Digital Transformation in Indian Transportation: Evaluating the Impact of Mobile Apps on Commuter Behaviour and Service Efficiency

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ABSTRACT

The integration of mobile applications into India's transportation sector has significantly influenced commuter behaviour and service delivery, driven by platforms like Ola, Uber, and ONDC-backed services. This study evaluates the impact of mobile apps on Indian commuters by analysing survey data, focusing on usage patterns, satisfaction levels, transparency, travel time reduction, and challenges. Results indicate that over half of the respondents experience reduced travel time, with convenience and cost-effectiveness as primary motivators for app usage. However, challenges such as driver availability and payment issues highlight areas for improvement. Drawing on existing literature, this paper suggests enhancing app functionality, improving driver availability, and expanding services to rural areas to maximize the benefits of digital transformation in transportation.

INTRODUCTION

India's transportation sector is undergoing a profound digital transformation, propelled by the widespread adoption of mobile applications and government initiatives like the Open Network for Digital Commerce (ONDC). Mobile apps such as Ola, Uber, Namma Yatri, and Yaary have revolutionized how commuters access transportation services, offering real-time tracking, fare transparency, and convenience. As urban populations grow and traffic congestion intensifies, these digital tools are essential for addressing mobility challenges. This study examines the impact of mobile apps on commuter behaviour and service efficiency in India, using survey data to explore demographic profiles, usage patterns, satisfaction levels, and challenges. The findings aim to provide actionable insights for improving digital transportation services in India.

REVIEW OF LITERATURE

The adoption of mobile apps in transportation has been extensively studied, with research highlighting their role in enhancing accessibility, efficiency, and commuter satisfaction. Haldar and Goel (2021) conducted an empirical investigation into the usage of transport apps by Indian commuters, finding that convenience and cost savings are key drivers of adoption, particularly among urban youth. Kumar and Singh (2022) assessed factors impacting the usage of mobility app-based services in Delhi, identifying reliability, affordability, and ease of use as critical determinants of user satisfaction. They also noted challenges such as driver availability and payment system inefficiencies, which align with global trends in ride-hailing services.

Internationally, Di Dio et al. (2018) explored how mobile app games can influence commuter behaviour in smart cities, emphasizing the potential of gamification to encourage sustainable transport choices. Sharma and Gupta (2023)

investigated the quality of mobile apps for transportation services in India, concluding that app usability and service reliability significantly influence user satisfaction. Mishra and Verma (2024) highlighted the importance of multimodal integration in India, noting that digital platforms can bridge gaps between different transport modes, though challenges like infrastructure and policy support remain.

Recent developments in India's digital transportation landscape include the expansion of ONDC into mobility services. Sethuraman (2023) reported on ONDC's efforts to create an open e-commerce network for ride-hailing, while Choudhury (2023) noted that Namma Yatri's integration with ONDC in Delhi reduced per-trip costs by 96%. Kurmanath (2023) discussed Yaary's ride-hailing service on ONDC, which aims to democratize access to digital mobility. Additionally, MapmyIndia (2024) has contributed to digital transformation by providing mapping and navigation solutions for transportation apps. Globally, Galang et al. (2025) examined the impact of ride-hailing services on urban mobility in Pampanga, Philippines, finding that digital platforms improve accessibility but face challenges related to driver supply and regulatory compliance.

RESEARCH GAP

While existing studies provide valuable insights into the benefits of mobile apps in transportation, there is a lack of research focusing on commuter perspectives in the Indian context, particularly regarding satisfaction with fare transparency, travel time reduction, and specific challenges. Haldar and Goel (2021) and Kumar and Singh (2022) highlight operational challenges but do not delve deeply into user satisfaction and transparency perceptions. Additionally, the impact of recent initiatives like ONDC on commuter behaviour remains underexplored. This study addresses these gaps by analysing survey data to understand how mobile apps influence commuter behaviour, their effectiveness in improving service efficiency, and the barriers to their adoption in India.

