>

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Comparably. (n.d.). *Swiggy NPS & customer reviews*. <https://www.comparably.com/brands/swiggy>

Charlie, A. (2023, June 1). *Amazon India puts the customer first, always*. About Amazon India. Retrieved August 26, 2025, from <https://www.aboutamazon.in/news/innovation/amazon-india-puts-the-customer-first-always>

- Chokshi, S. (2021). *Decoding e-commerce: The impact on retail transformation*. Khaleej Times. Retrieved from <https://www.khaleejtimes.com/business-technology-review/decoding-e-commerce-the-impact-on-retail-transformation>
- Christopher, M., & Peck, H. (2020). *Logistics & Supply Chain Management*. Pearson Education.
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Choueiri Group. (2020, April 13). *The invisible barriers to the adoption of accelerated digital shopping*. Campaign Middle East. <https://campaignme.com/the-invisible-barriers-to-the-adoption-of-accelerated-digital-shopping/>
- Deloitte. (2020). *Digital transformation survey: Unlocking value through intelligent workflows & digital pivots* [Report]. Deloitte Insights. <https://www2.deloitte.com/us/en/insights/topics/digital-transformation/digital-transformation-survey.html>
- Deloitte. (2021). *Consumer Insights: Adapting to the new normal in Indonesia* [Report]. Deloitte Insights. <https://www2.deloitte.com/mm/en/pages/consumer-business/articles/consumer-insights-id-2021.html>
- Deloitte. (2023). *The Digital Supply Chain: Creating Value Through Technology Transformation*. Deloitte Insights.
- DHL. (2023). *Digitalization and e-commerce logistics in the Middle East*. DHL Insights Report.
- Economic Times. (2023, May 1). *Our goal is to shape the future of the food delivery industry in India*. <https://hospitality.economictimes.indiatimes.com/news/operations/food-and-beverages/our-goal-is-to-shape-the-future-of-the-food-delivery-industry-in-india/99904792>
- eMarketer. (2023). *The importance of real-time tracking in delivery services: Meeting consumer expectations*. Zeew. <https://zeew.eu/the-importance-of-real-time-tracking-in-delivery-services-meeting-consumer-expectations/>
- Entrackr. (2024). *Swiggy crosses Rs 4,000 Cr revenue in Q3 FY25, InstaMart grows 2.1X*. <https://entrackr.com/news/swiggy-crosses-rs-4000-cr-revenue-in-q3-fy25-instamart-grows-21x-8693145>
- ET Now. (2025). *Swiggy Q3 FY2025 results OUT! Loss widens to Rs 799 Cr - Check revenue, other quarterly earnings details*. <https://www.etnownews.com/markets/swiggy-q3-fy2025-results-out-loss-widens-to-rs-799-cr-check-revenue-other-quarterly-earnings-details-article-117948170>
- EY India. (2022). *Future of Supply Chain in India: Digitization and Resilience*. Ernst & Young Report.
- Flipkart CEO. (2024, February 13). *Logistics' cost structure biggest challenge for e-commerce: Flipkart CEO*. *Business Standard*. https://www.business-standard.com/companies/start-ups/logistics-cost-structure-biggest-challenge-for-e-commerce-flipkart-ceo-124021300823_1.html
- Flipkart Commerce Cloud. (n.d.). *How Flipkart Commerce Cloud boosted omnichannel retail*. *Flipkart*. <https://www.flipkartcommercecloud.com/flipkart-commerce-cloud-omnichannel-advantage/>
- Flipkart. (2024, April 10). *How Flipkart is using automation to deliver your products on time*. *YourStory*. <https://yourstory.com/2019/04/ecommerce-flipkart-automation-logistics-ekart-delivery>

Flipkart. (2024, April 10). How Flipkart is enhancing its supply chain with robotics and machine learning. *LiveMint*. <https://www.livemint.com/technology/tech-news/how-flipkart-is-enhancing-its-supply-chain-with-robotics-machine-learning-1555261532605.html>

Flipkart. (2024, April 10). At Flipkart, all our efforts are driven by customer needs. *Elets CIO*. <https://cio.eletsonline.com/interviews/at-flipkart-all-our-efforts-are-driven-by-customer-needs/69196/>

