
Implications of Machine Learning on Indian Marketing Strategies

¹Mohan Raparathi, ²Sarath Babu Dodda, ³Dr. Ankit Agarwal, ⁴Abhilasha Singh Upadhyaya, ⁵Dr. Abhishek Sharma, ⁶Sundarapandiyan Natarajan

¹ Software Engineer,

Google Alphabet (Verily Life Science), Texas, USA, : raparthemohan.scholar@gmail.com, ORCID: 0009-0004-7971-9364

²Software Engineer Central Michigan University, USA, sbabudodda009@gmail.com, ORCID: 0009-0008-2960-2378

³Associate Professor, Rajshree Institute of Management and Technology, Uttar Pradesh, India,

ankitagarwal343@gmail.com

⁴Assistant Professor, Jaipuria Institute of Management, Ghaziabad, U.P., India, abhilasha.upadhyaya@gmail.com

⁵Assistant Professor, Mittal School of Business, Lovely Professional University, Punjab, India, Email:

abhisheksharma36934@gmail.com

⁶Professor and Head, Department of Management Studies,

Adithya Institute of Technology, Tamil Nadu, India,

Email: nt_sundar@yahoo.com,

ORCID: 0000-0002-1303-2947

How to cite this article: Mohan Raparathi, Sarath Babu Dodda, Ankit Agarwal, Abhilasha Singh Upadhyaya, Abhishek Sharma, Sundarapandiyan Natarajan (2024). Implications of Machine Learning on Indian Marketing Strategies. *Library Progress International*, 44(3), 3131-3137.

Abstract

This paper explores the effect of machine learning (ML) on Indian marketing strategies, focusing on e-commerce, rural advertising and marketing, and financial services. It highlights the shift from conventional advertising frameworks to data-driven strategies, addressing both advantages and challenges. The paper also explores the distributional effects of ML on specific consumer demographics, particularly in rural settings, and how those technologies can bridge or widen the digital divide. Through analysis of case research and scholarly articles, the studies affords insights into future trends and the need for inclusive virtual advertising practices.

Keywords— Marketing Strategies, Indian, rural, machine learning, E-commerce.

Introduction

There is now more rivalry in the internet-enabled marketplace as a result of the digitization of both information and non-information items. Electronic commerce (E-commerce) has grown as a result of companies incorporating the electronic market into their strategy to boost exposure and get access to the worldwide market. Marketplaces for e-commerce make it easier to find details about products, which allows for shopping comparisons and decision-making processes. In current internet-enabled marketplace interactive marketing—which involves enhanced involvement and information resources to comprehend customer needs—is essential. Nonetheless, businesses find it difficult to pinpoint marketing and engagement approaches that work with the requirements as well as understanding bases of their intended consumer base [1]. The field of marketing has changed throughout the years, having its roots in channels, goods, and functional schools. The four Ps of marketing—product, pricing, location, and promotion—were first presented in 1936 with an emphasis on the packaged products sector. Differential advantage and the process of segmentation positioning as well as and targeting (SPT) strengthened the idea even further [2]. To support marketing researchers conducting study on MSI study Priorities, MSI offered seed money. Because of the post-war spike of consumer demand for branded packaging products, advertising as an academic field and practice expanded dramatically in the 1950s and 1960s.

