



Transforming Marketing Through AI: A Literature Review And Future Research Agenda

Pritee Saxena¹ and Arijit Bhattacharya²

Introduction

Artificial Intelligence (AI) has become a buzzword in today's business landscape, and the marketing realm is no exception. AI's widespread adoption is due to the presence of digital channels and devices frequented by customers have led to an explosion of customer data - big data. As AI can process large amounts of data, learn from it, and make predictions has revolutionised how companies approach marketing. Nowadays, AI algorithms, natural language processing and machine learning can process and analyse large amounts of data quickly and accurately and has made it possible for businesses to understand their customers better, create targeted campaigns, and improve customer experiences. AI is now termed a 'business disruptor' and a 'source of competitive advantage' as businesses can gain customer insight regarding customer behaviour, preferences and patterns that would be impossible to do manually earlier. Not surprisingly, globally, businesses are experimenting to leverage AI to optimise marketing efforts. According to a 2020 report published by MarketsandMarkets, the global market of AI applications in marketing will be USD 26.63 billion by 2025, a CAGR (Compounded Annual Growth Rate) growth of 29.7 per cent between 2020-2025. Major AI applications in marketing include personalisation, predictive analytics, image and speech recognition, chatbots and virtual assistants and marketing automation. In this article, the authors aim to give an overview of AI as a domain, review the literature on the impact of AI on marketing and provide examples of how it has been applied in various industries.

An Overview of the AI Domain

To put it simply, AI means "intelligence demonstrated by machines" (Shieber, 2004), but a more business-relevant detailed definition refers to "machines that mimic human intelligence in tasks such as learning, planning, and problem-solving through higher-level, autonomous knowledge creation." (De Bruyn et al., 2020). According to AI research literature, to solve complex predictive problems of marketing like market forecasting, consumer insights, customer acquisition, price optimisation etc., AI uses 'deep learning' using artificial neural networks (Power 2016; Murray and Wardley, 2014). The commonly used neural networks in business are: multilayer perceptrons, convolutional neural networks and recurrent neural networks.

Multilayer perceptrons a basic type of feedforward neural network which consists of interconnected layers of computational units also known as "neurons". The output of one layer is fed as input into the next layer leading to 'deep learning' capabilities of the system. It is used to gain insight for new customer acquisition, pricing optimisation, forecasting, lead generation. The convolutional neural networks are used for pattern recognition and its diverse applications include image recognition, natural

¹ Dr. Pritee Saxena – IBS Mumbai, India, pritee.saxena@ibsindia.org

² Dr. Arijit Bhattacharya – IBS Mumbai, India, arijit.bhattacharya@ibsindia.org



language processing, time-series forecasting, and customer churning prediction. Lastly, the recurrent neural networks overcome the constraints of the earlier two neural network types as both need clear, finite inputs to function and are unsuitable for 'sequence data' used in tasks such as speech recognition, music generation and sentiment analysis. The recurrent neural networks store information from one time period for analysis in subsequent periods as it can store information in memory for future use. Recurrent neural networks can be used in a range of tasks such as generating sequences, including text, voice, and music, as well as speech recognition, text translation and sentiment analysis.

The types of learning that neural networks are subjected to are supervised, unsupervised, and reinforcement learning. Supervised learning is widely used in marketing, where the neural network learns from 'training data' of both input and output data given to the system for learning. The input data travels deep neural network layers and generates a new set of independent variables. This approach can predict variables such as recency, frequency and seasonality from raw data and retain learning for future predictions.

Unsupervised learning identifies patterns in data without prior labelling and is useful for natural language processing. Reinforcement learning is based on the exploitation-exploration paradigm where the goal is to maximise rewards and minimise punishment in a specific environment. This approach is used in robotics, driverless vehicles, and marketing such as pricing, online advertising, and real-time website design changes. Currently, reinforcement learning is less used in marketing as AI scientists are still trying to solve the challenge of teaching the AI system to manage reward and punishment and handle delayed rewards.

Impact of AI on economic growth

On November 30, 2022, ChatGPT, the AI language model based on both supervised and reinforcement learning techniques was launched by San Francisco based OpenAI. The versatile AI chatbot quickly caught attention of users for its detailed and articulate answers and it had over one million users within four days of its launch, and by January 2023, it crossed 100 million users. The New York Times described ChatGPT as "the best artificial intelligence chatbot ever released to the general public". However, ChatGPT's success should not surprise us as we have already experienced the magic of AI through the products like Apple iPhone assistant Siri, Amazon Alexa, Optimus the Tesla bot, and DeepETA from Uber.

