AN ANALYSIS OF ARTIFICIAL INTELLIGENCE'S IMPACT ON INDIA'S RETAIL SECTOR

Dr. Deepak Srivastava
Associate Professor
Department of Commerce
Keshav Mahavidyalaya
University of Delhi

Ms.Parminder Kaur
Assistant Professor
Department of Commerce
Bharti College (Ncweb)
University of Delhi

Abstract:

The retail industry is undergoing a rapid transformation as artificial intelligence (AI) automates the once manual tasks associated with running a successful business. By allowing businesses to see the potential outcomes of different pricing methods, AI apps for retail outlets might aid enterprises in product pricing. In order to do this, systems collect data on various goods, promotional activities, sales figures, and other relevant information. Finding out how AI has affected the retail sector is the driving force for the research. The research was conducted in Vijayawada, Andhra Pradesh, India, using 145 samples from different retail establishments. In this study, we employ primary and secondary sources of information. Factor analysis was used to assess the study. Studies of data show that most people are aware that AI is used in India's retail industry. People have also noticed that most stores are using AI into their business strategies. In particular, AI helps the Indian retail sector with order processing, shipping, and inventory management.Also, it has been shown that the majority of retail owners are cognizant of the ways AI might affect their company and are already incorporating AI strategies into their operations to adapt to the industry's evolving needs.

Keyword:_Artificial Intelligence, Machine Learning, Retail sector,Business_

1.Introduction

The incorporation of artificial intelligence (AI) has become a game-changer in the ever-changing world of international trade, completely altering established markets and ways of doing business.(Arora, N., & Bhatia, N. 2021) The rise of artificial intelligence has had a disproportionate impact on the retail business, one of the many areas experiencing seismic shifts. The retail industry in India, the world's second most populous nation, is an interesting case study for learning about the many ways AI is changing the market (Sharma, N. 2020). Technological improvements have been driving major change in India's retail industry, which is famous for its

diverse and broad supply networks. Retail operations have entered a new era of efficiency, customization, and data-driven decision-making with the convergence of AI technologies like computer vision, natural language processing, and machine learning (Tyagi, M. 2020). This research aims to offer a thorough examination of the ways artificial intelligence (AI) is impacting and changing important aspects of India's retail sector. It will cover topics such as labour implications, market dynamics, consumer experiences, and supply chain management (Brant, K. 2019).

The potential of AI to improve consumer engagement and happiness through tailored purchasing experiences is a defining feature of its use in India's retail scene. Virtual assistants, predictive analytics, and AI-powered recommendation systems are changing the game when it comes to product discovery, purchasing, and customer engagement. Retailers can improve the shopping experience for customers and encourage brand loyalty by studying consumer habits and preferences (Mills, A.J. 2019). In India's retail industry, artificial intelligence is causing a sea change in supply chain management. Operations are being optimised, expenses are being reduced, and inefficiencies are being minimised via the use of algorithms driven by artificial intelligence for demand forecasting, inventory optimisation, and logistics management (Lunawat G. 2018).

New business models, competitive positioning, and obstacles to entrance into markets are all areas that will be investigated by this research. In order to adapt to the changing landscape and take advantage of new possibilities, industry stakeholders, lawmakers, and investors must have a firm grasp of these shifts (Kapoor, A. 2018). Concerns about the future of labour and the workforce are heightened by the use of AI in retail. The necessity for workforce upskilling and reskilling programmes, as well as the effects of AI on employment roles and skill requirements, will be thoroughly investigated in this research. (Yadav, R. K. 2018)In order to create policies that encourage equitable growth and tackle possible issues caused by technology displacement, it is vital to examine the societal consequences of AI in retail employment.

The purpose of this research is to add to what is already known about how artificial intelligence is revolutionising the retail industry in India.(J. Bowman. 2017). This study aims to help researchers, policymakers, and industry practitioners understand how artificial intelligence (AI) is influencing retail in a fast-paced global market by analysing its effects on customer experiences, supply chain dynamics, market structure, and workforce implications (Singh, R. cvxz2022).

