



AI in Digital Marketing and Consumer Analytics: Fostering Sustainable Marketing and Customer Experience within the Indian FinTech Sector

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Abstract

This paper offers a systematic examination of the nexus between artificial intelligence (AI), sustainable marketing, and customer experience in the Indian FinTech industry. Based on a thematic content analysis of secondary data sources, this research determines the multifaceted uses of AI in digital marketing, such as hyper-personalisation, intelligent automation, and fraud detection. The results indicate a critical, two-pronged effect: AI improves customer experience through unparalleled efficiency and personalisation while, at the same time, posing ethical and psychological issues, such as the "trust paradox" and the risk of a "faceless system." In addition, the study examines how AI can promote sustainable practices by maximising resource efficiency and facilitating green finance, in spite of the inherent environmental costs of AI production. The paper concludes by offering evidence-based suggestions for practitioners and policymakers and emphasises the pivotal role of India's changing regulatory environment, as represented by the Reserve Bank of India's (RBI) FREE-AI framework, in regulating this revolutionary technology.

Keywords: *Artificial Intelligence (AI), Digital Marketing, Consumer Analytics, Indian FinTech, Customer Experience (CX), Sustainable Marketing, Responsible AI, Financial Risk Analytics*

Introduction

The Indian economy is experiencing a deep digital revolution, driven by a strong digital

public infrastructure (DPI) and a thriving FinTech ecosystem. The FinTech sector, with a valuation of over \$100 billion today, has



expanded at a staggering Compound Annual Growth Rate (CAGR) of 31% over the last decade and is expected to grow to \$420 billion by 2029.¹ This growth is supported by India's enormous digital foundation, with over 1.38 billion Aadhaar holders and 821 million internet users, making it a pivotal and singular case for research on the influence of emerging technologies. The industry has also witnessed substantial financial services funding, reaching around \$4.8 billion in 2024, with a significant share going towards non-lending business models.

While the revolutionary influence of AI in digital marketing and customer experience (CX) is well-documented across the world, there is a large research gap that considers this comprehensively in the Indian FinTech context, particularly its interplay with emerging notions of sustainability and the distinctive regulatory landscape. The overarching challenge for the industry is to reconcile unprecedented growth and technological progress with ethical, responsible, and sustainable practices. This paper seeks to bridge this gap by undertaking a systematic examination of these interrelated areas.

Review of Literature

- Bhattacharya, A., Parakh, N. & Bhagat, S. (2022), Artificial Intelligence in Marketing: A Pathway to Customer-Centric Growth. Their empirical study highlighted how AI-driven personalisation improves targeting, campaign efficiency, and conversion in

digital marketing. Outcomes included higher click-through rates and improved customer segmentation

- Jain & Kumar (2021), AI Applications in Consumer Analytics and Risk Modelling, Applied NLP and machine learning to consumer analytics in financial services. Findings showed improved fraud detection, anomaly recognition, and sentiment analysis, providing stronger early warning signals.
- Singh & Gupta (2021), AI and Customer Experience in Indian Financial Services, A study on AI-enabled chatbots in financial services found reduced query response times, higher efficiency, and positive customer experience outcomes in the short term.
- Deloitte (2022), Responsible AI in Financial Services, Consulting study underscored the importance of transparency and fairness audits in AI systems for financial institutions.
- Gupta (2021), AI-Driven Consumer Risk Analysis in FinTech, discussed AI's role in consumer risk modelling in Indian FinTech. The study emphasised AI's predictive capabilities in credit scoring and behavioural analytics.
- Sharma (2020), Artificial Intelligence in Customer Support Systems, focused on customer service automation, reporting that AI tools streamlined operations and enhanced satisfaction levels in FinTech.



Research Gap

Several research areas highlight the role of Artificial Intelligence (AI) in digital marketing and consumer analytics worldwide. However, the literature in the Indian FinTech sector is still lagging behind, having multiple unaddressed concerns.

