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Role of emerging technologies in marketing and decision making – PRISMA Model

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Abstract

In recent years technology and its applications have brought a lot of transformation into business and various industries. ChatGPT, natural language processing, machine learning, and deep learning have become the buzzword and have taken the world by storm. It has brought a lot of transformation to the industry. The latest ChatGPT-3 have helped to determine the megatrends i.e., technological, demographic, economic and societal changes. Sentimental analysis is used in the healthcare industry using Ernie-Tiny and BiGRU to understand the patient's challenges. Artificial neural networks, deep learning models and hybrid models are used in the transportation industry to estimate vehicle efficiency and effectiveness. Artificial

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Intelligence in Biobanking studies helps to understand the pathological outcomes of patients in the medical care sector. Blockchain, another cutting-edge technology, is a decentralised network of blocks used to safeguard the accuracy of transactions. Utilising business analytics has improved efficacy, efficiency and productivity due to the internet of things. The paper analyses the various research papers available in Pro-quest and Google Scholar. The paper also presents the benefits of emerging technologies in sector and business growth. This paper reviews the role of emerging technologies in different sectors through a literature review. Based on the bibliometric analysis conclusions are been provided.

Subject Classification: *68T01.*

Keywords: *Emerging technologies, IOT, Blockchain, Business analytics, Chat GPT.*

1. Introduction

Artificial intelligence can be placed under the heading of developing technologies. Two Indian towns are well-known as tech hubs that are reshaping the future, according to the Nasscom report 2023. The Indian emergent technology industry has experienced a compound annual growth rate of nine percent. Currently valued at 54 billion US dollars, the business is projected to climb 200 percent to 108 billion by 2030. The rise Numerous company prospects, goods, procedures and services have benefited from it [5]. Although there is a lot of uncertainty, developing technology is a fantastic source of inspiration, innovation and creativity [1]. New technology has added value to the company and created opportunities for growth [2]. New markets, consumers and geographic areas have all been brought about by emerging technology, opening the door for healthy competition. During the COVID-19 epidemic, emerging technologies were crucial. The consumer's use of and understanding of digital payments was the greatest innovation [8]. Potential clients have entered the market and thanks to the growth of the Fintech sector and digital payments.

Artificial intelligence is a new term in the 21st century. This term is in focus by the academicians, government and business. It has been in existence for the past 60 years. It belonged to the discipline of computer science and information technology. It involves cognitive, smart and intelligence at the highest level to perform various activities. Now at present, there has been tremendous development in the usage of AI in all fields and it has started to be the talk of the town. Continuous improvements in algorithms have made AI to be the most sought after. Artificial intelligence has been in various forms from computers and the internet to small gadgets and devices. It is defined by Minsky 1968 as the "science of making machines capable of performing tasks that would require intelligence". Here science, tasks, capacity, and human and artificial intelligence combined together can make things better. The origin of AI has met a lot of developments called "AI Springs" and deteriorations named "AI Winters".

It was first used in the field of academics in the 1950s. Now due to the availability of Big Data which is practical and to huge computing power, it has started to rock the field of business environment. The roots of AI started in the 1940s, by Isaac Asimov through a short story named Runaround. Alan Turing has been another amazing contributor, who developed a code called The Bombe, which helped to interrupt the Enigma code. Contributors like Gregory Powell and Mike Donavan have made their contributions towards the robotics laws. They are: 1. robots will not get injured and robots may obey orders. These laws are in practice in the field of computer science. In the initial stage, the research on AI was not much encouraged by the governments. James Lighthill, a mathematician prepared a report on the pessimistic outlook of Artificial intelligence use. Hence the funding for research into AI was stopped and was considered a major setback. However, the Japanese government encouraged AI research and other country governments also started to encourage research on AI again. This was the stage in the 1980s. Drastic improvements in the field of AI were possible during the year 1990s by using it in the field of games and sports, specifically in the game of chess. Expert systems were not taken forward because it was not able to recognise the facial expression of the people. Much cognitive intelligence needs to be developed as a part of Artificial Intelligence

Artificial intelligence has also played a part in the shift that has occurred in business [11]. Multinational corporations have favoured AI because of its ability to generate precise outcomes and make forecasts in a timely manner. For the organizations, this has resulted in cost savings. [22] result shows that the application of AI has improved strategic management. These days, using AI is a transdisciplinary idea across all domains. Looking into the development and use of emerging technologies n Georgia ICT readiness, Human resource, Safety and security were the major factors contributing to the usage of Artificial intelligence as emerging technology in their organizations as per the study by. A cross country study by [24] about the usage of Artificial Intelligence, Chat bots in the financial industry. The study was conducted among the respondents of Nigeria, Canada, Europe. In Nigeria the usage of Artificial Intelligence in business should be started as a trend. In countries like Canada, Europe, USA and Brazil if Aritificial Intelligence is implemented in the lending industry the services can be rendered in more responsible, fairer and rapid manner as per the study. A recent study in Bangladesh by Islam et al. [19] highlights that Artificial Intelligence are used to acquire and hire talented personnels.