Three countries the United States, Japan and South Korea who have filed 75 per cent of AI-patents are leading the race, according to the World Intellectual Property Organization. The majority of the patent applications are in the area of machine Learning, deep learning and neural networks which have applications in various business fields such as personal devices, human-machine interaction, telecommunications, automobiles, medical sciences, e-governance, smart cities and agriculture. An Accenture report (Szczepański, 2019) forecast that AI could double global annual economic growth rate by 2035 by increasing labor productivity by approximately 40 per cent. AI could create a virtual workforce, through diffusion of innovation that will impact several industries.

A PricewaterhouseCoopers report (2018) predicts that the world GDP could increase by 14 per cent (equivalent of USD 15.7 trillion) by 2030 as the economy shifts from 'Internet of People' to the Internet of Things (IoT). This new economy will be characterised by automation and standardisation of everyday jobs in capital-intensive sectors like transport and manufacturing through use of robots and unmanned vehicles leading to more labor efficiency and personalisation of products and services resulting in more consumption. According to the report this "increased consumption creates a virtuous cycle of more data touchpoints and hence more data, better insights, better products and hence more consumption". This new AI landscape will impact various industries from manufacturing (through the use of IoT, 5G, cloud computing, big data analytics, smart sensors, augmented reality, 3D printing and robotics), marketing



and sales, supply chain management and logistics leading to more competition and the early adopters will benefit enormously for their AI-readiness.

McKinsey Global Institute report (2018) estimates nearly 70 per cent of companies will embrace minimum one AI technology by 2030 to optimise businesses and decision-making. However, this pro-AI shift may lead to job destruction in the short and medium term and job creation in the long-term causing a labor shift across the economy and will prompt the need for reskilling due to change in nature and content of jobs. The World Economic Forum's "Future of Jobs" (Mukhi, 2023) report published in 2020 echoed the same sentiment, reporting that while AI may kill few jobs during the transition but its limitless potential will create many more in the future. However, the job polarisation, may lead to less importance placed on labor rights and trade unions and more on contract workers and self-employed individuals. Also, the AI-automation induced shrink in workforce may nudge the government to tax the robots!

Benefits of AI in Marketing

The integration AI in marketing started in early 2000s when companies started to use data mining and machine learning algorithms to analyse customer preferences and action (Fosso Wamba et al., 2015). Today, AI is adopted in various business processes and sectors to gain competitive advantage in marketing across (Park, 2019). Four major AI applications in marketing are: personalisation, predictive analytics, chatbots, and marketing automation (MarketsandMarkets, 2020).

Personalisation using AI can impact market performance through targeted relevant messages and recommendations causing higher engagement rates, increased lead conversions, and more customer loyalty. According to a 2018 study by Epsilon, personalised emails had an 29% higher open rate compared to non-personalised email (Khan et al., 2020). AI in marketing can analyse "big data" of customers to identify patterns and trends. This helps businesses to create personalised marketing campaigns. For example, Netflix uses AI suggest movies and TV shows based on the users' viewing history. Cosmetics brand L'Oréal's AI algorithm analyses skin color, skin tone and hair texture to recommend the perfect foundation shade for customers, while Nike's AI-based Nike+ App tracks users' speed, distance and heart rate to offers personalised workout programs (Arnold, 2022). An AI algorithm uses predictive analytics to analyse past customer behavior data and predicts future customer trends and behaviors to help marketers optimise marketing strategies and campaigns (Aral and Walker, 2019) and give better customer insights (Wang et al, 2019). Chatbots and virtual assistants answer customer query in real-time 24/7 and gives personalised support which can increase customer satisfaction while reducing the manpower workload and support cost (Chen et al., 2020). For example, H&M uses a chatbot to help customers find products and answer questions about their orders. This has improved customer experiences.

Process automation streamlines repetitive routine tasks e.g. email marketing and social media management allowing human effort to be channelised into more creative strategic pursuits (Harrigan et al., 2018). In the media industry, AI text generators can create SEO-optimized, personalised content such as blog posts, social media posts, and news articles. These tools are useful to produce a large amount of content quickly. The Associated Press, for example, uses an AI tool called Wordsmith to generate news articles on earnings reports.

According to business magazine Forbes, AI in marketing has great potential. Generative AI tools like ChatGPT, DALL-E 2, Bing AI, can produce different types of content, including text, imagery, audio and synthetic data which can revolutionise advertising industry by creating AI-generated campaigns with 'digital humans' (Dans, 2020).

Limitations of AI in Marketing



Despite the advantages of AI in marketing, there are challenges. Use of AI in marketing poses few ethical, security and privacy implications which may adversely affect customer loyalty and trust (De Bellis & Varan, 2020).