- **Limited sector-specific focus**

The greatest part of existing research deals with the use of AI in marketing generally or in the banking sector with few studies that focus specifically on the role of technology in the Indian FinTech firms. These are the factors that differentiate consumer expectations, regulatory frameworks, and digital adoption in the mentioned sector.

- **Sustainable marketing underexplored**

AI being the major contributor to the success of personalization and efficiency has been well documented. Still, there is minimal research on the direct contribution of AI to sustainable marketing practices, such as eco-conscious investments, financial inclusion, and reduction of digital waste.

- **Customer trust and data privacy concerns**

A number of studies have accentuated the plausible roles of chatbots, personalization, and predictive analytics. However, only a few of them talk about the trust paradox—the gap between consumers' desire for personalization and their lack of trust in how financial institutions manage sensitive data.

- **Fragmented view of customer experience (CX)**

In most of the existing works of literature, customer experience is commonly considered through operational efficiency. For example, the reduced query time, automated service, etc. Other factors like satisfaction, loyalty, emotional engagement, and long-term relationship building are often neglected in the holistic understanding of CX.

- **Implementation challenges in Indian context**

The practical issues related to infrastructure, scarcity of skilled AI professionals, and the fragmented data system which severely impacts Indian FinTech adoption have been left unaddressed due to lack of in-depth analysis in these areas.

- **Ethical and regulatory frameworks**

The main concerns have been the likes of algorithmic bias or consumer manipulation due to technology, however, not with standing, comprehensive research work that links Indian regulatory standards and consumer protection mechanisms with the risks caused by tech is hard to find.

- In summary, although AI is recognized as a catalyst for innovation in digital marketing and consumer analytics, there is a research gap in understanding how it can simultaneously enhance customer experience and drive sustainable marketing within the



Indian FinTech ecosystem, while balancing ethical, practical, and regulatory challenges.

Research Methodology

Problem Statement

The growing use of Artificial Intelligence (AI) in the Indian FinTech sector presents a complex and nuanced landscape, one filled with both exciting opportunities and significant challenges. While AI offers businesses innovative ways to enhance digital marketing and consumer analytics, its implementation is fraught with ethical and practical issues that must be addressed for responsible and sustainable growth. The financial services industry, which handles highly sensitive personal and financial data, is particularly vulnerable to these concerns. One of the most critical ethical issues is data privacy and security. AI models require massive amounts of data to be effective, which necessitates the collection and processing of consumer information on a large scale. This raises serious questions about how that data is protected from breaches and misuse, especially as regulations like the Digital Personal Data Protection Act evolve. Another major ethical hurdle is algorithmic bias. If not carefully managed, AI algorithms can learn and perpetuate existing social inequalities, for instance, by unfairly denying credit or loans to certain demographics. This lack of transparency and potential for discrimination can erode public trust. Furthermore, AI can be used to create "dark patterns," which are manipulative design tactics that trick users into making unintended choices, thereby

undermining consumer autonomy and limiting their options. Beyond these ethical dilemmas, the Indian FinTech sector also faces significant practical barriers. There is a notable shortage of skilled AI experts and data scientists, leading to intense competition for talent and high salaries, which can be prohibitive for many companies. Financial institutions also struggle with their outdated legacy systems, which are often fragmented and difficult to integrate with modern AI technologies. This makes the process of upgrading infrastructure and ensuring seamless connectivity a major technical and financial challenge. Ultimately, for AI to be a force for good in the Indian FinTech sector, it is essential to proactively address these ethical and practical issues. This requires a balanced approach that not only embraces AI's vast potential for innovation but also ensures its deployment is responsible, secure, and equitable for all stakeholders.

Objective of the Study

- To examine the disruptive innovations that AI brought about in digital marketing and consumer analytics in the Indian financial technology sector.
- To determine the influence of AI on customer service, delight, and loyalty when consumers interact with Indian financial technology platforms.
- To explore the issue of ethics in the Indian FinTech sector and evaluate the role of AI in transforming marketing for eco-friendly and sustainable practices in the area.



