

Current state and future development of artificial intelligence in marketing

Yuze Mao

Durham University, Durham, DH13LE, United Kingdom

yuze.mao@foxmail.com

Abstract. Artificial intelligence (AI) has emerged as a trend in various industries. In the marketing field, artificial intelligence has been the main driver of its growth and an important tool for companies, organisations, and marketing specialists. However, there is a gap between the existing AI research and the actual application of the technologies in marketing. To bridge the gap, this study focuses on the current state of research on artificial intelligence in marketing and AI technologies used in marketing. Research articles on this topic are searched from the ScienceDirect database and the IEEE Xplore database and the non-empirical studies are filtered out by selection criteria. Then the selected articles are analysed using the method of bibliometrics and content analysis. This study describes the landscape of research in artificial intelligence in marketing, summarises AI technologies applied in the marketing field, provides advice on applying AI applications to marketing for marketing specialists, and presents future research directions for AI specialists. Results show that the application of AI in marketing will increase fast in the coming years. In particular, companies and organisations may greatly benefit from the use of AI technology in marketing to increase sales, cut costs, improve firm productivity, boost innovation, and achieve organisational goals.

Keywords: Artificial Intelligence, AI, Artificial Intelligence Technology, Marketing.

1. Introduction

The term artificial intelligence was first used in the 1950s at Dartmouth College. It is then founded as a research discipline based on the hypothesis that any part of learning and all other characteristics of intelligence may, in theory, be so thoroughly described that it can be simulated by a machine [1]. Since then, artificial intelligence has been applied in different areas to improve productivity [2-4]. In the field of marketing, AI technologies have also been changing how businesses and organisations attract their target audience. By 2030, artificial intelligence in the marketing field is anticipated to produce a 47 billion dollar market at a compound annual growth rate of 28.6% [5]. As AI technology has flourished, so have its applications in marketing, with tremendous potential to increase marketing channels, deliver marketing strategy, boost marketing results, and provide better segmentation, targeting, and positioning [6].

There is a lack of integrated research on the state of work generated on artificial intelligence in the field of marketing [7]. And there is a significant disconnect between what artificial intelligence marketing technologies are capable of and how they are being applied in real-world marketing situations [8]. This article aims to aid a larger marketing community, including companies, organisations, business

owners, marketing workers, marketing researchers, and artificial intelligence product developers, in developing a greater comprehension of artificial intelligence in marketing. This is done in an effort to enhance artificial intelligence technologies for marketing through a variety of analysis techniques. This in-depth study of linked literature specifically tries to accomplish the following objectives: first, the study aims to provide companies, organisations, and marketing and AI technology specialists with useful advice. Second, it intends to encourage interaction and cooperation amongst stakeholders in various areas of marketing. Third, it helps to comprehend research in artificial intelligence in marketing and development from the perspectives of current technologies. At last, it attempts to bridge the gap among the research, development, implementation, and assessment of artificial intelligence in marketing.

Thus, by centring on marketing, this study presents an overview of current studies on artificial intelligent technologies using the method of bibliometrics [9,10] and content analysis [11–13]. This study aims to find out the following four points throughout the process of searching and analysing the literature in the field of AI in marketing: 1. the distribution of existing AI marketing-related research; 2. the AI marketing technologies studied in the selected articles; 3. the benefits the technologies have on marketing; 4. the effect recent research have on AI marketing.

2. Methodology

2.1. Bibliometrics and content analysis

Bibliometrics is a tool broadly used since 1969 for tracking the overall state of scientific research at a certain degree of specialisation in order to observe the state of a certain field of study [9,10]. Content analysis is a method to examine the subject in articles used by researchers since 2009 to review publications on a certain topic [11–13]. This study chose bibliometrics and content analysis as the analysis methods.

2.2. Source database

Bibliometric research must come from a source database [9]. The ScienceDirect database and the IEEE Xplore database were chosen as the source databases of the scientific literature of this study. ScienceDirect database and IEEE Xplore were selected because high-quality journals from the social sciences and natural sciences are included in these databases and they are web-based databases that allow for in-depth bibliometric analysis [9].

2.3. Searching and selection criteria

Bibliometric research utilizes scientific parameters including articles and citations [9]. To acquire the parameter for this study, the source database was searched using various keyword combinations such as "AI", "artificial intelligence", and "marketing". A total of 136 publications were initially found by selecting the most relevant article titles after three rounds of searches on ScienceDirect; five non-English articles were disregarded in the preliminary screening. The following search criteria were applied in order to accomplish the aim of this research:

- Only English-language journal publications presenting empirical studies were chosen.

- Non-English publications were excluded.

- Theoretical or conceptual articles were excluded.

- Reports of personal user experiences and articles reporting insufficient or no data were excluded.

- Research without human participants was excluded.

- Research unrelated to marketing or artificial intelligence was excluded.

- Quantitative Research with fewer than 20 participants was excluded.

- Additionally, in the process of selection, these criteria were applied:

- Research must focus on the impact of artificial intelligence on marketing.

- Research must have enough human participants.

- Research must be based on empirical studies.

- Research must not be a literature review.