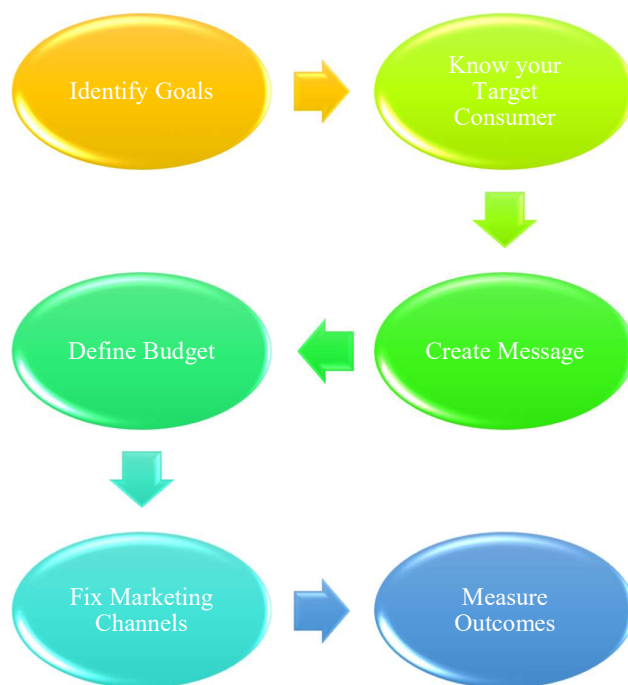


Fig. 1 Schematic Representation of Marketing Strategy

The discipline of digital marketing is expanding and entails advertising goods and services via computerised platforms, such as PDAs, PCs, and cell phones. The use of digital marketing is becoming more and more popular, yet little is known about customer preferences or the effects of automated advertising. Digitalization has sparked the creation of creative advertising strategies in the financial services industry, including the insurance business [3]. The most economical way to sell insurance is online since people frequently buy necessary insurance items that resemble commodities based only on price. Insurance companies and manufacturers are creating websites to take advantage of the economic opportunities presented by the internet. Online insurance purchasing products is a competitive arena, and retail insurance advertisements is distinct from conventional marketing for products. The discipline of digital marketing is expanding and entails advertising goods and services via computerised platforms, such as PDAs, PCs, and cell phones. The use of digital marketing is becoming more and more popular, yet little is known about customer preferences or the effects of automated advertising. Digitalization has sparked the creation of creative advertising strategies in the financial services industry, including the insurance business [4]. The most economical way to sell insurance is online since people frequently buy necessary insurance items that resemble commodities based only on price. Insurance companies and manufacturers are creating websites to take advantage of the economic opportunities presented by the internet. Online insurance purchasing products is a competitive arena, and retail insurance advertisements is distinct from conventional marketing for products. MSME's (micro, small, and medium-sized enterprises) are the backbone of the Indian economy. It employs 110 million citizens and accounts for 48% of India's exports. Therefore, it is essential to assess the challenges, identify them, and devise a plan of action to get past the pandemic-related catastrophe [5].

II RURAL MARKETING STRATEGY

Owing to the growth that has occurred in the countryside as a result of additional unique initiatives and five-year strategies, the rural marketplace currently has a huge unrealized potential. The lives of the poor and illiterate have been improved by development programmes in the fields of agriculture and related industries, medical instruction, interpersonal interaction, rural electricity, etc. Some market organisations predict that in the near future, rural demand would surpass urban demand. As the urban markets become oversaturated with a variety of consumer goods divisions and as rural incomes rise, marketing managers are expanding their markets by scouting out and identifying the advantages of the sizable rural

markets [6]. The concept has developed since then and now takes front stage in any business boardroom strategy session. In the current competitive business landscape, every company aims to optimise its expansion and financial gains. Every single business has unique marketing tactics. Various markets require various marketing approaches. Urban and rural marketing approaches are completely different from one another. One must tap into both the urban and rural markets for the purpose to remain viable in the market [7]. Over the past 20 years, India has seen a substantial change in its social, technological, and economical environments. Globalisation, combined with the liberalisation and privatisation policies that the Indian government started in the early 1990s, has resulted in a significant influx of foreign investments and a proliferation of multinational firms into a wide range of industries. Marketers confront fierce domestic and international competition when these businesses venture into foreign markets. In order to boost sales and market share, financial services—such as FMCG, telecommunications insurance, credit cards, consumer durables, and autos—are now concentrating on areas that are semi-urban or rural [8]. However, there are drawbacks to living in rural areas, including low population density, poor infrastructure, low levels of education, cultural and social regression, and limited disposable income. Higher literacy rates, urbanisation, expanding media and telecommunications services, credit schemes, globalisation, more affordable technological goods, government-sponsored work programmes, tax breaks and loan forgiveness are some of the factors influencing these rising demands and aspirations. Today's rural consumers are better informed, possess greater financial resources, and want a greater value for their money [9]. Assuming that rural consumers are sufficiently price sensitive to buy basic products with insufficient features is ineffective in rural markets. Indeed, the popularity of Nokia phones with built-in torches shows that the rural customer across the nation has more specialised needs for features to fit their more difficult living conditions. Understanding that the rural consumer is a value-conscious individual who looks for value rather than just low price is essential to appealing to them. Innovative approaches are needed in rural marketplaces to promote items and increase consumer awareness [10].

