

Impact of Digital Transformation on Logistics and Supply Chain Performance: A Study of Blinkit

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Abstract- *The rapid growth of quick-commerce has transformed logistics and supply chain management through the adoption of advanced digital technologies. Companies are increasingly integrating Artificial Intelligence (AI), Internet of Things (IoT), Big Data Analytics, Cloud Computing, and automation into their operations to improve efficiency, reduce delivery time, and enhance customer satisfaction. Blinkit, one of India's leading quick-commerce platforms, utilizes technology-driven logistics to deliver groceries and daily essentials within minutes. This study investigates the impact of digital transformation on logistics and supply chain performance with special reference to Blinkit. A descriptive research design was adopted, and primary data were collected from 200 Blinkit customers in Karnataka using a structured questionnaire based on convenience sampling. Secondary data were obtained from books, journal articles, company reports, and other reliable academic sources. The collected data were analyzed using Percentage Analysis, Mean Analysis, Pearson Correlation Analysis, and the Chi-Square Test. The findings reveal that Blinkit's digital technologies significantly improve logistics performance by enhancing order processing, delivery efficiency, inventory management, and customer satisfaction. Mean analysis indicates that customers perceive Blinkit's mobile application as user-friendly, while correlation analysis demonstrates a moderate positive relationship ($r = 0.589$) between digital transformation and customer satisfaction. The Chi-Square analysis indicates no statistically significant association between respondents' age and overall satisfaction. The study concludes that digital transformation has become a critical driver of operational excellence and competitive advantage in the quick-commerce sector. The research contributes to the growing body of knowledge on digital logistics by providing empirical evidence from the Indian quick-commerce industry and offers managerial implications for organizations seeking to strengthen supply chain performance through digital innovation.*

Keywords: *Digital Transformation, Logistics, Supply Chain Management, Quick Commerce, Blinkit, Artificial Intelligence, Customer Satisfaction, Inventory Management.*

I. INTRODUCTION

The rapid advancement of digital technologies has fundamentally transformed the way organizations manage logistics and supply chain operations. In today's highly competitive business environment, organizations are increasingly adopting digital solutions such as Artificial Intelligence (AI), the Internet of Things (IoT), Big Data Analytics, Cloud Computing, Automation, and Machine Learning to improve operational efficiency, enhance visibility, optimize inventory, and deliver superior customer experiences. Digital transformation enables organizations to make data-driven decisions, reduce operational costs, improve coordination across supply chain partners, and respond quickly to changing market conditions.

The emergence of e-commerce and the growing expectations of consumers for faster and more reliable deliveries have accelerated the adoption of digital technologies in logistics. Modern supply chains rely heavily on real-time information, predictive analytics, automated warehouse management, intelligent transportation systems, and digital communication platforms. These technologies have significantly improved inventory accuracy, order fulfillment, route optimization, and last-mile delivery, enabling organizations to achieve higher levels of efficiency and customer satisfaction.

In recent years, Quick Commerce (Q-Commerce) has emerged as one of the fastest-growing segments of the retail industry. Unlike conventional e-commerce, which typically delivers products within one or two days, quick-commerce focuses on delivering daily essentials within minutes through strategically located dark stores supported by technology-enabled logistics networks. This business model has revolutionized urban retail by emphasizing speed, convenience, and customer-centric service.

Blinkit, formerly known as Grofers, is among India's leading quick-commerce companies. The company has developed an advanced digital ecosystem that

integrates AI-based demand forecasting, real-time inventory management, automated order processing, route optimization algorithms, cloud-based information systems, and digital payment technologies. These digital capabilities enable Blinkit to process thousands of customer orders efficiently while maintaining high service quality and operational performance.

Although several studies have examined digital transformation in logistics and supply chain management, limited empirical research has specifically investigated its impact within India's quick-commerce sector from the customer's perspective. As quick-commerce continues to expand rapidly, understanding how digital technologies influence logistics performance and customer satisfaction has become increasingly important for both researchers and practitioners.

This study therefore examines the impact of digital transformation on logistics and supply chain performance with special reference to Blinkit. By analyzing customer perceptions regarding digital services, delivery efficiency, inventory availability, and overall satisfaction, the study provides valuable insights into the role of digital technologies in improving logistics performance. The findings are expected to contribute to the existing literature on digital supply chains and offer practical recommendations for organizations operating in the rapidly evolving quick-commerce industry.

II. LITERATURE REVIEW

Digital transformation has become a strategic priority in logistics and supply chain management because of its ability to improve operational efficiency, increase supply chain visibility, and enhance customer satisfaction. Technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), Big Data Analytics, Cloud Computing, Blockchain, and Automation have transformed traditional logistics systems into intelligent and data-driven networks. Researchers have widely acknowledged that these technologies improve decision-making, optimize inventory management, and strengthen supply chain resilience.

