

ROLE OF TECHNOLOGY AND ARTIFICIAL INTELLIGENCE IN RETAIL INDUSTRY: AN EMPIRICAL STUDY OF RETAIL STORES IN CHANNAPATNA

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ABSTRACT

The integration of technology and Artificial Intelligence (AI) has significantly redefined the retail landscape by enhancing operational efficiency, improving customer experience, and enabling data-driven decision-making. Technologies such as digital billing systems, inventory management software, customer analytics, and automated marketing tools have transformed traditional retail operations into more streamlined and competitive business models. While large urban centres have witnessed rapid and widespread adoption of these technologies, the penetration and effective utilization of AI in Tier-3 cities remain relatively underexplored and uneven. This study aims to investigate the role, extent of adoption, benefits, and challenges associated with the use of technology and AI in retail stores located in Channapatna, a prominent Tier-3 town known for its traditional retail base. A mixed-method research design was adopted, combining quantitative data collected through structured questionnaires with qualitative insights obtained from personal interviews with retailers. The study covers a sample of 25 retail units, including both organized retail outlets and traditional toy shops, thereby providing a comprehensive perspective. The findings reveal a high adoption rate of foundational digital technologies such as billing systems and inventory management tools, indicating a strong shift toward digitalization. However, the adoption of advanced AI applications—such as predictive analytics, chatbots, and personalized recommendation systems—remains moderate. Although retailers acknowledge the strategic importance and long-term benefits of AI, challenges such as lack of technical expertise, limited awareness, system inefficiencies, and infrastructural constraints hinder its full-scale implementation. This study concludes that with appropriate training, increased awareness, improved digital infrastructure, and access to user-friendly AI solutions, retail businesses in Tier-3 markets can significantly enhance their operational efficiency, competitiveness, and overall business performance.

Keywords: Artificial Intelligence, Retail Industry, Technology, Digital Transformation, Tier-3 Cities, Customer Data Analytics, Business Performance

INTRODUCTION

Technology is like a stimulus which enhances the efficiency of any activity or process wherever it is applied in a suitable way. Its presence in business is way long back and the extent of advancement has been different in different areas. With the demand for new and unique products and increased and ever-changing customer expectations, the application of technology in Retail industry has become very essential. In retail industry, technology has been applied in sourcing of merchandise, warehousing, accounting, marketing, maintaining personnel and also in customer relationship management. Today, technology has become a vital part of the retail industry by improving efficiency, accuracy and customer experience. The Retail industry has been embracing Artificial intelligence too.

Artificial intelligence, is an advanced form of technology enabling the retailers to predict demand, personalize services and automate operations. Modern Retail ecosystems are driven by retail digitalization which are artificial intelligence (AI), augmented reality (AR), Internet of things (IoT) and data governance systems (Diale, 2025). AI-driven systems in retail analyse data, automate processes and provide more personalized and efficient experiences for both customers and retailers. They are applied across online and physical stores. Some applications of AI are: Personalized shopping experiences, Customer experience and virtual agents, Demand forecasting, Supply chain management, Fraud detection, loss prevention and security.

The integration of AI and associated technologies into the retail sector has the capacity to enhance both the customer experience and business operations. Some common benefits of AI are: Increased efficiency, Enhanced customer experience, Cost reduction, Data-driven decision making, Advanced demand forecasting, Price optimization and Enhanced customer behaviour analysis.

From automated billing systems to customer recommendation engines, technology has enhanced operational efficiency and customer experience. While large metropolitan cities having embraced these advancements rapidly, the adoption in Tier-3 cities like Channapatna remains an area of interest. This study explores how retail units in such regions are adapting to technological changes and the challenges they face.

OBJECTIVES

- To understand the role of technology and Artificial Intelligence in the retail industry.
- To analyse the extent of technology and AI adoption in retail stores in Channapatna
- To examine the benefits and challenges of implementing AI in Tier-3 cities like Channapatna
- To suggest practical strategies for improving the adoption of AI in retail stores

METHODOLOGY

The study employs a Mixed-Method approach, where the primary data is collected through questionnaires (Quantitative) and interviews (Qualitative). The sample size for the study is 25 retail units; with 15 organized retail units and the rest 10 units belonged to traditional toy shops. A convenience sampling method was used to collect the data through questionnaires. A personal interview with the managers and staffs of the units were also conducted for data collection. The collected data is analysed as follows.

DATA ANALYSIS & INTERPRETATION

Profile of Respondents

The study reveals that 48% of respondents are managers, 36% are owners, and 16% are employees. Additionally, 60% of respondents have more than five years of experience, indicating a knowledgeable sample base.

ADOPTION OF TECHNOLOGY

A significant majority (92%) of retail units use digital billing systems and inventory management software. This indicates strong penetration of basic digital infrastructure even in smaller towns. This widespread adoption highlights the growing awareness among retailers regarding the importance of efficiency, accuracy, and record-keeping.

Interestingly, even traditional toy shops have begun adopting digital tools, indicating that technological penetration is not limited to organized retail formats.

Use of AI and Automated Systems

The findings show that:

- 72% use AI for customer recommendations, sales prediction, and stock management
- 68% use automated billing and digital marketing tools and
- Only 40% use chatbots

This suggests that AI adoption is focused more on operational efficiency than customer interaction technologies, possibly due to ease of implementation and immediate tangible benefits.

Frequency of AI Usage

About 88% of respondents reported using AI tools daily, demonstrating integration into routine business activities.