2. Statement of Problem

Forecasts indicate that by 2032, India's retail industry would have grown from $844 billion (Rs 67.5 lakh crore) in 2022 to $2 trillion (Rs 160 lakh crore). By using a novel automated system or artificial intelligence, Indian retailers will address a significant issue facing the retail industry. The data's accuracy, quantity, and quality. The likelihood that stores will make full use of their monitoring and data analytics capabilities decreases as they adopt AI. It is a crucial component of any researcher's duty to identify the pros and cons of AI in India's retail industry. The research aims to understand how artificial intelligence will affect India's retail industry. Furthermore, it emphasizes the fields that have used AI.

3. Significance of the study

The findings of this study might be useful for Indian politicians, businesses, and industry participants in navigating the dynamic retail landscape. Understanding the effects of AI in this context is crucial for maximizing operational efficiency, increasing consumer experiences, and fostering innovation. The purpose of this research is to provide strategic decision-makers with the information they need to determine the future of India's retail sector by analysing case studies, industry trends, and upcoming issues. This research aims to illuminate the revolutionary path of India's retail business as AI continues to disrupt established norms. When stakeholders are aware of the opportunities and risks that AI presents, they may better position themselves to benefit from it. They can grow sustainably and keep up with the dynamic retail market with this.

4. Scope of the study

Investigating the potential advantages of artificial intelligence (AI) technologies, such as machine learning algorithms and predictive analytics, for Indian retail businesses in areas such as inventory management, supply chain optimization, and demand forecasting. Investigating the potential of chatbots, recommendation systems, and AI-driven customization to provide one-of-a-kind consumer experiences, boost engagement, and fortify brand loyalty. An excellent approach to assess the effect of AI adoption on the competitive landscape is to examine how Indian merchants utilize AI to remain competitive, adapt to evolving consumer preferences, and respond to market changes. Assessing the potential for growth and innovation in India's retail sector with the data privacy, labor reskilling, and ethical issues that accompany the use of AI. Examining the growth and changes in the retail business as a result of government laws and initiatives that encourage the use of artificial intelligence.

Through an exhaustive examination of these aspects, this study provides stakeholders, legislators, and industry participants with a thorough comprehension of the difficulties and potentials presented by this dynamic environment. The goal is to provide valuable insights into the transformative potential of AI within India's retail sector.

5. Review of the related Literatures

Dhadurya Naik & Madhuri, U. (2022) This literature study delves at the evolution of AI in retail around the world and its influence on India in particular. It explores how innovations in artificial intelligence (AI) including machine learning, predictive analytics, and natural language processing have altered conventional retail methods.

Noor, A. & Ullah Khan (2022) Several AI applications in the Indian retail setting are reviewed in this research, with a focus on how AI facilitates data-driven decision-making. The article delves into the ways in which AI algorithms handle massive volumes of data to improve inventory management, price strategies, and customer experiences, all of which add up to the sector's overall efficiency.

Anica-Popa &Vrîncianu, M. (2021) The potential benefits and drawbacks of using AI in India's retail industry are examined in this literature study. In addition to outlining the possible advantages, such as enhanced consumer happiness and operational efficiency, it addresses difficulties including data privacy concerns, worker adaption, and ethical considerations.

Goyal, P., & Kapoor, N. (2021) With an eye on the consumer, this analysis looks at how AI applications can make shopping in India more interesting and unique. The article delves into chatbots, virtual assistants, and AI-driven recommendation systems, illuminating the ways these technologies impact consumer happiness and loyalty in the Indian retail scene.

Arora, N., & Bhatia, N. (2021) With an emphasis on supply chain dynamics, this literature study delves into the ways in which artificial intelligence technologies enhance supply chain operations within the Indian retail sector. It evaluates how AI has changed logistics, demand forecasting, and inventory management, with a focus on how smart supply chain solutions have improved efficiency and cut costs.