Kersten et al. (2021) emphasized that digital transformation enables organizations to improve logistics performance through the integration of AI, IoT, and data analytics. Their study concluded that digital technologies enhance supply chain visibility, reduce operational costs, and support faster managerial decision-making.

Ivanov (2021) highlighted that digital transformation plays a significant role in building resilient supply chains capable of responding to disruptions. The study reported that organizations adopting digital technologies demonstrate greater operational flexibility and improved risk management capabilities. According to Ivanov (2022), Artificial Intelligence has become an essential component of modern logistics by improving demand forecasting, warehouse operations, inventory planning, and transportation management. The research demonstrated that AI significantly reduces operational costs while improving service quality and delivery performance.

Choi (2022) observed that Big Data Analytics enables organizations to analyze customer demand patterns, predict market trends, and optimize logistics operations. The study concluded that data-driven decision-making enhances supply chain efficiency and provides organizations with sustainable competitive advantages.

Christopher (2022) argued that supply chain competitiveness increasingly depends on digital integration among suppliers, manufacturers, logistics providers, and customers. The study emphasized that real-time information sharing improves coordination, responsiveness, and customer service quality.

Wang et al. (2023) reported that organizations implementing cloud computing and automation experience higher productivity, better resource utilization, and improved operational performance. Cloud-based logistics platforms also facilitate collaboration among supply chain partners.

Kumar and Singh (2023) examined digital transformation within logistics organizations and concluded that digital technologies improve inventory control, warehouse productivity, delivery accuracy, and customer satisfaction. Their findings indicated that technology adoption significantly contributes to organizational performance.

Rajesh Singh et al. (2023) found that organizations implementing integrated digital logistics systems achieved substantial improvements in transportation efficiency, inventory visibility, and service quality. The study highlighted customer satisfaction as a major outcome of digital transformation.

Tang (2023) emphasized that digital technologies enhance supply chain resilience by improving information visibility, demand forecasting, and risk management. The research suggested that organizations investing in digital infrastructure are

better prepared to manage uncertainties and market disruptions.

Lee (2023) investigated the role of digital innovation in supply chain resilience and reported that organizations using predictive analytics, AI, and IoT recover more quickly from operational disruptions while maintaining service continuity.

Sheffi (2023) explained that Artificial Intelligence and automation have fundamentally changed logistics operations through intelligent warehouse management, predictive maintenance, and optimized transportation planning. These innovations reduce operational costs while improving delivery reliability. A report by Deloitte (2023) highlighted that digital supply networks improve collaboration, forecasting accuracy, inventory management, and customer responsiveness. Organizations adopting digital ecosystems demonstrated superior operational performance compared to traditional supply chains.

Similarly, McKinsey & Company (2023) reported that companies investing in AI-driven supply chain technologies achieve significant improvements in productivity, delivery performance, and customer experience. The report emphasized that digital transformation has become essential for maintaining competitive advantage.

Research by Hassini, Gunasekaran, and Al Mashalah (2023) demonstrated that digital technologies improve inventory visibility, warehouse coordination, transportation planning, and operational efficiency within e-commerce supply chains. The authors concluded that digital innovation strengthens organizational competitiveness and long-term sustainability.

Recent studies have also highlighted the rapid emergence of quick-commerce as a new business model requiring highly responsive logistics systems. Companies such as Blinkit, Zepto, Instamart, and BigBasket rely extensively on AI-based demand forecasting, dark stores, real-time inventory management, and intelligent route optimization to deliver products within minutes. These technologies have become essential for achieving operational excellence and maintaining customer satisfaction in highly competitive urban markets.

Overall, the literature consistently demonstrates that digital transformation positively influences logistics efficiency, supply chain integration, customer satisfaction, inventory optimization, and organizational competitiveness. However, most

existing studies focus on manufacturing industries, conventional e-commerce, or global supply chains, while relatively few empirical studies investigate digital transformation within India's quick-commerce sector, particularly from the perspective of customers.

3. Research Gap

Although previous studies have extensively examined digital transformation in logistics and supply chain management, several important research gaps remain. First, the majority of existing research has focused on manufacturing organizations, multinational corporations, or conventional e-commerce businesses. Comparatively little empirical evidence is available regarding digital transformation in India's rapidly expanding quick-commerce industry.