III MACHINE LEARNING APPROACHES IN MARKETING STRATEGIES

Concerns over distributional effects across categories, such as race, have been highlighted by statistical advancements in technology in applications such as credit screening. Theoretically, triangulating otherwise omitted traits or having more flexibility in identifying structural linkages can result in distributional impacts of improved statistical technology. Researchers use both conventional and machine learning models to predict default using data on mortgages in the United States. It has been shown that borrowers who identify as Black or Hispanic have a lower likelihood of benefiting from the implementation of machine learning [11]. Machine learning leads to differences in rates across and within groups in a basic equilibrium credit market model. These variations are mostly caused by increased flexibility. The Internet has increased the study of this data through social media (SM). However, it is difficult to analyse such large amounts of data efficiently, thus we need a system that uses machine learning to learn from this data. Systems can learn on their own thanks to machine learning techniques. Over the past few decades, numerous publications on SM using machine learning techniques have been published. In [12], it employs strong algorithms for machine learning to provide an extensive assessment of numerous applications of SM assessment. First, we go over an overview of the machine learning methods that are applied to SM analysis. Researchers then present an extensive overview of machine learning methods for SM analysis. Innovative research opportunities regarding energy finance and business economics are being created by machine learning (ML). Researchers in [13] conduct a critical analysis of the increasing number of work on machine learning implications in energy economics and finance. Technologies for projecting energy prices (e.g., power, natural gas, and crude oil), prediction of demand, risk management, trading techniques, processing data, and macro/energy trend analysis are listed in this evaluation. With an emphasis on the channels of transmission between stock, bond, and foreign exchange markets, [14] examines the pathways via which collapse occurrences spread throughout global capital markets. Utilising data from 39 countries and machine learning algorithms, the method predicts the likelihood of a stock market meltdown. Classifier based Trees, Machine Learning with Support Vector Machines, Random Forests, Artificial Neural Networks, XG-Boosting, and neural networks with deep learning are some of the methods used in this study. The findings demonstrate the tenacity of stock market meltdowns as well as market interconnectedness and cross-contagion impacts. Deep Neural Networks provide central banks with a more effective early warning system and greatly increase classification accuracy. Vijh and Patel's study in [15] focuses on applying Random Forest and ANN approaches for forecasting stock market results. Vijh creates additional variables for the models, which are assessed using RMSE and MAPE, utilising financial data from five different companies. In his research, Patel uses the Indian stock markets' CNX Nifty and S&P Bombay Stock Exchange Sensex to forecast future values of stock market indexes. Based on a decade's worth of historical data, the tests conducted in [16] to forecast values one, five, and thirty days ahead of time. A two-stage fusion strategy using Support Vector Regression (SVR), Random Forest (RF), (ANN), and SVR is proposed in this

research. Ten technical indicators are used to evaluate the hybrid models with single-stage scenarios that use ANN, RF, and SVR.

TABLE 1 NUMEROUS APPLICATIONS OF MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE IN MARKETING STRATEGY

Area	Application of ML/AI	Benefits	Challenges	Key Findings
Credit Screening	Predicting mortgage defaults; assessing creditworthiness	Improved accuracy in default prediction; potential for more nuanced credit assessments	Potential for reinforcing existing biases; distributional effects across race	ML models may not equally benefit all racial groups, potentially exacerbating disparities
Social Media (SM) Analysis	Analysis of large datasets for insights into user behavior and trends	Ability to process vast amounts of data; uncovering new insights and patterns	Difficulty in analyzing large datasets efficiently; need for sophisticated ML systems	Strong ML algorithms enable comprehensive assessment of SM applications
Energy Finance	Predicting energy prices, demand, risk management, trading strategies	Enhancements in accuracy of prediction; better risk management	Complexity of energy markets; need for diverse ML approaches	ML creates innovative opportunities in energy finance and economics analysis
Market Analysis	Predicting stock market outcomes; assessing market meltdown risks	Increased classification accuracy; early warning systems for market meltdowns	Market unpredictability; need for advanced ML methods	ML models demonstrate the interconnectedness and cross-contagion effects in global markets