First, businesses should ensure that the data they collect is accurate and unbiased as AI algorithms can learn from biased data and perpetuate existing biases. Second, for accurate predictions and recommendations the AI system should be trained on high-quality accurate data as poor-quality data will lead to erroneous conclusion. In a complex, realistic environment, where customers and competition do not always follow rigid rules, modeling consumer or competition behavior is difficult (Harrigan et al., 2018). In reinforcement learning, defining what the AI is supposed to deliver is crucial, as AI lacks common sense. For instance, if an AI is asked to design pricing and promotion with a goal to maximise profit it may end up compromising on sales volumes which will negatively impact customer loyalty and trust.

Third, AI implementation involves cost and investments in specialised skills and expertise (Khan et al., 2020). Fourth, AI cannot fully replace the role of a human in building a trusting relationship (Chen et al., 2020). Also, it cannot be a substitute for human intuition and judgment, creativity and innovation (Aral and Walker, 2019) and it lacks emotion, consciousness, understanding and common sense. (De Bruyn, 2020).. Fifth, the data collected by AI-powered chatbot responses or targeted advertising are vulnerable to hacking, cyber-attacks, intellectual property infringements and identify thefts.

Theoretical Framework

The use of AI in marketing founded on several theoretical frameworks which are described below. Technology Acceptance Model (TAM) refers to how customer intention to adopt new technology is influenced by their perceptions of its usefulness and ease of use. TAM can be used to understand customers' intention to adopt AI-driven marketing technologies (Davis, 1989). Personalisation-Privacy paradox examines the dilemma between customers' yearning for personalised marketing experiences and their concern about misuse of privacy. This paradox is useful to understand how customer balance these two factors when they use AI in marketing (Xu et al., 2019). The Social Exchange Theory helps to understand how users will perceive the costs and benefits of AI technology like chatbots in marketing (Homans, 1958). Customer Lifetime Value model is used to forecast the total value a customer will generate for the company during their lifetime and can be used to predict the long-term impact of personalised marketing using AI (Rust and Chung, 2006). Lastly, the Cognitive Load theory can be used to design AI-driven marketing campaigns that minimise cognitive load and maximise engagement and conversion rates by focusing on how users utilised their cognitive resources to process information, (Sweller, 1988)

Future research directions for AI in marketing

Presently, there is a lack of research that rigorously tests the efficacy of AI-driven marketing strategies (Verhoef et al., 2020). Also, there is limited understanding of how customers perceive AI in marketing and how these perceptions affect their behavior (Chen and Barnes, 2018). As AI gains prominence in marketing, more research is needed to address ethical considerations in AI-driven marketing strategies, e.g. issues of fairness and bias and privacy concerns (KoeHN and Vos, 2018). AI research should also include how to integrate AI with existing marketing frameworks like 4Ps (product, price, promotion, place) (Deighton and Kornfeld, 2019) and assess the long-term impact of AI on customer retention and customer loyalty (Reinartz and Ulaga, 2008). Other research areas may include the development of more sophisticated AI algorithms, the integration of AI with other technologies such as the Internet of Things, and the examination of the ethical implications of using AI in marketing (Wang et al., 2021). Moreover, it is important to investigate the impact of AI on customer behavior and decision-making (Zeng et al., 2021), optimisation of AI-driven personalisation, such as improving the accuracy and



quality of personalised recommendations, identifying factors that influence the effectiveness of personalised marketing (Li et al., 2020) and investigate the use of AI in social commerce, including the development of AI-based recommendation systems for social commerce platforms, and examining the ethical implications of using AI in this context (Huang and Benyoucef, 2019). Other relevant research areas include the exploration of the factors that influence customer perceptions of chatbots, and the impact of chatbots on customer satisfaction and loyalty (Kiatkawsin and Han, 2019; Wang et al., 2019; Vrontis et al, 2018), optimising personalised advertising in real-time by machine learning (Hsu and Lu, 2018), sales forecasting (Han et al. 2019) and optimising influencer marketing strategies (Li and Du, 2020).

Conclusion

In conclusion, this paper has discussed the growth of AI in marketing and its potential for short-term disruption and long-term transformation of the field. The merger of AI and marketing strategies will enable businesses to offer more personalised products and services leading to more customer engagement, satisfaction and loyalty. However, it is critical to ensure that AI technologies are developed and used responsibly and ethically to benefit both business, customers and society. The authors hope that this paper will be helpful for academia and industry, as they navigate the rapidly evolving landscape of AI and marketing.