The studies viewed in review of literature does not specifically show on the usage of artificial intelligence in business. Hence the paper looks into the systematic review approach in the form of PRISMA model on the contribution of Artificial Intelligence in marketing. Third the study tries to find out contributable factors towards growth of marketing under Indian context.

Review of literature

The increasing prominence of AI in marketing, as recognized by Indian experts, offers valuable insights into the challenges and opportunities associated with integrating AI into marketing strategies. It underscores the necessity for organizations to adapt to this evolving landscape, as highlighted. This acknowledgment reflects a fundamental shift carried by emerging technology called artificial intelligence in the advertising domain. The impact of the 4^{th} Industrial revolution on corporate operations is undeniable, focusing on the core element of success: providing outstanding customer experiences. AI and predictive analytics emerge as crucial tools in achieving exceptional customer experiences. Disruptive technologies, explored by have significantly altered the corporate landscape, emphasizing the need to explore AI's possibilities in various industries. The Fourth Industrial Revolution's reshaping of business practices, with a central focus on customer experience, is highlighted by Arnaud De Bruyn et al. [13] The dynamic landscape of AI in marketing encompasses strengths, potential dangers, and the critical issue of information transmission. It is imperative for marketers to leverage AI's strengths while being mindful of potential pitfalls like data bias and privacy concerns. Effective information transmission within AI systems and between organizations is essential in navigating this transformative era. position AI as a significant technological disruptor with immense potential across sectors like manufacturing, pharmaceuticals, healthcare, agriculture, logistics, and digital marketing [21] [23]. AI's integration into marketing offers new ways to interact with consumers and enhance strategies, as cautious implementation is expected to evolve with positive results. Krystyna and Mazurek [20] assert that AI is already playing a crucial role in reshaping how companies make strategic decisions, particularly in marketing. While enhancing decision quality and efficiency, its broader impact on organizational structures and strategies will become more evident as businesses continue to adapt. [35] discuss the changing landscape of business and marketing in the digital age, emphasizing the significance of customer-centricity, data-centricity, and AI integration. [18] underscores the transformation from reactive to proactive business and marketing practices, emphasizing customer and data-centric approaches, the embrace of digital tools, and the growing significance of AI. Bueno and Balestrin [7] anticipate AI's on going evolution, becoming more intelligent and potentially surpassing human creativity. The implementation of AI is seen as central to the future of marketing, requiring marketers to adapt to this new technological landscape [9]. Studies highlight that publicizing decision support systems (MMSS) are often applied in situations where they may not be the best fit. The compatibility between marketing problem-solving modes and decision support technology significantly impacts the effectiveness of the support system. In the B2B sector, Chintalapati and Pandey [10] emphasizes the increasing role of AI, necessitating the use of CRM systems to effectively manage company information and adapt to the evolving marketing landscape. AI's importance in logistics and Supply Chain Management, emphasizing its applications and potential areas for further research and industrial adoption. The importance of adapting to fast-paced changes brought about by AI and the Internet, emphasizing the need for innovative marketing strategies and strategic brand management for sustainable development. [10] suggests managerial implications, viewing AI and big data analytics as means to improve efficiency and market orientation. Industries are encouraged to leverage advanced technology for performance improvement, with a call for research on AI adoption in various disciplines to promote co-creation and innovation. Cui et al. [12] introduce a strategic framework for marketers to effectively leverage AI for marketing impact, guiding the use of various AI intelligences in marketing research, strategy, and action. Keegan, Dennehy, and Naudé [6] acknowledges the multifaceted advantages of AI adoption, recognized not only by marketing managers but also by senior management within organizations. The complex and evolving nature of AI ethics in marketing is underscored and advocated for a balanced approach considering ethical principles and potential societal benefits. Bruyn et al. [13] emphasizes the pivotal role of AI in developing marketing plans, particularly for e-marketing organizations. Review studies makes researchers to anticipate substantial impact from sales digitization technologies encompassing digitization and artificial intelligence. AI's applications beyond marketing, making significant contributions in healthcare, manufacturing, operations management, and transportation [26]. More researchers discuss the integration of mechatronics, robotics, cloud computing, and AI into various sectors, showing the evolving nature of leadership. Many organizations take actions as to proposed taskforce as a proactive step towards addressing ethical challenges associated with AI in marketing [27]. Many authors introduced an artificial neural network classifier and inference engine, showcasing practical impact in resolving destination marketing challenges [30] [31]. In conclusion, the passage paints a comprehensive picture of AI's transformative impact on marketing, urging organizations to adapt and leverage its potential across various sectors [25]. The narrative unfolds the evolving landscape of marketing in the digital age, marked by innovation, customer-centricity, and the integration of AI technologies [14].