Second, most studies primarily examine organizational performance, operational efficiency, or technological implementation from the perspective of managers and organizations. Limited attention has been given to customer perceptions regarding digital logistics services, particularly in relation to delivery speed, inventory availability, order tracking, and overall service satisfaction.

Third, despite Blinkit's emergence as one of India's leading quick-commerce platforms, there is limited academic research evaluating how its digital technologies influence logistics and supply chain performance using primary customer data.

To address these gaps, the present study investigates the impact of digital transformation on logistics and supply chain performance with special reference to Blinkit by analyzing responses from 200 customers in Karnataka. The study provides empirical evidence regarding the relationship between digital transformation, logistics efficiency, and customer satisfaction, thereby contributing to the growing literature on digital supply chain management and quick-commerce.

III. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a descriptive research design to examine the impact of digital transformation on logistics and supply chain performance with special reference to Blinkit. A descriptive approach is appropriate because it facilitates the systematic collection and analysis of customer perceptions regarding digital logistics services, operational efficiency, and overall satisfaction. The study focuses on understanding how digital technologies influence

logistics performance within the quick-commerce industry.

3.2 Research Objectives

The study was conducted with the following objectives:

1. To examine the impact of digital transformation on Blinkit's logistics and supply chain performance.
2. To evaluate the influence of digital technologies on delivery efficiency and customer satisfaction.
3. To analyze customers' perceptions of Blinkit's digital logistics services.
4. To suggest measures for improving logistics and supply chain performance through digital transformation.

3.3 Research Hypotheses

Based on the objectives of the study and the statistical analyses performed, the following hypotheses were formulated:

Hypothesis 1: Relationship between Digital Transformation and Customer Satisfaction

Null Hypothesis (H_{01}): There is no significant relationship between digital transformation and customer satisfaction among Blinkit customers.

Alternative Hypothesis (H_{11}): There is a significant relationship between digital transformation and customer satisfaction among Blinkit customers.

Statistical Tool Used: Pearson Correlation Analysis

Hypothesis 2: Association between Age Group and Customer Satisfaction

Null Hypothesis (H_{02}): There is no significant association between respondents' age group and their overall satisfaction with Blinkit.

Alternative Hypothesis (H_{12}): There is a significant association between respondents' age group and their overall satisfaction with Blinkit.

Statistical Tool Used: Chi-Square Test of Independence

3.4 Data Collection

The study is based on both primary and secondary data sources.

Primary data were collected through a structured questionnaire administered to Blinkit customers using Google Forms. The questionnaire contained demographic questions and statements measuring customer perceptions regarding Blinkit's digital transformation initiatives, delivery performance, inventory availability, and overall satisfaction.

Secondary data were collected from academic journals, books, conference proceedings, company reports, government publications, and other reliable online databases related to digital transformation,

logistics, supply chain management, and quick-commerce.

3.5 Sampling Design

The study employed convenience sampling because respondents were selected based on accessibility and their experience using Blinkit's services.

Particular	Description
Population	Blinkit customers
Sampling Technique	Convenience Sampling
Sample Size	200 respondents
Study Area	Karnataka, India
Research Approach	Quantitative

3.6 Measurement Variables

The study evaluates the relationship between digital transformation and logistics performance using customer perceptions.

Independent Variable

- Digital Transformation

Dependent Variables

- Logistics Performance
- Delivery Efficiency
- Customer Satisfaction
- Supply Chain Performance

The questionnaire included statements measured using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

3.7 Statistical Tools

The collected data were analyzed using descriptive and inferential statistical techniques.

Percentage Analysis

Percentage analysis was employed to describe respondents' demographic characteristics such as gender, age, occupation, usage frequency, and duration of Blinkit usage.

Mean Analysis

Mean scores were calculated to evaluate respondents' perceptions regarding Blinkit's digital platform, delivery performance, and real-time order tracking.

Correlation Analysis

Pearson's Correlation Analysis was applied to examine the relationship between digital transformation and customer satisfaction.

Chi-Square Test

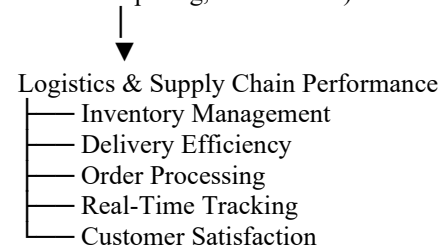
The Chi-Square Test was used to determine whether a statistically significant association exists between respondents' age group and their overall satisfaction with Blinkit.

3.8 Conceptual Framework

The study is based on the assumption that digital transformation positively influences logistics and supply chain performance.