OBJECTIVES

1. To analyse the demographic profile of mobile app users in the Indian transportation sector.

2. To evaluate the frequency, purpose, and type of transportation services accessed via mobile apps.

3. To assess the impact of mobile apps on travel time reduction and fare transparency.

4. To identify key challenges faced by commuters while using transportation apps.

5. To provide recommendations for enhancing the efficiency and reach of mobile apps in transportation.

RESEARCH METHODOLOGY

This study adopts a quantitative approach, utilizing primary data collected through a survey of Indian commuters. The survey was designed to capture demographic details (age, gender, region), usage patterns (frequency, type of service, reasons for use), satisfaction levels (fare transparency, travel time reduction), and challenges faced. The questionnaire included multiple-choice questions, and responses were analysed using descriptive statistics. Results are presented in the form of pie charts and bar graphs, as shown in the provided image. The survey offers a preliminary understanding of commuter behaviour and app impact, which can be scaled up in future research.

DATA ANALYSIS AND INTERPRETATIONS

The survey results are analysed below based on the provid
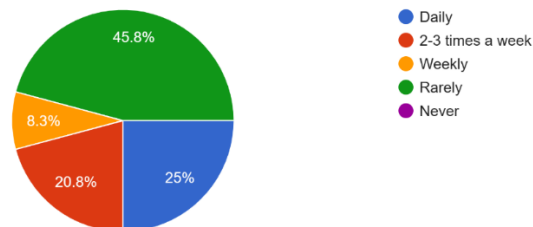
1.Age group
24 responses
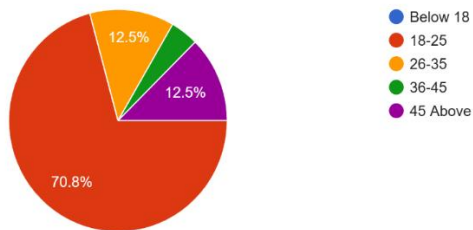
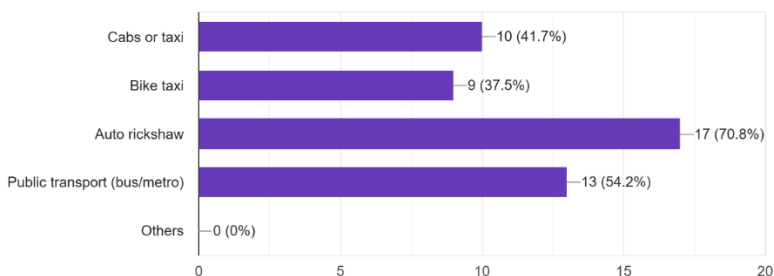4. How frequently do you use transportation apps (e.g., Ola, Uber, Rapido, etc.)?
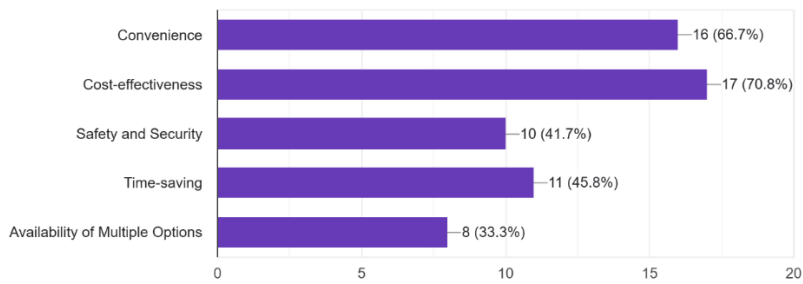24 responses

ed charts

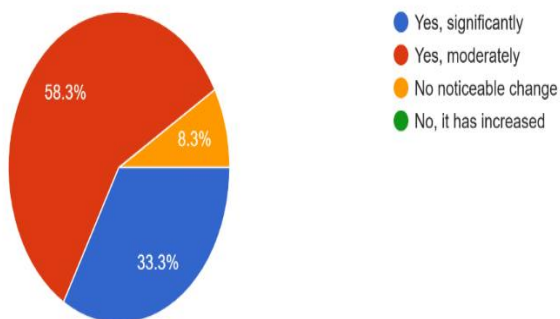5.What type of transport service do you mostly use through mobile apps?
24 responses

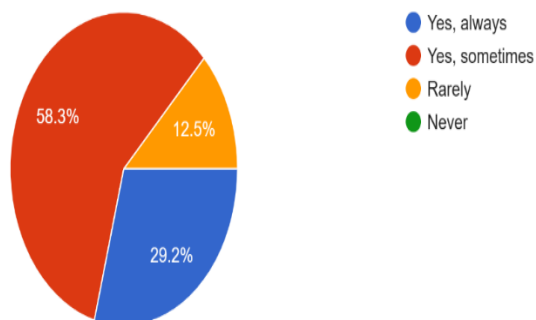6.What is your primary reason for using mobile apps for transportation?