Flipkart. (2024, April 10). How Flipkart leverages data analytics to create e-commerce strategies. *ET CIO*. <https://cio.economictimes.indiatimes.com/news/business-analytics/how-flipkart-leverages-data-analytics-to-create-e-commerce-strategies/103573719>

Flipkart. (2024, April 10). Beyond customization: The power of technology-driven personalization in e-commerce. *CXOToday*. <https://cxotoday.com/press-release/beyond-customization-the-power-of-technology-driven-personalization-in-e-commerce/>

Forbes India. (2023). *Rethinking Supply Chains From The Lens Of Omni-channel Retailing*. Retrieved from <https://www.forbesindia.com/article/iim-bangalore/rethinking-supply-chains-from-the-lens-of-omnichannel-retailing/66805/1>

Ghosh, T. (2025). *Combating the bullwhip effect in rival online food delivery platforms using deep learning*. arXiv. <https://arxiv.org/abs/2503.22753>

Gupshup. (n.d.). *Swiggy ups engagement 2.3X via conversational marketing*. <https://www.gupshup.io/resources/case-studies/swiggy>

Gupta, R. (2019). *Evolution of Logistics and Supply Chain Industry in India*. *Indian Journal of Logistics*, 7(2), 33–45.

GreenLine Mobility Solutions. (2024, December 2). India's GreenLine Mobility to deploy 25 LNG trucks to Flipkart. *Reuters*. <https://www.reuters.com/business/autos-transportation/indias-greenline-mobility-deploy-25-lng-truck-flipkart-2024-12-02/>

Hübner, A., Wollenburg, J., & Holzapfel, A. (2016). *Retail logistics in the transition from multi-channel to omni-channel*. *International Journal of Physical Distribution & Logistics Management*, 46(6–7), 562–583.

Inc42. (2024). *Swiggy's FY24 loss nearly halves to INR 2,350 Cr*. <https://inc42.com/buzz/swiggys-fy24-loss-nearly-halves-to-inr-2350-cr-revenue-up-36/>

Infosys. (n.d.). Barriers and accelerators in retail's digital transformation. *Infosys*. <https://www.infosys.com/iki/research/retail-industry.html>

Indian Retailer. (2023). *Reliance Retail to launch omni-channel shopping across all formats*. Retrieved from <https://www.indianretailer.com/article/whats-hot/trends/Reliance-Retail-to-launch-omni-channel-shopping-across-all-formats.a3439>

India Retailing. (2024). *Reliance Retail - India Retailing*. Retrieved from <https://www.indiaretailing.com/reliance-retail-case-study/>

India Retailing. (2024). *Reliance Retail eyes blockchain for security, 5G for AR-powered in-store navigation: Suman Guha, CPTO*. Retrieved from <https://www.indiaretailing.com/2024/06/13/reliance-retail-suman-guha-cpto-interview/>

Internet Retailing. (2021). *Social media driving ecommerce in Middle East, latest RetailX report finds*. Retrieved from <https://internetretailing.net/social-media-driving-ecommerce-in-middle-east-latest-retailx-report-finds/>

Ivory Researchers. (2021). *Digital transformation within the UAE's retail sector during the COVID-19 pandemic*. Retrieved from <https://ivoryresearchers.com/digital-transformation-within-the-uaes-retail-sector-during-the-covid19-pandemic/>

Kotter, J. P. (1996). *Leading change*. Harvard Business School Press.

Kvale, S., & Brinkmann, S. (2015). *InterViews: Learning the craft of qualitative research interviewing* (3rd ed.). SAGE Publications.

KPMG. (2022). *The Rise of Quick Commerce and Hyperlocal Delivery Models in Asia*. KPMG Insights.

McKinsey & Company. (2021). *Title of McKinsey Report on Customer Delivery Expectations and Brand Loyalty*. McKinsey Insights. <https://www.mckinsey.com/insights/>

McKinsey & Company. (2022). *Enhancing customer satisfaction with real-time shipment tracking*. EOXS. https://eoxs.com/new_blog/enhancing-customer-satisfaction-with-real-time-shipment-tracking/

McKinsey & Company. (2023). *Omnichannel Retail and the Next Normal of Consumer Behavior*. McKinsey Insights