Digital Transformation

(AI, IoT, Big Data Analytics,
Cloud Computing, Automation)



3.9 Scope of the Study

The study is confined to Blinkit customers residing in Karnataka who have experience using the company's quick-commerce services. It investigates customer perceptions regarding digital transformation, logistics efficiency, delivery performance, inventory management, and customer satisfaction. The findings are limited to the selected sample of 200 respondents and the study period.

3.10 Limitations of the Study

The study has certain limitations that should be considered while interpreting the findings.

- The research is limited to 200 respondents from Karnataka.
- Convenience sampling may limit the generalizability of the findings.
- The study focuses only on Blinkit and does not compare other quick-commerce platforms.
- Customer perceptions may change over time due to technological developments and market dynamics.
- The analysis is based on self-reported responses collected through a questionnaire.

IV. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

A total of 200 valid responses were collected from Blinkit customers in Karnataka. The demographic profile indicates that 54.5% of the respondents were male, 45.0% were female, and 0.5% preferred not to disclose their gender. Most respondents (40.5%)

belonged to the 21–30 years age group, followed by 27.0% below 20 years, 25.0% between 31–40 years, and 7.5% above 40 years. Regarding occupation, students constituted the largest group (41.5%), followed by private employees (14.5%), homemakers (13.0%), government employees (11.0%), business owners (10.5%), self-employed respondents (8.0%), and others (1.5%). The majority of respondents used Blinkit either weekly (33.5%) or monthly (33.5%), while 37.5% had been using the platform for 6 months to 1 year. These demographic characteristics indicate that Blinkit is widely used by young consumers who frequently purchase groceries and daily essentials through digital platforms.

4.2 Mean Analysis

The mean analysis was conducted to evaluate customer perceptions regarding Blinkit's digital transformation initiatives and logistics performance.

The analysis revealed that the ease of using the Blinkit mobile application recorded the highest mean score (3.84), indicating that customers generally find the application simple, user-friendly, and efficient for placing orders. Similarly, the statement related to timely delivery obtained a mean score of 3.59, suggesting that respondents were generally satisfied with Blinkit's ability to deliver products within the promised time. The real-time order tracking feature achieved a mean score of 3.56, reflecting positive customer perceptions regarding order visibility and transparency.

Overall, the mean values indicate that customers hold favorable opinions regarding Blinkit's digital platform, logistics operations, and service quality. These findings suggest that digital technologies contribute positively to operational efficiency and enhance the overall customer experience.

4.3 Correlation Analysis

Pearson's Correlation Analysis was employed to examine the relationship between digital transformation and customer satisfaction.

The analysis revealed a moderately positive correlation ($r = 0.589$) between digital transformation and customer satisfaction. The relationship was found to be statistically significant, indicating that improvements in digital technologies are associated with higher levels of customer satisfaction. This finding supports the alternative hypothesis (H_{11}) and rejects the null hypothesis (H_{01}).

The results imply that digital initiatives such as AI-based order processing, real-time inventory management, digital payment systems, and live order tracking significantly enhance customers' shopping

experience. As Blinkit continues to strengthen its digital infrastructure, customer satisfaction is likely to improve further through faster deliveries, better order accuracy, and enhanced service reliability.

These findings are consistent with previous studies, which reported that digital transformation improves logistics efficiency, operational performance, and customer satisfaction within technology-enabled supply chains.

4.4 Chi-Square Analysis

The Chi-Square Test of Independence was performed to determine whether respondents' age group was associated with their overall satisfaction with Blinkit. The analysis produced a Chi-Square value of 17.118 with a p-value of 0.145, which is greater than the 0.05 level of significance. Therefore, the null hypothesis (H_0) was accepted, indicating that there is no statistically significant association between respondents' age group and their overall satisfaction with Blinkit.

This result suggests that customer satisfaction with Blinkit's digital services remains relatively consistent across different age groups. Regardless of age, respondents generally perceived Blinkit's digital platform, delivery efficiency, and logistics services positively. These findings indicate that Blinkit's technology-driven logistics model effectively serves customers belonging to diverse demographic categories.

4.5 Discussion

The findings demonstrate that digital transformation plays a vital role in improving logistics and supply chain performance within the quick-commerce industry. Customers expressed positive perceptions regarding Blinkit's mobile application, delivery efficiency, and real-time order tracking, highlighting the importance of technology in enhancing service quality.

The significant positive correlation between digital transformation and customer satisfaction indicates that investments in AI, automation, cloud computing, and data analytics contribute directly to operational excellence and improved customer experiences. These findings support earlier research that identified digital technologies as key drivers of supply chain efficiency, inventory optimization, and competitive advantage.