Limitations of the Study

- Findings are limited by the availability and quality of secondary data from published sources.
- The investigation focuses primarily on liquid, publicly traded securities, and may not fully extend to alternatives or private assets.
- Rapid evolution of technology may make some findings obsolete or require frequent revision.
- The scope does not include exhaustive quantitative benchmarking due to the descriptive analytical design.

Scope of the Study

- Analyses of AI solutions accessible to both institutional and retail investors.
- Coverage of main asset classes: equities, bonds, and to a lesser extent commodities.
- Exploration of AI applications in market surveillance, news analytics, anomaly detection, report generation, and simulation.
- Inclusion of case studies from developed and emerging markets to ensure broader relevance.

Research Design

Overview of Research Design

This study employs a descriptive-analytical design to explore and critically assess the integration and effectiveness of AI in real-time risk analytics for investment portfolios, with a

particular focus on the Indian financial market context. The research design provides a blueprint for systematically collecting, analysing, and synthesizing both qualitative and quantitative data from a variety of credible secondary sources.

Type of Study

- **Descriptive Analytical Study**

This approach is chosen to provide an in-depth understanding of the current landscape of AI-driven risk analytics. It does not involve experimental manipulation, but rather observes and interprets developments as they exist within the financial ecosystem.

- **Comparative Case Study Method**

The research incorporates multiple Indian case studies, comparing the impact and effectiveness of varied AI solutions across banks, brokerage firms, and asset management companies. These are juxtaposed against select global cases for benchmarking.

Data Sources

- **Academic Journals and Conference Papers**

Peer-reviewed articles and conference proceedings form the theoretical foundation, ensuring the reliability of information on AI methods, algorithms, and risk management frameworks.



- **Industry Whitepapers and Technical Reports**

Recent publications by consultancy firms, market analytics providers, and AI solution vendors are analysed to understand real-world applications and success stories within the Indian context.

- **Official Documentation**

User manuals, technical specifications, and public disclosures from Indian financial institutions and fintech firms deploying AI-powered tools contribute detailed operational and compliance insights.

- **Regulatory Circulars and Reports**

Published materials by the Securities and Exchange Board of India (SEBI), Reserve Bank of India (RBI), and other regulatory bodies inform understanding of legal, ethical, and procedural standards in AI-assisted risk management.

- **Media articles and Press Release**

Select media coverage, expert interviews, and press statements add perspectives on technological adoption trends, investor sentiment, and recent high-impact events in the Indian markets.

Data Collection Methods

- **Systematic Literature Review**

A structured approach is utilized to identify, filter, and review relevant publications from renowned databases (e.g., Scopus, Web of Science, SSRN) and institutional repositories, with a strong emphasis on the latest Indian research.

- **Content**

In-depth qualitative examination of secondary data sources is undertaken to extract themes, best practices, and emerging challenges related to AI-based risk analytics.

- **Comparative Analysis**

Findings from different institutions and case studies are systematically compared to identify context-specific differences, effectiveness of AI tools, and unique challenges faced in the Indian scenario.

Analytical Tools and Techniques

- **Thematic Analysis:** Key topics, issues, and trends are identified and organized to build a coherent narrative about AI's evolution in risk management.

- **Trend and Gap Mapping:** The study maps adoption trends, highlights technological and regulatory milestones, and identifies persistent challenges and research gaps.

- **Descriptive Statistics:** Where secondary quantitative data are available (e.g., adoption rates, detection accuracies, fraud reduction metrics), descriptive statistics are presented to reinforce qualitative insights.

Scope and Boundaries

- **Geographical Focus:** The primary focus is on Indian financial markets—publicly traded equities, bonds, and mutual funds—but benchmarks with



international developments are included for context.