Causal Inference in Research	Assessing heterogeneity in treatment effects in observational studies	Data-driven approach to understanding treatment effects across subpopulations	Difficulty in determining "ground truth" for causal impacts	Introduction of innovative cross-validation criteria to better assess causal effects
Financial Inclusion	Enhancing access to financial services for vulnerable populations	Increased participation in mainstream financial markets; improved customer service and fraud detection	Ensuring AI applications do not exacerbate existing inequalities	AI significantly aids in digital financial inclusion, benefiting low-income and marginalized groups

The difficulties of measuring heterogeneity in causal effects in observational or experimental investigations and determining the extent to which treatment effects differ among population subgroups are examined in [17]. To ascertain which subpopulations have significant or minor treatment impacts and to test hypotheses regarding these differences, the method offers a data-driven approach. Although the approach is designed to anticipate the causal effects of a treatment rather than the outcome of a unit, it bears a strong resemblance to supervised machine learning methods. The problem lies in the fact that no single unit can provide the "ground truth" for a causal impact. By means of simulations, [18] present a number of innovative cross-validation criteria and show when and how they outperform conventional approaches in solving the causal effects problem. In order to assess the effort being made to advance machine learning in manufacturing, the article also presents ten years' worth of manufacturing papers, highlighting popular algorithms and ML use cases. The disruptive technology of artificial intelligence (AI) holds the potential to completely transform the marketing industry. The significance of artificial intelligence (AI) in marketing and potential avenues for future study are highlighted by a thorough analysis of the literature covering the years 1982 to 2020. Fintech corporations have employed AI to guarantee that low-income individuals, the impoverished, women, young people, and small enterprises engage in the mainstream financial market [19]. According to [20], artificial intelligence (AI) significantly affects digital financial inclusion in a number of areas, including chatbots, fraud detection, customer service, information asymmetry, measurement, and risk identification. Governments, not monetary entities, and financial companies should adopt AI applications and tools in order to ensure that disadvantaged groups may participate in the traditional banking system with the minimum barriers and maximum benefits.

IV. CONCLUSION

The appearance of machine learning and artificial intelligence has appreciably impacted advertising and marketing strategies in the Indian marketplace, ushering in a new technology of digital advertising and marketing characterized by way of advanced performance, personalization, and patron engagement. Whereas, this change is not without its challenges, particularly in phrases of ethical issues, distributional results, and the virtual divide among metropolis and rural customers. The findings of this examine underscore the significance of developing inclusive advertising techniques that leverage ML and AI to cater to the various Indian client base, making sure that the advantages of these generation are equitably allotted. Furthermore, entrepreneurs and companies should live vigilant to the potential biases and ethical dilemmas inherent in data-driven advertising strategies. As India maintains to navigate its virtual transformation, the position of device learning

in marketing techniques gives every incredible possibilities and massive duties. To capitalize on those advancements, it's far vital for marketers, policymakers, and academicians to collaborate, fostering innovation even as ensuring equity, transparency, and inclusivity in digital marketing and advertising practices.