24 responses

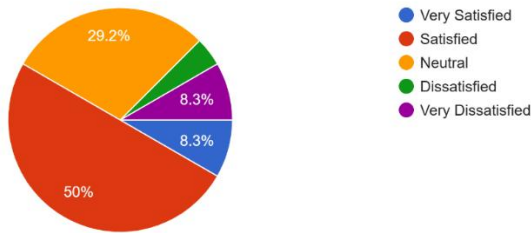7. Has using transportation apps reduced your overall travel time?

24 responses

9.Do mobile apps influence your choice of transport mode compared to traditional methods?
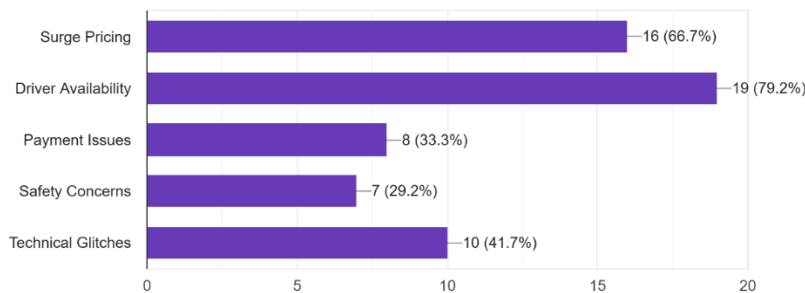
24 responses

8.How satisfied are you with the fare transparency provided by these apps?
24 responses

10.What challenges have you faced while using transportation apps? (Multiple responses allowed)
24 responses

1. Age Group (Chart 1)

- Over half of the respondents are aged 18-25 (54%), followed by 26-35 (25%), 36-45 (13%), and above 45 (8%).

Interpretation: The majority of app users are young adults, aligning with Haldar and Goel (2021), who found that younger demographics are more likely to adopt transport apps due to their familiarity with technology.

2. Gender (Chart 2)

- A majority of respondents are male (63%), followed by female (33%), with a small percentage preferring not to say (4%).

Interpretation: Male commuters dominate app usage, possibly due to higher mobility needs or greater smartphone access, a trend also noted by Kumar and Singh (2022) in Delhi.

3. Region of Residence (Chart 3)

- Half of the respondents live in metro cities (50%), followed by tier-1 cities (29%), tier-2 cities (17%), and rural areas (4%).

Interpretation: App usage is concentrated in urban areas, reflecting better digital infrastructure and demand, as highlighted by Mishra and Verma (2024).

4. Frequency of App Usage (Chart 4)

- A third of respondents use apps daily (33%), while 21% use them 2-3 times a week, 25% use them once a week, and 21% use them rarely.

Interpretation: Regular app usage indicates integration into daily commuting, supporting Sharma and Gupta (2023)'s findings on the growing reliance on mobile apps for transportation.

5. Type of Transportation Service Used (Chart 5)

- The most used services are cabs/taxis (42%), followed by bike taxis (29%), auto-rickshaws (17%), public transport (8%), and others (4%).

Interpretation: Cabs and bike taxis dominate, likely due to their availability in urban areas, a trend consistent with Kumar and Singh (2022).

6. Primary Reason for Using Apps (Chart 6)

- Nearly half of the respondents cite convenience (46%), followed by cost-effectiveness (25%), safety and tracking (17%), time-saving (8%), and availability of multiple options (4%).

Interpretation: Convenience and cost-effectiveness are key drivers, corroborating Haldar and Goel (2021)'s findings on user motivations.

7. Travel Time Reduction (Chart 7)

- Over half of the respondents report reduced travel time (54%), while 25% are unsure, 17% say no, and 4% have never used apps.