- **Thematic Boundaries:** Themes include real-time risk monitoring, AI-driven news analytics, anomaly detection, risk reporting, and simulation-based stress testing.
- **Stakeholder Range:** The analysis incorporates perspectives from institutional investors, regulators, retail investors, and fintech providers to capture a holistic view of AI's impact.

Ethical Considerations

- **Data Transparency and Attribution:** All secondary sources are appropriately credited and critically evaluated for authenticity and relevance.
- **Bias:** Multiple perspectives and a variety of sources are integrated to maintain objectivity and reduce selection bias.
- **Confidentiality:** The study relies exclusively on publicly available information, ensuring corporate confidentiality is respected.

The research design for this study is built to provide a deep, yet broad, understanding of how AI is transforming risk analytics in Indian investment management. It begins with a rigorous literature review to create a strong theoretical foundation and identify gaps in current knowledge. This is followed by a dual approach of case and comparative analyses. The case studies offer an in-depth, granular look into specific firms, examining the technical and organizational changes required

to implement AI. This allows for a rich understanding of the "how" and "why" behind the transformations. The comparative analysis, on the other hand, provides breadth by systematically comparing different firms and market contexts. This helps to identify broader trends and best practices across the industry. Together, these methods ensure the research captures both the specific details of individual transformations and the wider, systemic changes affecting the entire sector, providing a truly comprehensive view.

Findings, Suggestions & Conclusion

Findings

- **Real-Time Monitoring of Investment Risks**

AI-driven platforms are fundamentally changing how the Indian financial sector manages risk. These systems continuously analyze immense volumes of real-time market data, including price fluctuations, trading volumes, and volatility indices. They go beyond simple monitoring by employing sophisticated machine learning algorithms to instantly interpret complex shifts and correlations within asset behaviours. This capability allows for the proactive identification of developing risks, such as sudden market downturns, unusual trading activities, or broader systemic shifts. As a result, investors receive timely alerts, which dramatically shortens their response window. This early detection enables both institutional and retail investors to take swift, protective actions. By providing



immediate insights into potential threats, AI-driven platforms empower investors to mitigate risks and prevent them from materializing into significant financial losses.

- **AI-Powered News Analytics and Prediction**

AI-driven platforms are transforming risk analytics in the Indian financial sector by using Natural Language Processing (NLP) to go beyond traditional structured data. These tools continuously analyze and interpret a diverse stream of unstructured, real-time information, including financial news, regulatory updates, social media signals, and economic releases. In the Indian context, these platforms are being specifically tailored to understand regional news sources and process multilingual content, significantly enhancing their relevance and timeliness. By correlating sentiment and narrative shifts in the news with portfolio exposures, AI models can issue early risk alerts even before conventional financial indicators show a change. This capability is particularly valuable during significant events like policy announcements or geopolitical disruptions, as it shortens the response window and empowers both institutional and retail investors to take proactive, protective measures before potential risks become actual losses.

- **Anomaly Detection in Portfolio Behaviour**

Machine learning systems are proving to be a game-changer in risk management by systematically analyzing historical and real-time data to identify hazardous patterns. These systems can recognize subtle signs of trouble, such as unexpected correlations between seemingly unrelated assets, the over-concentration of risk exposure in a particular sector, or a significant deviation from an asset's typical performance. In the Indian financial sector, fintech firms and banks are leveraging these capabilities to proactively identify critical risks. For example, they're using these systems to flag potential credit default risks in their loan portfolios, detect signs of impending liquidity crunches, and uncover fraudulent activities. This early detection capability allows institutions to take timely, protective actions and prevent minor issues from escalating into major financial losses that might have gone unnoticed with traditional methods.

- **Simplified and Transparent Risk Reporting**

AI-enhanced reporting is democratizing access to complex financial analytics by transforming intricate risk models into easily understandable formats. These solutions convert dense mathematical data into user-friendly summaries, interactive dashboards, and simple, plain-language explanations. The goal is to make sophisticated risk information



accessible to a wider audience, including non-expert investors and corporate decision-makers. For example, financial service providers in India are now regularly distributing AI-generated reports that visually highlight risk hotspots, show the potential outcomes of different scenarios, and even suggest actionable steps. By presenting complex analytics in such an intuitive manner, AI is breaking down barriers to entry and empowering more individuals and organizations to make informed financial decisions.