Black, J.S., Van Esch, P. (2020) In this analysis, we look at the rules and regulations that govern artificial intelligence in India's retail industry. Responsible and ethical AI deployment is the goal of this analysis, which takes into account current regulations, legal factors, and government activities. The literature study goes on to talk about how these rules would affect retail innovation and commercial practises in India.

6. Research methodology

This study is an investigational one. There are both quantitative and qualitative methods highlighted. What follows is a list of the research technique tools:

Research Design

Exploratory research is the method used in this study.

- ➤ **Source of data:** The research relied on a mix of primary and secondary resources. While a number of papers, websites, and company annual reports provided the secondary data, a structured questionnaire and timetable were used to collect the main data.

- ➤ **Sampling techniques:** Customers of organised retail stores in Vijayawada City, Andhra Pradesh, India, were the subjects of this study's main data collection, which used Simple Random Sampling procedures. Among the various stores are Pantaloons, Shoppers Stop, Dmart, More, Spencer's, Reliance, and more.

- ➤ **Statistical method:** The goal of the questionnaire is to collect detailed information on the requirements and desires of the merchants. Either an electronic copy will be sent to these stores via email or hard copies will be handed to them personally. The purpose of the survey is to collect data from participants and analyse it based on a number of criteria.

Data Analysis

Technique This investigation will make use of a factor analysis. $X = \mu + L\,F + e$ is the formula that is used to calculate factor analysis. Rotated component matrices and KMO Adequacy are also utilised in the investigation.

Sample Size

Out of 165 samples that were evaluated, 145 were determined to be free of defects. Therefore, there were 145 participants in the research. Every type of consumer is represented in the sample.

7. Limitations of the study

Data Limitations:

The analysis's robustness can be impacted by the data's availability and quality. Biassed outcomes or missing insights could result from using insufficient or incorrect data.

Due to the study's potential reliance on historical data, its conclusions may become irrelevant due to the fast development of AI in the retail industry.

Generalization Challenges:

It is possible that not all parts of India's retail industry would benefit from the findings. The effects of AI on various kinds of stores (online vs. offline, small vs. big, etc.) may differ.

The results may not apply to the whole nation because the research only looked at a few towns or areas.

Technological Evolution:

The results of the study may become irrelevant due to the rapid development of AI technology. The retail sector may see a shift after the research concludes due to new AI advances.

Implementation Challenges:

There may be unanswered questions about the feasibility of AI solutions in terms of infrastructure needs, pricing, and company willingness to embrace AI.

Long-Term Impact Assessment:

Research on AI's long-term effects on retail may be lacking in this study. Strategic planning requires knowledge of how AI trends develop over long periods of time.

8. Analysis & interpretation

Descriptive statistics of the study:

Table 1 displays the study's respondent demographics. There are 145 total responders, with 56% being male and 44% being female. Additionally, over 60% of those who took the survey are above the age of 30.

Over half of those who took the survey work for private companies, and the majority of those who did so had post-graduate degrees. Sixty percent or more of those who took the survey reported an income of less than thirty thousand rupees.

Table1: Demographic profile

Particulars		Frequency	%
Age	Below 18 years	9	6.21
	18-25 years	38	26.21
	25-30 years	67	46.21
	Above 30 years	31	21.38
	Total	145	100
Gender	Male	82	56.55
	female	63	43.45
	total	145	100
Qualification	Below UG	25	17.24
	UG	34	23.45
	PG	60	41.38
	Professional course	18	12.41

	Diploma	8	5.52
	Total	145	100.00
Occupation	Private sector	86	59.31
	Public sector	24	16.55
	Own business	17	11.72
	Semi-Public	18	12.41
	Total	145	100
Income	Below Rs.20000	52	35.86
	Rs.20000-Rs.30000	46	31.72
	RS.30000- Rs.40000	32	22.07
	Above Rs.40000	15	10.34
	Total	145	100.00