Methodology

Source: Litmaps.com (Authors own compilation)

Figure 1

Showing the Initial identification of articles on Role of AI in marketing and decision making with author details

Referred reporting items for systematic reviews and meta-analyses (PRISMA)

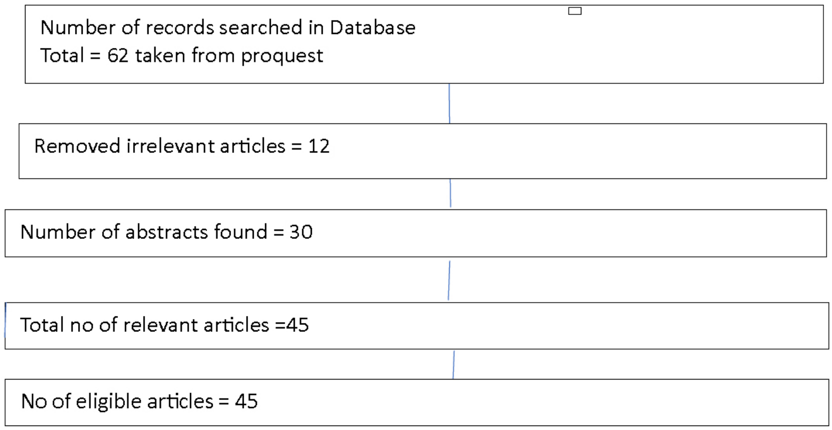


Figure 1

Source: Authors own compilation

Research Questions

1. What is the contribution of artificial intelligence in marketing and business decision making?

Objective of the study:

To observe the contribution of artificial intelligence in marketing and business decision making through literature review.

Data source

ProQuest articles were used as the primary data source for the data identification. The articles were collected from Scopus and other indexed data bases.

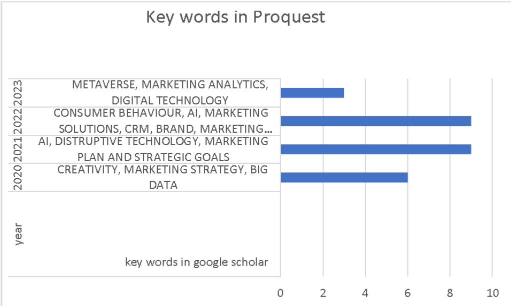
Data collection

The prominence of artificial intelligence are felt from 2022 and increased in 2023. The data collected from the time period includes from 2000 to 2023. Hence 10 years of articles were looked into. Only original full readable texts were taken into consideration.

Results

Table 1

Showing the key words used in selection of articles



The table 1 highlights the use of key words used by the authors on AI. This words are taken from the various sources. Key words consumer behaviour, AI and disruptive technology in marketing are frequently used by the authors.

Table 2

Shows the number of research articles in Pro-quest are published on topic relating to emerging technologies

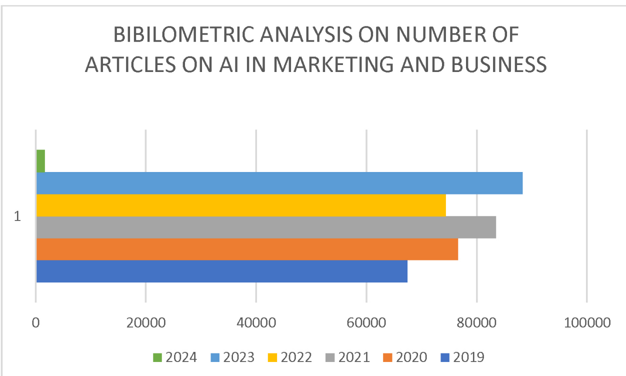


Table 2 explains the bibliometric analysis based on the number of articles found in the data base.

The below mentioned journals from Scopus and other indexed journal with the number of articles.