- **Stress Testing and Scenario Simulation**
AI-driven simulation tools are becoming an indispensable asset for Indian investors and fund managers by allowing them to rigorously test the resilience of their portfolios. These sophisticated platforms can model a vast array of adverse scenarios, such as sudden policy changes, significant exchange rate shocks, or localized sector-specific crises. This stress-testing capability helps stakeholders visualize the potential extent of losses and evaluate the effectiveness of various hedging strategies in a risk-free, simulated environment. Rather than relying on static, backward-looking models, these dynamic tools provide forward-looking insights that are crucial in India's volatile market. As the technology matures, these platforms are being increasingly customized to reflect specific Indian regulatory frameworks and market conditions, offering a level of

precision and relevance that generic global models simply can't match. This customization ensures that the insights generated are highly actionable and tailored to the unique economic landscape, providing a significant competitive advantage.

Suggestions

- **Integrate AI Analytics in Every Stage of Portfolio Management:** Financial institutions and large investors should move rapidly towards embedding AI-based risk assessments throughout the investment lifecycle—from asset selection and allocation to monitoring, rebalancing, and exit strategies. This ensures continuous oversight and responsiveness to evolving risks.
- **Invest in Data Quality and Infrastructure:** The effectiveness of AI models hinges on the breadth, depth, and accuracy of the underlying data. It is recommended that Indian firms invest in upgrading their data collection and processing pipelines, with an emphasis on local and alternative data sources (e.g., regional news, satellite data, social sentiment).
- **Ongoing AI Model Training and Validation:** Since financial markets and news flows are highly dynamic, regular retraining and performance audits of AI models are essential. Institutions should establish governance frameworks for monitoring AI model accuracy, transparency, and unintended biases.



- **Enhance Risk Communication for All Stakeholders:** Emphasis should be placed on adopting AI-powered risk reporting that translates analytics into actionable, jargon-free insights. Financial educators and advisors should leverage these tools to improve investor literacy and engagement.
- **Prioritize Regulatory Alignment and Ethical Standards:** As AI risk analytics become ubiquitous, firms must ensure strict adherence to Indian regulatory frameworks, maintain transparency with investors, and guard against issues such as data privacy breaches and algorithmic discrimination.
- **Promote Multi - Stakeholder Collaboration:** Open sharing of AI-driven best practices, risk scenarios, and model validation techniques across the financial industry can accelerate trust and build collective market resilience.

Conclusion

The integration of AI-powered real-time risk analytics is fundamentally reshaping portfolio management in India, enabling a new era of proactive, data-driven decision-making. These systems continuously process vast streams of market data, news, and other information, allowing investors to act with unprecedented speed and precision. Key AI capabilities, such as real-time monitoring and AI-enhanced news analytics, provide early warnings of market shifts and sentiment changes before they are visible through conventional indicators. Additionally, machine learning-

based pattern recognition uncovers hidden risks like unusual trading behaviors or credit default probabilities.

Furthermore, AI contributes to market transparency and inclusivity. AI-enhanced reporting solutions translate complex risk models into user-friendly summaries and dashboards, making sophisticated financial analysis accessible to a broader range of investors. AI-driven simulation tools allow for robust stress-testing of portfolios against a variety of adverse scenarios, helping to visualize potential losses and test hedging strategies in a safe environment. While the technological adoption is crucial, the successful integration of AI hinges on sound governance, continuous education, and vigilant regulatory oversight. By blending AI's computational strengths with human judgment, the Indian financial system can achieve a new standard of risk management, minimizing losses, building trust, and creating new opportunities for investors of all sizes.

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