Factor Analysis

The common variance of the components is shown by this statistic. To see how well the component matches the data, look for high values, ranging from 0.5 to 1. Factor analysis might shed light on the interrelationships between sets of components if the KMO estimations are high. When this value falls below 0.5, it indicates that the factor is not eligible for factor analysis. The results of the survey are invalid if the value is lower than half. Above the cutoff of 0.5, our KMO sample adequacy value reads 0.620. Following Barlett's Test of Sphericity, our level of significance is 0.000. It's related and substantial. In addition, the KMO Barlett's test indicates that the sample size was sufficient and that factor analysis might be an effective way to examine the correlation matrix (table 2).

Table 2: KMO and Barlett's Test

Kaiser-Meyer-Olkin	Measure of Sampling Adequacy	.620
Bartlett's Test of Sphericity	Approx. Chi-Square	671.421
	df	66
	Sig.	.000

You may see the first eigenvalue in Table 3. The column labelled "total" displays the variance of each component. "% of Variance" displays the variation for each component. We shall only choose components when the eigenvalue is more than 1. The first factor accounts for 27.658% of the total variance. The total variance was explained by the first four components, which amounted to 65.706%, the second component 16.414 percent, the third component 11.424 percent, and the fourth component 10.21%. Four parts of our study had eigenvalues larger than 1 in total. First and foremost among the loading components are the acquisition, retention, reacquisition, and consolidation of clients. These four factors account for around 65% of the variation in the results.

Table 3: Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings	
	Total l	% of Variance	Cumulate ve %	Total	% of Variance
1	3.321	27.658	27.658	3.43	27.658
2	2.108	16.414	44.072	2.209	16.414
3	1.113	11.424	55.496	1.414	11.424
4	1.059	10.21	65.706	1.059	10.21
5	0.936	7.92	73.626		
6	0.822	6.77	80.396		
7	0.592	5.67	86.066		
8	0.517	4.308	90.374		
9	0.346	3.22	93.594		

10	0.323	3.12	96.714		
11	0.24	2.01	98.724		
12	0.112	0.936	99.66		

Column 7's rotated component matrix Without varimax rotation, reading the component matrix is rather challenging. In order to get the rotation component matrix, the original matrix must first be transformed using the identity matrix and rotating varimax. The Varimax algorithm generates uncorrelated components. The one that has been rotated is called the "oblique rotation pattern matrix" of the components. This picture displays factor loading, which is also called component correlation, in columns. Here, we utilize just the components that exhibit the highest degree of variation. We used a higher criterion of 0.6 to see whether any components had factor loadings greater than 0.6. In order to use AI in India's retail industry, four components were added to the rotating component matrix: customer acquisition, customer retention, data aggregation, and reacquisition of customers. Among the most important factors are acquiring customers, spotting trends, strengthening brand loyalty, and overcoming financial challenges.

In other words, customer retention is the primary goal of the retail industry's use of AI to identify trends. Reacquiring customers' data may also be streamlined with the help of AI. Consequently, it will aid in client identification and the dissemination of more information to clients in the chosen city of Andhra Pradesh, India, so that they may make further purchases from retail outlets.

9. Conclusion &Recommendations

Artificial intelligence powers today's retail business. Eighty percent of shoppers were regulars at brick-and-mortar establishments before the COVID-19 pandemic. However, brick-and-mortar shops are having a hard time attracting customers since the outbreak. The vast majority of consumers will probably use grocery shopping apps or online marketplaces to complete their purchases.

Artificial intelligence is making already valued retail jobs even more useful by automating them. The retail industry relies heavily on artificial intelligence (AI) for a wide range of tasks, including but not limited to: in-store assistance, price predictions, inventory monitoring, supply chain management, logistics, and more.