Muscat Daily. (2024). *Talabat: Shaping the future of food delivery in Oman*. Retrieved from <https://www.muscatdaily.com/2024/04/21/talabat-shaping-the-future-of-food-delivery-in-oman/>
Noon.com. (n.d.). *Noon.com case study*. Google Cloud. <https://cloud.google.com/customers/noon-com>

Noon.com. (n.d.). *Noon.com: Driving growth and innovation across the Middle East to serve online shoppers better*. The Boss Story. <https://thebossstory.com/noon-com-driving-growth-and-innovation-across-the-middle-east-to-serve-online-shoppers-better/>

Noon.com. (n.d.). *Noon*. Royex Digital. <https://royexdigital.com/case-study/noon/>

Noon.com. (2022, November 10). *Noon.com and ADIO partner on UAE's largest e-commerce fulfilment centre facility developed by KEZAD*. Invest in Abu Dhabi. <https://www.investinabudhabi.gov.ae/News/Noon-com-and-ADIO-partner-on-UAEs-largest-e-commerce-fulfilment-centre-facility-developed-by-KEZAD>

Noon.com. (2022, November 23). *KEZAD Group breaks ground on the UAE's largest e-commerce fulfilment centre for Noon.com*. AD Ports Group. <https://www.adportsgroup.com/en/news-and-media/2022/11/22/keza-group-breaks-ground-on-the-uaes-largest-e-commerce-fulfilment-centre-for-noon>

PWC. (n.d.). *Consumer behavior, digital innovation drive e-commerce boom*. Arab News. <https://www.arabnews.com/node/2253691>

PwC. (2022). *Middle East Retail and Consumer Outlook 2022*. PricewaterhouseCoopers.

LiveMint. (2024). *IPO-bound Swiggy trims FY24 loss by 43%, buoyed by food delivery, Instamart*. <https://www.livemint.com/companies/ipobound-swiggy-trims-fy24-loss-by-43-buoyed-by-food-delivery-instamart/amp-11725464463932.html>

ResearchGate. (2019, June 17). *Digitalisation: Helping companies transform their logistics & supply chain models*. *India Retailing*. <https://www.indiaretailing.com/2019/06/17/digitalisation-helping-companies-transform-their-logistics-supply-chain-models/>

ResearchGate. (2024, March 1). *Navigating digital transformation: Retail leaders share key challenges in adopting an omnichannel retail strategy*. *Economic Times*. <https://retail.economictimes.indiatimes.com/news/industry/navigating-digital-transformation-retail-leaders-share-key-challenges-in-adopting-an-omnichannel-retail-strategy/108141279>

ResearchGate. (2024, March 1). *Adoption barriers in engaging young consumers in omnichannel retailing*. *ResearchGate*. https://www.researchgate.net/publication/336735767_Adoption_barriers_in_engaging_young_consumers_in_the_Omni-channel_retailing

ResearchGate. (2024, August 16). Transitioning to omnichannel retail: Challenges and strategies from a qualitative perspective. *India Retailing*.
<https://www.indiaretailing.com/2024/08/16/omnichannel-retail-strategies/>

Retail Mantra. (2023). *Can Reliance Pull Off the Kirana & Jio Omni-Channel Retail Strategy?*. Retrieved from <https://www.retailmantra.com/can-reliance-pull-of-kirana-jio-omni-channel-strategy/>

Retail Mantra. (n.d.). *Can Reliance pull off the Kirana & Jio omni-channel retail strategy?* Retrieved May 3, 2025, from <https://www.retailmantra.com/can-reliance-pull-of-kirana-jio-omni-channel-strategy/retailmantra.com>

Retrieved April 30, 2025, from
<https://www.icmrindia.org/casestudies/catalogue/Marketing/MKTG420.htm>

Reuters. (2024, June 11). *Indians get hooked on 10-minute grocery apps, squeezing small retailers*. <https://www.reuters.com/business/retail-consumer/indians-get-hooked-10-minute-grocery-apps-squeezing-small-retailers-2024-06-11/>

Reuters. (2024, September 26). *Swiggy files for \$1.25 bln IPO in India's booming stock market*. <https://www.reuters.com/markets/deals/indias-swiggy-files-375-bln-rupee-ipo-quick-commerce-booms-2024-09-26/>

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Shankar, A., & Jain, M. (2024). Retrieved April 30, 2025, from
<https://www.researchgate.net/publication/387210861>