REFERENCES

- [1] Rosário, A., &Raimundo, R. "Consumer marketing strategy and E-commerce in the last decade: a literature review". *Journal of theoretical and applied electronic commerce research*, vol. 16, no. 7, pp. 3003-3024, 2021.
- [2] Rana, S., Prashar, S., Barai, M. K., & Hamid, A. B. A. "Determinants of international marketing strategy for emerging market multinationals". *International Journal of Emerging Markets*, vol. 16, no. 2, pp. 154-178, 2021.
- [3] Sheth, J. "New areas of research in marketing strategy, consumer behavior, and marketing analytics: the future is bright". *Journal of Marketing Theory and Practice*, vol. 29, no. 1, pp. 3-12, 2021.
- [4] Dash, G., &Chakraborty, D.. Digital transformation of marketing strategies during a pandemic: Evidence from an emerging economy during COVID-19. *Sustainability*, vol. 13, no. 12, pp. 6735, 2021.
- [5] Singh, S., Chamola, P., Kumar, V., Verma, P., &Makkar, N. "Explaining the revival strategies of Indian MSMEs to mitigate the effects of COVID-19 outbreak". *Benchmarking: An International Journal*, vol. 30, no. 1, pp. 121-148, 2022.
- [6] Ahmed, A. "Rural marketing strategies for selling products & services: Issues & challenges". *Journal of Business Management & Social Sciences Research*, vol. 2, no. 1, pp. 55-60, 2013.
- [7] Sneha, R., &Hajira, B. "Rural Marketing Strategies in India: Recent Trends". *East Asian Journal of Multidisciplinary Research*, vol. 1, no. 8, pp. 1527-1536, 2022.
- [8] Khan, N., & Khan, M. M. "Marketing revolution in rural India: Emerging trends and strategies". *Journal of Business Administration and Education*, vol. 1, no. 1, 2012.
- [9] Naidu, A. "Strategies for marketing to the rural customer in India: The 4 as model of rural marketing". *Journal of Rural and Industrial Development*, vol. 5, no. 1, pp. 35, 2017.
- [10] Mande, R. "Rural Marketing in India: Opportunities, Challenges, Key Decision Areas and Marketing Strategies". *International Journal of Creative Research Thoughts*, vol. 8, no. 12, pp. 3215-3230, 2020.
- [11] Fuster, A., Goldsmith-Pinkham, P., Ramadorai, T., & Walther, A. "Predictably unequal? The effects of machine learning on credit markets". *The Journal of Finance*, vol. 77, no. 1, pp. 5-47, 2022.
- [12] Balaji, T. K., Annavarapu, C. S. R., &Bablani, A. "Machine learning algorithms for social media analysis: A survey". *Computer Science Review*, vol. 40, pp. 100395, 2021.
- [13] Ghoddusi, H., Creamer, G. G., &Rafizadeh, N. "Machine learning in energy economics and finance: A review". *Energy Economics*, vol. 81, pp. 709-727, 2019.

- [14] Chatzis, S. P., Siakoulis, V., Petropoulos, A., Stavroulakis, E., & Vlachogiannakis, N. Forecasting stock market crisis events using deep and statistical machine learning techniques. *Expert systems with applications*, vol. 112, pp. 353-371, 2018.
- [15] Vijh, M., Chandola, D., Tikkiwal, V. A., & Kumar, A. "Stock closing price prediction using machine learning techniques". *Procedia computer science*, vol. 167, pp. 599-606, 2020.
- [16] Patel, J., Shah, S., Thakkar, P., & Kotecha, K. "Predicting stock market index using fusion of machine learning techniques". *Expert Systems with Applications*, vol. 42, no. 4, pp. 2162-2172, 2015.
- [17] Athey, S., & Imbens, G. W. "Machine learning methods for estimating heterogeneous causal effects". *stat*, vol. 1050, no. 5, pp. 1-26, 2015.
- [18] Sharp, M., Ak, R., & Hedberg Jr, T. "A survey of the advancing use and development of machine learning in smart manufacturing". *Journal of manufacturing systems*, vol. 48, pp. 170-179, 2018.
- [19] Verma, S., Sharma, R., Deb, S., & Maitra, D. "Artificial intelligence in marketing: Systematic review and future research direction". *International Journal of Information Management Data Insights*, vol. 1, no. 1, pp. 100002, 2021.
- [20] Mhlanga, D. "Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion". *International Journal of Financial Studies*, vol. 8, no. 3, pp. 45, 2020.