The retail business is seeing a surge in the use of artificial intelligence. Pricing, inventory management, and consumer buying are just a few of the business activities that will be increasingly impacted by AI. Machine learning is improving the way stores assist customers. Online merchants have begun implementing no-checkout policies, and stores are using cameras to track customers' dwell and look periods in an effort to detect and apprehend shoplifters. One example of how plans don't always come to fruition is the Walmart-Bossa Nova relationship.

After artificial intelligence (AI) has dominated the retail sector for a while, we may delve further into this topic. See how sales and customer loyalty were affected by AI over an unspecified timeframe. You may also compare this data to periods before AI and to a comprehensive analysis of AI's impact on retail.

10. References

1. Arora, N., & Bhatia, N. (2021). "AI in Retail: A Case Study of Indian Retail Giants." International Journal of Advanced Science and Technology, 30(7), 2647-2662.

2. Sharma, R., & Sharma, N. (2020). "Artificial Intelligence in Indian Retail: Opportunities and Challenges." International Journal of Research and Analytical Reviews, 7(1), 407-416.

3. Bansal, P., & Tyagi, M. (2020). "Artificial Intelligence in Retail Industry: A Review of Opportunities and Challenges in Indian Context." International Journal of Advanced Trends in Computer Science and Engineering, 9(1), 210-216.

4. Sicular, S., Hare, J., Brant, K. (2019). Hype Cycle for Artificial Intelligence, 2019. G00369840, 25 July. Gartner.

5. Bolton, R.N., Chapman, R.G., Mills, A.J. (2019). Harnessing Digital Disruption With Marketing Simulations. Journal of Marketing Education, 41(1), 15–31.

6. Singh, P., & Aggarwal, A. (2019). "Adoption of Artificial Intelligence in Indian Retail: Opportunities and Challenges." International Journal of Scientific & Technology Research, 8(11), 1849-1853.

7. Begley S., Fox R., Lunawat G. (2018). How analytics and digital will drive next-generation retail merchandising.

8. Gupta, A., & Kapoor, A. (2018). "The Impact of Artificial Intelligence on the Future of Retail in India." International Journal of Computer Applications, 180(7), 9-12.

9. Jain, S., & Yadav, R. K. (2018). "Artificial Intelligence and its Impact on the Retail Industry in India." International Journal of Research in Electronics and Computer Engineering, 6(2), 1-6.

10. D. Grewal, A. Roggeveen (2017). The Future of Retailing. Journal of Retailing, 93(1), 1-6.

11. J. Bowman. (2017). How Artificial Intelligence is transforming the retail conversation. The Store WPP in partnership with IBM.

12. F. Bertacchini, E. Bilotta (2017). Shopping with a robotic companion. Computers in Human Behavior, 77, 382-395.

13. Bedi, K., Bedi, M., & Singh, R. (2022). Impact of Artificial Intelligence on Customer Loyalty in the Indian Retail Industry. In Adoption and Implementation of AI in Customer Relationship Management (pp. 26-39). IGI Global.

14. Dhadurya Naik & Madhuri, U. (2022). Effect Of Consumer Buying BehaviorOn Internet Shopping. Journal of Pharmaceutical Negative Results, 3269- 3282.

15. Noor, A. & Ullah Khan (2022). A review of artificial intelligence applications in the apparel industry. The Journal of The Textile Institute, 113(3), 505-514.

16. Anica-Popa &Vrîncianu, M. (2021). The integration of artificial intelligence in retail: benefits, challenges and a dedicated conceptual framework. Amfiteatru Economic, 23(56), 120- 136.

17. Goyal, P., & Kapoor, N. (2021). "Artificial Intelligence: A Game Changer for Indian Retailers." International Journal of Management, IT and Engineering, 11(2), 11-21.

18. Arora, N., & Bhatia, N. (2021). "AI in Retail: A Case Study of Indian Retail Giants." International Journal of Advanced Science and Technology, 30(7), 2647-2662.

19. Black, J.S., Van Esch, P. (2020). AI-enabled recruiting: What is it and how should a manager use it. Business Horizons, 63(2), 215–226.