Shipsy. (2022, December 5). *Decoding e-commerce: The impact on retail transformation*. Khaleej Times. <https://www.khaleejtimes.com/business-technology-review/decoding-e-commerce-the-impact-on-retail-transformation>

Strategize, Customize, Localize: How Amazon succeeded in India. (n.d.). *Localization Institute*. <https://www.localizationinstitute.com/strategize-customize-localize-analysis-how-amazon-succeeded-in-india/>

Talabat. (2024). *Pioneering the future of food delivery in Oman*. Oman Tenders & Business Gate. Retrieved from <https://omantendersgate.com/talabat-pioneering-the-future-of-food-delivery-in-oman/>

Talabat. (2024). *A responsible tech leader in the Kingdom!*. Talabat Blog. Retrieved from <https://blog.talabat.com/talabat-a-responsible-tech-leader-in-the-kingdom/>

Times of India. (n.d.). *Amazon may use AI to reduce delivery time, here's how*. <https://timesofindia.indiatimes.com/gadgets-news/amazon-may-use-ai-to-reduce-delivery-time-heres-how>

Udayakumar, N., & Nagarajan, S. K. (2024). The impact of real-time order tracking on customer satisfaction and loyalty in Chennai's online food delivery services. *Journal of Computational Analysis and Applications*, 12(3), 45-60. Retrieved from <https://eudoxuspress.com/index.php/pub/article/view/1116>

Unleashed Software. (2023, November 15). *What is omnichannel fulfillment? Meaning and benefits*. <https://www.unleashedsoftware.com/blog/omnichannel-fulfilment/>

Verhoef, P. C., Kannan, P. K., & Inman, J. J. (2021). *From multi-channel to omni-channel retailing: Introduction to the special issue on multi-channel retailing*. *Journal of Retailing*, 97(1), 1–3.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

Appendix 1: Consent Form

This form is to confirm your consent to take part in a research study. Your participation is voluntary, and you are free to withdraw at any time without any penalty.

Researchers Contact information:

Name: Krishna kant Pandey

Email: kk_pandey76@yahoo.com

Course Name: Executive Doctorate in Business Administration

Name of University: East Bridge University

Guide: Dr Saranya Desikan

Registration Number: EBU631062

Research Title: Consumer Behaviour Impact on Digital Transformation and Automation in Omni-Channel Fulfilment Systems

Study Descriptions:

Purpose of Research: explore and analyse how evolving consumer behaviors and expectations for delivery speed and personalization influence the adoption and effectiveness of digital transformation and automation technologies

Survey Participation: The participants of this research survey are requested to complete it to help data collection.

Duration of participation:

Confidentiality: Your participation will remain confidential. Data collected will be anonymized, and any personal identifiers will be excluded from any reports or publications resulting from this research.

Consent:

- ✓ I have read the above information.
- ✓ I have allowed to ask questions and any questions and answered best of my knowledge and beliefs.
- ✓ I here by giving consent to take part in this survey.

Participant’s Name:

Participant’s Signature:

Date:

Appendix 2: Interview Schedule

RQ1 -How do changing consumer expectations for delivery speed and personalization drive the adoption of automation technologies in omni-channel fulfillment systems?

- How have customer expectations for faster delivery changed over time?
- What automation tools or systems have you started using to meet expectations /demand?

RQ2 -How do real-time tracking and predictive delivery tools (enabled by digital transformation) impact consumer satisfaction and purchasing behavior in omni-channel retail?

- Have you implemented real-time tracking or predictive delivery features into your fulfilment process? If so, how?
- What role do you think these tools play in the overall customer experience?

RQ3 -What are the barriers to consumer adoption of digital and automated fulfillment systems, and how can these barriers be mitigated through strategic digital transformation in omni-channel logistics?

- What internal or external challenges do you face when implementing automated solutions?
- What strategies have been most effective in increasing adoption and seamless implementation?