References

- Aral, S., & Walker, D. (2019). Marketing in the era of big data. *Marketing Science*, 38(3), 319-320. <https://doi.org/10.1287/mksc.2019.1178>
- Arnold, V (2022), Artificial intelligence in brand management, <https://neuroflash.com/blog/artificial-intelligence-in-brand-management/#:~:text=Quite%20simply%2C%20AI%20helps%20companies,analyze%20large%20amounts%20of%20data.>
- Chen, J., Li, W., Li, J., & Yang, K. (2020). The impact of artificial intelligence on marketing: An exploratory study. *Journal of Business Research*, 116, 225-237. <https://doi.org/10.1016/j.jbusres.2020.05.042>
- Chen, Y., & Barnes, S. J. (2018). Initial trust and online reviews: The influential factors of trust in purchasing from Airbnb. *Journal of Travel Research*, 57(3), 1-17. <https://doi.org/10.1177/0047287517693756>
- Dans, E. (2020), The Digital Human And The Society Of The Future, <https://www.forbes.com/sites/enriquedans/2020/01/06/the-digital-human-and-the-society-of-the-future/?sh=30a7d3777c11>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340. <https://doi.org/10.2307/249008>
- De Bellis, E., & Varan, D. (2020). Artificial intelligence and ethics in marketing. *Journal of Advertising Research*, 60(1), 9-13. <https://doi.org/10.2501/JAR-2020-003>
- De Bellis, E., & Varan, D. (2020). Artificial intelligence and ethics in marketing. *Journal of Advertising Research*, 60(1), 9-13. <https://doi.org/10.2501/JAR-2020-003>
- De Bruyn, A., Viswanathan, V., Beh, Y. S., Brock, J. K. U., & Von Wangenheim, F. (2020). Artificial intelligence and marketing: Pitfalls and opportunities. *Journal of Interactive Marketing*, 51(1), 91-105.
- Deighton, J., & Kornfeld, L. (2019). *Digital marketing strategy: Text and cases*. MIT Press.



- Epsilon. (2018). The power of me: The impact of personalisation on marketing performance. Retrieved from <https://us.epsilon.com/-/media/files/epsilon/us/resources/whitepapers/2018/2018-q2-power-of-me-report.pdf>
- Fosso Wamba, S., Akter, S., Edwards, A., Chopin, G., & Gnanzou, D. (2015). How 'big data' can make big impact: Findings from a systematic review and a longitudinal case study. *International Journal of Production Economics*, 165, 234-246. <https://doi.org/10.1016/j.ijpe.2015.03.013>
- Han, J.-K., Kim, J., & Lee, J. (2019). Artificial intelligence in retail: A review. *Journal of Retailing and Consumer Services*, 51, 390-397. <https://doi.org/10.1016/j.jretconser.2019.05.001>
- Harrigan, P., Evers, U., Miles, M., & Daly, T. (2018). Customer engagement with chatbots and virtual assistants. *Journal of Service Research*, 21(3), 332-347. <https://doi.org/10.1177/1094670518763639>
- Homans, G. C. (1958). Social behavior as exchange. *American Journal of Sociology*, 63(6), 597-606. <https://doi.org/10.1086/222355>
- Hsu, C.-L., & Lu, H.-P. (2018). A machine learning approach for effective personalised advertising. *Information & Management*, 55(8), 940-950. <https://doi.org/10.1016/j.im.2018.03.005>
- <https://www.mckinsey.com/~media/McKinsey/Featured%20Insights/Artificial%20Intelligence/Notes%20from%20the%20frontier%20Modeling%20the%20impact%20of%20AI%20on%20the%20world%20economy/MGI-Notes-from-the-AI-frontier-Modeling-the-impact-of-AI-on-the-world-economy-September-2018.ashx>
- Huang, Z., & Benyoucef, M. (2019). From e-commerce to social commerce: A close look at design features. *Electronic Commerce Research and Applications*, 35, 1-14.
- Khan, R., Ahmed, W., & Kim, S. (2020). The impact of artificial intelligence on marketing: A review and future research directions. *Journal of Business Research*, 114, 255-263. <https://doi.org/10.1016/j.jbusres.2020.03.012>
- Kiatkawsin, K., & Han, X. (2019). Understanding chatbot-mediated customer service encounters: The roles of perceived risk and benefit. *International Journal of Hospitality Management*, 81, 58-69.
- Kim, S., Kim, S., & Shin, D. (2020). The future of AI in marketing: A bibliometric analysis. *Journal of Business Research*, 116, 196-202.
- Kim, Y.-H., & Song, J. (2021). Personalising email marketing messages with artificial intelligence: An empirical investigation. *Journal of Marketing Analytics*, 9(1), 38-49. <https://doi.org/10.1057/s41270-021-00109-9>
- Koehn, D., & Vos, M. (2018). Ethical considerations of AI in business and management. *Journal of Business Ethics*, 150(4), 961-964. <https://doi.org/10.1007/s10551-018-3811-y>
- Li, J., & Du, S. (2020). Identifying key social media influencers using machine learning in influencer marketing. *Journal of Business Research*, 117, 674-684. <https://doi.org/10.1016/j.jbusres.2020.07.010>
- Li, Y., Li, H., & Zhang, X. (2020). Enhancing customer value through AI-driven personalisation: An empirical study. *Journal of Business Research*, 113, 301-310.
- MarketsandMarkets. (2020). AI in Marketing Market by Component, Application, Deployment Mode, Organization Size, Industry Vertical, and Region - Global Forecast to 2025. Retrieved from <https://www.marketsandmarkets.com/Market-Reports/ai-in-marketing-market-3175268.html>
- Mukhi, S., An AI-deal world: How AI can shape the advertising sphere, <https://brandequity.economictimes.indiatimes.com/news/digital/an-ai-deal-world-how-ai-can-shape-the-advertising-sphere/96892000>
- Murray, G., & Wardley, M. (2014). The math of modern marketing: How predictive analytics makes marketing more effective. IDC White Paper. Retrieved from http://www.sap.com/bin/sapcom/en_us/downloadasset.2014-06-jun-12-15.the-math-