1. East Asian Journal of Multidisciplinary Research 01
2. Entrepreneurship 01

3. International Journal of Information Management Data Insights Scopus 01
4. Journal of Business Research 01
5. Central European Business Review 01
6. The TQM Journal 01
7. Journal of Business Research 01
8. Journal of Retailing 01
9. Indian Journal of Economics and Business 01
10. International Journal of Market Research 01
11. Ekev Akademi Dergisi 01
12. Industrial Marketing Management 01
13. Journal of Business Research 01
14. Journal of Sensors 01
15. Journal of Marketing Strategies 01
16. Research gate publications 01
17. Springer Nature Switzerland 01
18. Journal of Metaverse 01
19. Procedia - Social and Behavioural Sciences 01
20. Journal of Marketing 01
21. Procedia - Social and Behavioural Sciences 01
22. HAL open science 01
23. Journal of Business Ethics 01
24. Information Systems Frontiers 01
25. Journal of the Academy of Marketing Science 01
26. Business: Theory and Practice 01
27. IOP Publishing 01
28. Hindawi
29. Journal of Sensors 01
30. Computers 01
31. Applied sciences 01
32. Revista Brasileira de Marketing 01
33. Electronics 01
34. Cogent Business & Management 01

35. Marketing Intelligence Review 01
36. Economic Research-Ekonomska Istraživanja 01
37. International Review of Management and Marketing 01
38. Information 01
39. Central European Business Review 01
40. Computational Intelligence and Neuroscience 01
41. Business: Theory and Practice 01
42. Journal of Clinical Medicine Review 01
43. International Review of Management and Marketing 01
44. Artificial Intelligence in Wholesale and Retail 01
45. Marketing Intelligence Review 01
46. SAJEMS NS 01
47. Sustainability 01

The above 47 journal list highlights the number of articles pertaining to usage of AI in marketing and decision making in business

Table 3

Top Cited Marketing Journals Related to Artificial Intelligence

Sl. No	Journal Name	Website	Topic	Author	Citation
1	Journal of Service Research 2018	sagepublication.com	AI in service	M.H Huang, RT Rust	2127
2	California Management Review 2019	researchgate.net	A brief history of AI: On the past, present and future of AI	Michael Haenlein, Andreas Kaplan	1678
3	Journal of the academic of marketing science 2019	springer.com	How AI will change the future of marketing	T.Davenport, A Guha, D Grewal, T.Bressgott	1245

Table 3 discusses on the top cited marketing journals related to artificial intelligence. The Journal of Service Research comes in the top cited list.

Discussion

The article highlights on the areas of artificial integration and the benefits received. Artificial intelligence has been discussed in the form of emerging and disruptive technology. It includes other emergence technologies like cryptocurrency, block chain technology, business analytics which have contributed the way business works. Emerging technologies have provided knowledge to the systems and process in various industries [4]. During 21st century the contribution of AI towards consumer research in marketing is tremendous in nature. Research has been carried out in the areas of B2B, behavioural decision models, branding, sales force management, product innovation etc. In marketing concept, it is important to look into the eco-system and implement proper strategies for successful decision making [6].

The ideas of big data, marketing practice and predictive analytics has been a part of marketing and decision making. The marketing data has been used by the organizations to understand the trends of the consumers and consumer buying behaviour [30]. The data also helps to understand the challenges, pitfalls and the opportunities in marketing for the manufacturers. Artificial intelligence can also be used ethically in the field of marketing [13].

Artificial intelligence also contributes towards the right marketing mix towards the success of the products by marketing organizations. It helps in better strategy formulation and determination of better business models, performance It helps to provide systematic guidance which helps to maximize the optimum mix [15]. Customer sentiments, loyalty and trust can be better understood in marketing with the help of artificial intelligence [16]. Marketing along with artificial intelligence helps to provide a framework for retailers, marketers and consumers [17]. Marketing field is witnessing a large transformation where the role of digital marketing and visualization is more essential [18]. Slowly marketing organizations are also making use of chatbots to understand the online customer intentions in better manner [9]. It is important to maintain good relationship with the customers and trying to understand customer needs is a must [19]. The Indian construction industry has also started to utilize its technologies for marketing its products. Usage of BIM technologies have helped the organizations to overcome the existing challenges practically [3]. Technology is also adopted in Indian Small and medium enterprises. Emerging technologies like Artificial Intelligence, ChatGPT and social media has really helped in decision making process of small and medium enterprises [29]. As per studies by [29] the global markets have made digital marketing as their base in real time marketing which has helped the job to be done in smarter and effective manner. Supervised machine learning techniques also do provide credible and authentic information in marketing. It helps to reduce the fake news and misleading news about the products as per the study by [28]. All the factors discussed above contribute to the growth of marketing in Indian context.

Conclusion

Based on the review of literature the artificial intelligence along with marketing concepts are really useful in decision making. It has been used in different areas like strategic formulation, B2B etc. But with the help of artificial intelligence, it needs to be used more in the field of digital marketing. Chatbots concepts along with marketing can be used to become more strategically successful. Finally artificial intelligence an emerging technological concept can be used to realize the customer needs which helps the companies to improve their brand image and customer relationship management.

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