Appendix 3: Survey Questionnaire – Consumers

Section A: Demographics

1. Age Group
☐ 18–29 ☐ 30–49 ☐ 50+
2. Gender
☐ Male ☐ Female ☐ Prefer not to say
3. Location
☐ India ☐ UAE ☐ Other GCC (Oman, Qatar, Saudi Arabia, etc.)
4. Occupation
☐ Student ☐ Working Professional ☐ Entrepreneur ☐ Homemaker

Section B: RQ1 – Delivery Speed & Personalization

1. On a scale of 1–5, how important is fast delivery in your online shopping experience?
 (1 = Not important, 5 = Extremely important)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

- 2. On a scale of 1–5, how satisfied are you with personalization (e.g., recommendations, offers)?
(1 = Very dissatisfied, 5 = Very satisfied)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- 3. Have you noticed improvements in delivery speed over the last year?
☐ Yes ☐ No
- 4. Does faster delivery influence your decision to buy from a specific brand or platform?
☐ Yes ☐ No

Section C: RQ2 – Tracking & Predictive Tools

- 1. Do you prefer retailers that offer real-time delivery tracking?
☐ Yes ☐ No
- 2. On a scale of 1–5, how satisfied are you with the accuracy of tracking systems?
(1 = Not satisfied, 5 = Very satisfied)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- 3. Does tracking information affect your likelihood to order again from the same retailer?
☐ Yes ☐ No
- 4. On a scale of 1–5, how useful do you find predictive delivery updates (e.g., “Delivered by tomorrow before 4 PM”)? (1 = Not useful, 5 = Extremely useful)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section D: RQ3 – Barriers & Adoption of Automation

- 1. On a scale of 1–5, how comfortable are you using automated services like chatbots, smart lockers, or delivery alerts? (1 = Not comfortable, 5 = Very comfortable)
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
- 2. What are your main concerns with automated fulfillment systems? (Select all that apply)
☐ Lack of human interaction
☐ Errors or technical glitches
☐ Privacy/security concerns
☐ Difficult to use
☐ None
- 3. What would make you feel more comfortable using automation? (Select all that apply)
☐ Clear explanation/tutorials
☐ Human support backup
☐ Privacy guarantees
☐ Easier-to-use interfaces
☐ Other: _____

Section E: Open Feedback (Optional)

Please share any additional thoughts or suggestions regarding your experience with delivery, personalization, tracking, or automated services:

Response: _____

Appendix 4: Survey Questionnaire – Business

Section A: Demographics

- 1. **Industry Type**
☐ Retail / E-commerce
☐ Logistics / Supply Chain
☐ Technology
☐ Other: _____

Section B: RQ1 – Consumer Expectations & Automation

- 1. Has your company adopted automation technologies in response to changing consumer demands?
☐ Yes ☐ No
- 2. If yes, what were the main drivers behind adopting automation? (*Select all that apply*)
☐ Faster delivery speed
☐ Enhanced personalization
☐ Cost reduction

- ☐ Competitive pressure
- ☐ Other: _____

3. On a scale of 1–5, how strongly have consumer expectations influenced your automation strategy?
(1 = *Not at all*, 5 = *Extremely high influence*)
- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section C: RQ2 – Real-Time Tracking & Predictive Tools

1. Has your organization adopted real-time tracking **or** predictive delivery systems?
- ☐ Yes ☐ No
2. After implementation, how would you rate the change in customer satisfaction?
- ☐ Significant improvement
☐ Moderate improvement
☐ No change
3. What benefits have you observed since adopting these tools? (*Select all that apply*)
- ☐ Increased repeat purchases
☐ Fewer customer service inquiries
☐ Improved customer reviews
☐ Reduced delivery delays
☐ Other: _____

Sector D: RQ3 – Barriers & Mitigation Strategies

1. What barriers have you encountered in getting customers to adopt digital or automated fulfillment systems? (*Select all that apply*)
- ☐ Lack of awareness
☐ Resistance to change
☐ Low digital literacy
☐ Concerns about security/privacy
☐ Other: _____
2. Have you used any strategies to overcome these barriers? (*Select all that apply*)
- ☐ Customer education/training
☐ Digital marketing and awareness campaigns
☐ Offering hybrid systems (manual + digital)
☐ Privacy/security assurances
☐ Other: _____
3. On a scale of 1–5, how effective have these strategies been in improving customer adoption?
(1 = *Not effective*, 5 = *Very effective*)
- ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Section E: Open Feedback (Optional)

Please share any suggestions or insights regarding how consumer behavior has influenced your digital transformation and automation journey.

Response: _____

Appendix 5: Ethical Considerations

Participant Consent Acknowledgement

118 responses

Survey	Responses	Yes	No
Consumers	58	58	0
Businesses	60	60	0
Total	118	118	0

Consent:

I have read the above information.