- ofmodern-marketing-how-predictive-analyticsmakes-marketing-more-effectivepdf.bypassReg.html
- Park, Y. J. (2019). (The) impact of artificial intelligence on firm performance. <http://library.kaist.ac.kr/search/detail/view.do?bibCtrlNo=876067&flag=dissertation><https://www.pwc.co.uk/economic-services/assets/macroeconomic-impact-of-ai-technical-report-feb-18.pdf>
- Power, D. J. (2016). “‘Big Brother’ Can Watch Us,” *Journal of Decision Systems*, 25(1), 578- 588.
- Reinartz, W., & Ulaga, W. (2008). How to sell services more profitably. *Harvard Business Review*, 86(5), 90-96. <https://hbr.org/2008/05/how-to-sell-services-more-profitably>
- Rust, R. T., & Chung, T. S. (2006). Marketing models of service and relationships. *Marketing Science*, 25(6), 560-580. <https://doi.org/10.1287/mksc.1050.0172>
- Shieber, S. M. (Ed.). (2004). *The turing test: Verbal behavior as the hallmark of intelligence*. Cambridge: MIT Press.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12(2), 257-285. https://doi.org/10.1207/s15516709cog1202_4
- Szczepański, M., (2019), [https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/637967/EPRS_BRI\(2019\)637967_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/637967/EPRS_BRI(2019)637967_EN.pdf)
- Verhoef, P. C., Broekhuizen, T., Bart, Y., & Bhattacharya, A. (2020). Digital marketing: A framework, review and research agenda. *International Journal of Research in Marketing*, 37(3), 341-358. <https://doi.org/10.1016/j.ijresmar.2020.02.001>
- Vrontis, D., Thrassou, A., & Gheorghiu, R. (2018). Exploring the AI revolution: The rise of chatbots in tourism. *Journal of Destination Marketing & Management*, 8, 221-224.
- Wang, D., Chen, X., & Liang, Y. (2021). The future of artificial intelligence in marketing: An empirical study of AI use in marketing. *Journal of Business Research*, 124, 46-60.
- Wang, D., Li, X., & Liang, X. (2019). The impact of artificial intelligence on customer experience and loyalty in hospitality. *Journal of Hospitality and Tourism Technology*, 10(1), 1-14. <https://doi.org/10.1108/JHTT-08-2018-0072>
- Wang, D., Lu, Y., & Sun, Y. (2019). Enhancing customer insight from online reviews with artificial intelligence: A comparison of deep learning and conventional methods. *Decision Support Systems*, 118, 1-12. <https://doi.org/10.1016/j.dss.2018.11.003>
- Xu, H., Teo, H. H., & Tan, B. C. (2019). Personalisation-privacy paradox: Conceptual link and research agenda. *Information & Management*, 56(2), 103-115. <https://doi.org/10.1016/j.im.2018.07.004>
- Zeng, Z., Chen, X., & Li, Y. (2021). Future research directions of artificial intelligence in digital marketing. *Journal of Business Research*, 130, 56-67.