The Chi-Square analysis further indicates that customer satisfaction does not vary significantly across age groups, suggesting that Blinkit's digital platform successfully meets the expectations of a

broad customer base. This finding highlights the inclusive nature of digital logistics services and reinforces the growing importance of technology-enabled supply chains in the quick-commerce sector.

Overall, the study confirms that digital transformation has become an essential strategic capability for improving logistics performance, strengthening customer relationships, and achieving sustainable competitive advantage in India's rapidly expanding quick-commerce market.

V. FINDINGS

Based on the analysis of primary data collected from 200 Blinkit customers, the following major findings were identified:

1. The majority of Blinkit users (40.5%) belonged to the 21–30 years age group, indicating that young adults are the primary users of quick-commerce services.
2. Students constituted the largest respondent group (41.5%), followed by private employees (14.5%), suggesting that convenience and time-saving are key factors influencing the use of Blinkit's services.
3. The Blinkit mobile application received the highest mean score (3.84), indicating that customers perceive the application as user-friendly, efficient, and easy to navigate.
4. Customers expressed positive opinions regarding delivery efficiency and real-time order tracking, demonstrating that Blinkit's digital technologies improve logistics service quality.
5. Pearson Correlation Analysis revealed a moderately positive relationship ($r = 0.589$) between digital transformation and customer satisfaction, indicating that improvements in digital technologies positively influence customer experience.
6. The Chi-Square Test showed no significant association between respondents' age group and overall customer satisfaction ($p = 0.145$), suggesting that Blinkit's services are appreciated consistently across different age groups.
7. Overall, the study confirms that digital transformation contributes significantly to logistics efficiency, operational effectiveness, and customer satisfaction within the quick-commerce sector.

VI. MANAGERIAL IMPLICATIONS

The findings of this study provide valuable implications for managers, logistics professionals, and quick-commerce companies.

- Organizations should continue investing in digital technologies such as Artificial Intelligence (AI), Big Data Analytics, Cloud Computing, and automation to improve logistics efficiency.
- Real-time inventory management and intelligent demand forecasting should be strengthened to reduce stock shortages and improve order fulfillment.
- Companies should enhance route optimization systems to minimize delivery time and transportation costs.
- Customer-oriented digital services, including live order tracking, simplified mobile applications, and digital payment systems, should be continuously improved.
- Logistics managers should use customer feedback and data analytics to identify service gaps and enhance operational performance.
- Investment in digital infrastructure will help organizations achieve higher customer satisfaction and long-term competitive advantage.

VII. CONCLUSION

Digital transformation has fundamentally changed logistics and supply chain management by enabling organizations to improve operational efficiency, enhance service quality, and respond more effectively to changing customer expectations. Technologies such as Artificial Intelligence, Internet of Things, Big Data Analytics, Cloud Computing, and automation have become essential components of modern logistics systems.

The findings of this study demonstrate that Blinkit's adoption of digital technologies has positively influenced logistics and supply chain performance. Customers reported favorable perceptions regarding the ease of using the Blinkit application, delivery efficiency, and real-time order tracking. Furthermore, the positive correlation between digital transformation and customer satisfaction indicates that technology-driven logistics significantly enhances the customer experience.

The Chi-Square analysis further revealed that customer satisfaction does not differ significantly across age groups, suggesting that Blinkit's digital services effectively meet the expectations of a diverse customer base.

Overall, the study concludes that digital transformation is a key driver of operational excellence, supply chain efficiency, and customer satisfaction in the quick-commerce industry.

Organizations that continue investing in digital innovation are likely to achieve sustainable competitive advantages in an increasingly competitive marketplace.

VIII. LIMITATIONS OF THE STUDY

Although the study provides valuable insights, several limitations should be acknowledged.

- The study was limited to 200 Blinkit customers in Karnataka.
- Convenience sampling was adopted, which may restrict the generalization of the findings.
- The research focused exclusively on Blinkit and did not compare other quick-commerce platforms.
- Customer perceptions were measured during a specific period and may change over time as technology and market conditions evolve.
- The study primarily examined customer perspectives and did not include operational data from the organization.

IX. FUTURE SCOPE

The present study provides several opportunities for future research.

- Future studies may compare Blinkit with other quick-commerce companies such as Zepto, Instamart, or BigBasket.
- Researchers can examine the impact of specific digital technologies, including Artificial Intelligence, Blockchain, and IoT, on logistics performance.
- Larger sample sizes covering multiple states or regions of India can improve the generalizability of the findings.
- Future research may include logistics managers, delivery partners, and warehouse employees to gain a broader understanding of digital transformation.
- Longitudinal studies can assess how digital transformation influences logistics performance and customer satisfaction over time.

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