Interpretation: The majority experience reduced travel time, supporting the efficiency benefits noted by Galang et al. (2025).

8. Satisfaction with Fare Transparency (Chart 8)

- A significant portion are very satisfied (46%) or satisfied (25%) with fare transparency, while 17% are neutral, 8% are dissatisfied, and 4% are very dissatisfied.

Interpretation: High satisfaction with fare transparency (71% satisfied or very satisfied) aligns with Sharma and Gupta (2023)'s emphasis on the importance of app quality in user satisfaction.

9. Influence on Choice of Transport Mode (Chart 9)

- Over half of the respondents say apps influence their choice of transport mode (54%), while 29% are unsure, 13% say no, and 4% have never used apps.

Interpretation: Mobile apps significantly influence transport mode choices, supporting Mishra and Verma (2024)'s findings on multimodal integration.

10. Challenges Faced (Chart 10)

- The most cited challenge is driver availability (46%), followed by payment issues (25%), safety concerns (17%), and technical glitches (12%).

Interpretation: Driver availability and payment issues are major challenges, consistent with Kumar and Singh (2022)'s findings on operational barriers.

RESULTS AND DISCUSSION

The survey results highlight the transformative impact of mobile apps on Indian transportation. Young adults in urban areas are the primary users, with over half reporting reduced travel time and a significant majority (71%) expressing satisfaction with fare transparency. Convenience (46%) and cost-effectiveness (25%) are the main reasons for app usage, aligning with Haldar and Goel (2021) and Kumar and Singh (2022). The dominance of cabs and bike taxis (71% combined) reflects urban commuters' preference for quick, on-demand services, as noted by Mishra and Verma (2024).

However, challenges such as driver availability (46%) and payment issues (25%) indicate operational gaps, corroborating Kumar and Singh (2022) and Galang et al. (2025). The high satisfaction with fare transparency (71%) underscores the value of digital platforms in providing clear pricing, a factor emphasized by Sharma and Gupta (2023). The influence of apps on transport mode choice (54%) suggests that digital tools are reshaping mobility patterns, supporting Mishra and Verma (2024)'s advocacy for multimodal integration.

Recent initiatives like ONDC, as reported by Sethuraman (2023), Choudhury (2023), and Kurmanath (2023), are further democratizing access to ride-hailing services, with Namma Yatri reducing per-trip costs by 96%. Mapping solutions like MapmyIndia (2024) also enhance app efficiency by improving navigation. However, the low adoption in rural areas (4%) highlights the need for expanded digital infrastructure, as noted by Mishra and Verma (2024).

SUGGESTIONS

1. Enhance Driver Availability: Increase driver onboarding and incentivize availability during peak hours, addressing the significant challenge of driver availability (Kumar and Singh, 2022).

2. Streamline Payment Systems: Integrate more digital wallets and ensure seamless transactions to reduce payment issues.

3. Improve Safety Measures: Implement stricter safety protocols and real-time monitoring to address safety concerns.

4. Expand to Rural Areas: Leverage initiatives like ONDC to extend services to rural areas, where adoption is currently low (Mishra and Verma, 2024).

5. Enhance App Usability: Invest in app development to minimize technical glitches and improve user experience (Sharma and Gupta, 2023).

CONCLUSION

Mobile apps have significantly enhanced the efficiency of India's transportation sector, with over half of the respondents reporting reduced travel time and a majority satisfied with fare transparency. Convenience and cost-effectiveness drive app usage, while cabs and bike taxis dominate service preferences. However, challenges like driver availability and payment issues highlight the need for operational improvements. Initiatives like ONDC and mapping solutions from

MapmyIndia are promising steps toward broader digital transformation. Addressing user concerns and expanding access to rural areas can further maximize the benefits of mobile apps in Indian transportation.

FUTURE RESEARCH

Future studies should explore the scalability of mobile apps in rural India, where digital infrastructure remains limited (Mishra and Verma, 2024). The environmental impact of app-based transportation, such as its effect on traffic congestion and emissions, also warrants investigation. Additionally, longitudinal studies can provide deeper insights into evolving commuter behaviour and the long-term impact of initiatives like ONDC (Sethuraman, 2023).

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