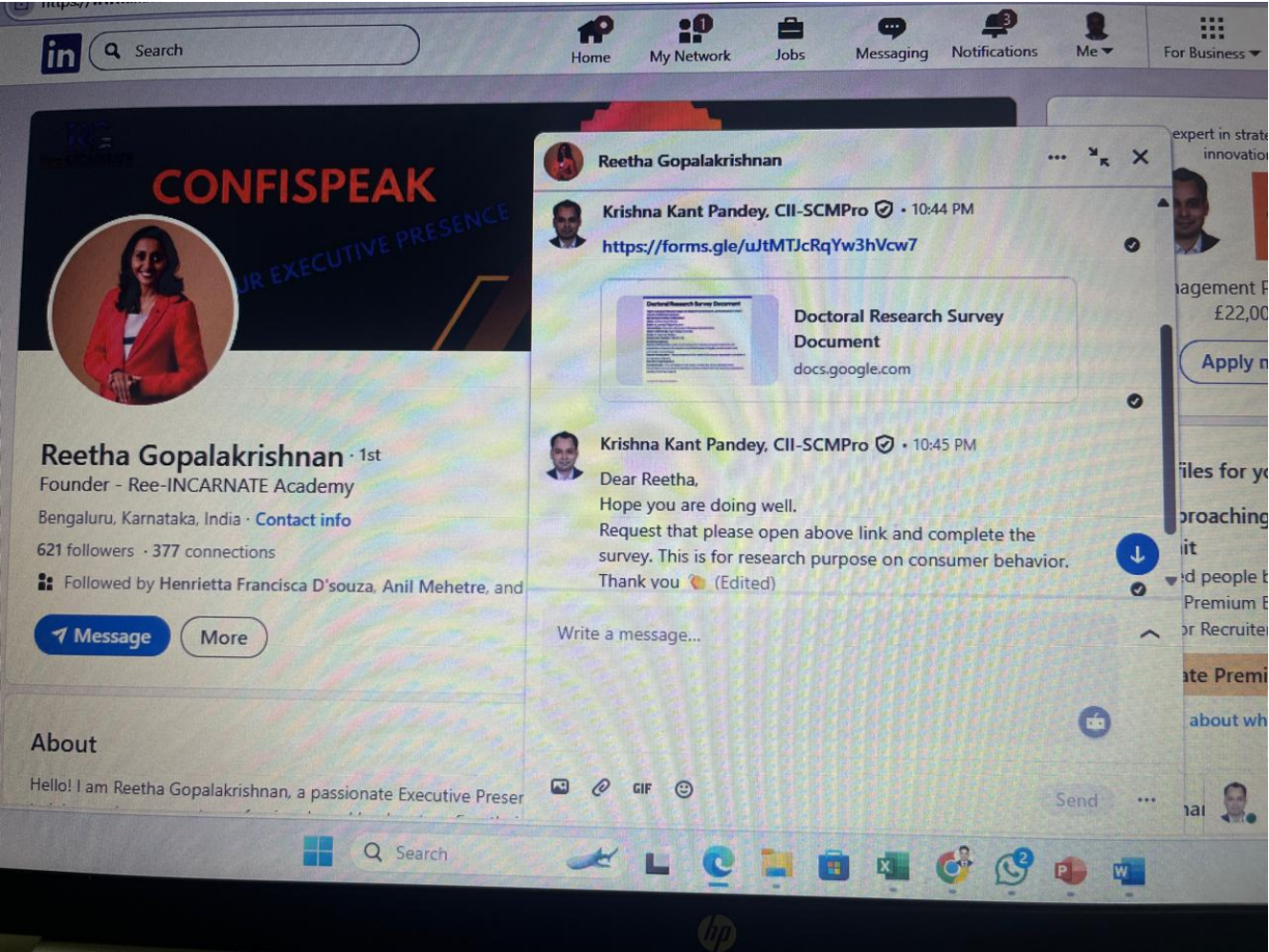
I have allowed to ask questions and any questions and answered best of my knowledge and beliefs.

I here by giving consent to take part in this survey.

☐ Yes

☐ No

Appendix 6: Survey Invitation on LinkedIn




Survey responses
from business.xlsx


Survey responses
from consumers.xlsx