Customer Data Collection and Usage

- 96% of retailers collect customer data
- 100% collect phone numbers
- 72% collect feedback

However, the usage is mainly limited to sending promotional offers (92%), with fewer retailers using it for analytics or decision-making.

Impact of Technology on Business Performance

A majority (88%) of respondents reported significant improvement in business performance due to technology adoption. Key benefits include:

- Faster billing (84%)
- Better stock control (60%)
- Increased sales (52%)

Challenges in Technology Adoption

The major challenges identified include:

- Difficulty in understanding technology (32%)
- Technical issues (28%)
- Dependence on internet (28%)

Despite these challenges, most respondents rated them as moderate or low in severity.

Qualitative Insights

The open-ended responses highlighted several important perceptions:

- AI is essential for large retail chains
- Technology improves accuracy and efficiency
- It reduces costs and increases sales

- Customer understanding improves with data usage
- Continuous technological updates are necessary

These insights reflect a positive attitude toward AI adoption among retailers.

FINDINGS

From the above analysis, we find there is high penetration of digital technologies in retail operations, moderate adoption of AI tools, mainly for operational purposes, extensive collection of customer data with limited analytical usage, significant improvement in efficiency and business performance. Also found that the challenges are primarily related to lack of technical knowledge and system issues but still there is presence of positive perception and readiness toward future AI adoption.

DISCUSSION

The present study provides important insights into the evolving role of technology and Artificial Intelligence (AI) in retail units in Channapatna. The findings suggest that retailers in this Tier-3 city are actively transitioning toward digitalization, particularly through the adoption of foundational technologies such as digital billing systems and inventory management software. This reflects a broader shift in the retail sector where even small and traditional businesses are recognizing the necessity of technological integration for improving efficiency and maintaining competitiveness.

However, the study also reveals a noticeable gap between the adoption of basic technologies and the utilization of advanced AI tools. While a majority of retailers have implemented systems that support routine operations, the use of more sophisticated AI applications—such as predictive analytics, chatbots, and personalized recommendation engines—remains limited. This indicates that retailers tend to prioritize technologies that provide immediate and tangible operational benefits, while more complex, strategic applications of AI are yet to be fully explored.

Another critical aspect highlighted in the study is the widespread collection of customer data across retail units. Most retailers gather basic information such as phone numbers, feedback, and purchase history, demonstrating an awareness of the importance of customer data in modern retailing. However, the discussion points toward a significant gap in the effective utilization of this data. Instead of leveraging it for advanced analytics, customer segmentation, or predictive decision-making, retailers predominantly use it for basic promotional activities such as sending offers and discounts. This suggests that while data availability is high, the capability to convert this data into actionable insights remains underdeveloped.

The study further indicates that the challenges faced by retailers in adopting AI are primarily related to **skills and knowledge limitations** rather than financial constraints. Respondents reported difficulties in understanding and operating technological systems, along with issues such as technical errors and dependence on internet connectivity. The relatively low concern regarding cost and data security implies that affordability is not the primary barrier. Instead, the lack of training, digital literacy, and technical support appears to be the key factor restricting deeper adoption of AI technologies.

From a broader perspective, these observations suggest that the retail sector in Channapatna is in a **transitional phase of digital transformation**. While the foundation for technology adoption is well established, the progression toward advanced AI integration requires further support. The discussion highlights the importance of capacity-building initiatives, such as

training programs and awareness campaigns, to enhance retailers' understanding and confidence in using AI tools.

Moreover, improving access to user-friendly and scalable AI solutions can encourage retailers to move beyond basic applications and explore more strategic uses of technology. Strengthening digital infrastructure, particularly reliable internet connectivity, will also play a crucial role in facilitating seamless adoption.

In essence, the discussion underscores that the future growth of retail in Tier-3 cities like Channapatna will depend not only on access to technology but also on the ability of retailers to effectively understand, adopt, and utilize these technologies in a meaningful way. Bridging the gap between basic usage and advanced application will be key to unlocking the full potential of Artificial Intelligence in the retail sector.

RECOMMENDATIONS

To enhance the adoption of technology and Artificial Intelligence in retail, it is essential to focus on capacity building and supportive infrastructure. Training and skill development programs should be organized to equip retailers with the necessary knowledge to effectively use digital and AI tools. At the same time, providing affordable and user-friendly AI solutions can encourage wider adoption, especially among small and traditional retailers. There is also a need to promote data-driven decision-making practices so that retailers can utilize the customer data they collect more effectively. Improving digital infrastructure, particularly reliable internet connectivity, will further support seamless technology usage. Additionally, creating awareness about advanced AI applications can motivate retailers to move beyond basic technologies and explore more strategic and innovative uses of AI in their business operations.

CONCLUSION

The study concludes that retail stores in Channapatna are progressively embracing technology and AI despite being located in a Tier-3 city. The high adoption of basic digital tools reflects a strong foundation for further technological advancement. However, the limited use of advanced AI applications and data analytics highlights the need for capacity building and infrastructural support.

With the right strategies and support mechanisms, AI can play a transformative role in enhancing the competitiveness, efficiency, and sustainability of retail businesses in smaller towns.

REFERENCES

1. Kotler, P., & Keller, K. L. (2016). *Marketing Management*. Pearson
2. Laudon, K. C., & Laudon, J. P. (2020). *Management Information Systems*. Pearson
3. Deloitte (2023). *Global Retail Industry Outlook*
4. McKinsey & Company (2022). *The State of AI in Retail*
5. Government of India Reports on Digital Economy
6. Primary Survey Data in Channapatna(2026)