During the selection process, 116 research papers were filtered and 11 research papers were selected for this analysis. Of those filtered articles, literature review articles were thoroughly read to gain a better understanding of this topic. Qualified articles were examined to identify these factors: bibliometrics, place of study, demographic of the sample, artificial intelligence technologies, and the impact on marketing. A list of indicators is advanced to conduct this review: bibliometrics of the article including the date of publishment, authors and journal of the article, place of the study conducted, participants of the study including the age and industry of the marketers, technologies mentioned in the survey, and the marketing effects.

3. Results

3.1. Study sites

Artificial intelligence in marketing has been studied all over the world. Study sites from the 11 selected articles are located in 9 countries including India, the US, South Africa, Saudi Arabia, China, Serbia, Indonesia, Egypt, and the UK.

3.2. Participants and sample sizes

The sample sizes of the research on artificial intelligence in marketing differ hugely. The number of participants ranges from 30 [14] to 492 [15]. The geographical background and social status of the participants also range vastly, ranging from Europe [16,17], Asia [15,18], Africa [19,20], to North America [14,21] and from students [16], scholars [17] to senior managers [22]. For instance, Keegan et al. [17] analysed the adoption of artificial intelligence in business-to-business marketing, and this study sampled people from experts on AI research as well as suppliers of AT technologies. However, most of the participants are between 22 to 35 years old as these people are more familiar with AI applications [23] and therefore there is a lack of research on participants who are older than 50 years old (See Table 1).

Table 1. An overview of the place of study and participant demographics of artificial intelligence in marketing research.

Study Site Location	n	Article	Participants
			276 millennials between 22-37 years old
India	2	[18,23]	349 managers of 27 B2B organisation that uses artificial intelligence-based customer relationship management
			368 participants between 25–48 years old that are users of an AI application
US	2	[14,21]	30 marketing managers, product or brand managers, and sales managers
South Africa	1	[22]	306 senior executives including General managers, senior managers, managers, and junior managers.
Saudi Arabia	1	[19]	131 participants of diverse backgrounds
China	1	[15]	492 citizens who had used a tax AI assistant service
Serbia	1	[16]	61 millennial students between 19 - 35 years old
Indonesia	1	[24]	399 consumers of a company

Table 1: (continued).

Egypt	1	[20]	168 AI experts at IT departments of 20 international AI-powered organisations in Egypt
UK	1	[17]	20 participants including B2B firms deploying AI solutions, AI suppliers, and scholars that are experts on AI in B2B

To sum up, participants of existing research on artificial intelligence in marketing have diverse backgrounds, occupations, and social statuses but they come from relatively homogenous age groups.

3.3. Collaborations in AI in marketing studies

The majority of the research papers on this topic are the achievements of more than one author. Only 3 articles of the 11 are written by one author [14,19,21]. Some studies are even collaborations of scholars in different countries [18].

3.4. Industries

Research in this field has been conducted in various industries including pharmacy, tourism, entertainment, e-commerce, manufacturing, mining, banking, and telecommunications [14,20,22,23].

3.5. Technologies

Artificial intelligence applications have been utilised in numerous aspects of marketing. The selected studies conducted investigations on applications including virtual assistants, chatbots, machine learning, e-marketing tool, and expert systems (See Table 2).

Table 2. An overview of the AI technologies investigated in artificial intelligence in marketing research.

Study Site Location	Article	Technologies
India	[23]	Recommendation systems, Automated customer support service, Mobile/virtual assistants
India	[18]	Artificial intelligence-based customer relationship management
US	[21]	Voice assistant
US	[14]	Chatbot, fraud detection, text recognition, image and voice recognition
China	[15]	AI voice assistant.
Serbia	[16]	Chatbots
Indonesia	[24]	E-marketing tool
Egypt	[20]	Machine learning, expert systems

4. Conclusion

The use of artificial intelligence in marketing is anticipated to increase fast in the coming years as artificial intelligence technology is developing quickly. In particular, companies and organisations may greatly benefit from the use of AI technology in marketing to increase sales, cut costs, improve firm productivity, boost innovation, and achieve organisational goals.

One of the limitations of this study is related to the choice of scientific literature databases and articles. Firstly, the terms utilised in the search include terms like “marketing and artificial intelligence”. This is normal for any search engine or technique. This review can therefore omit research articles that do not have the term “marketing” or “AI” on their titles, or articles that are in another language. Articles that

are not in the chosen database could be omitted. Conference proceedings are also not included in this study even though they might contain more current or even active research initiatives given their distinct filtering methods and analysing procedures. Thus, the scope of this review is constrained.

In-depth journals, peer-reviewed conference proceedings, and other reliable databases may be added to the search scope in subsequent evaluations. Additional search terms like certain artificial intelligence technologies such as virtual reality or their marketing applications may provide better pertinent results. Artificial intelligence in marketing studies that do not involve human subjects or concentrate on developing models and applications, such as those in this study, must be carefully distinguished from research that includes teachers, students, or other human participants.

Artificial intelligence in marketing intersects with a few newly developing subfields as an interdisciplinary field, including machine learning, hardware manufacturing, e-commerce, and recommendation systems. Future studies could choose other disciplines and investigate how artificial intelligence technologies are utilised in their marketing, which can be a subfield of artificial intelligence in marketing. Researchers could also use a different online scientific literature database and different filtering methods to choose the target articles. They may also decide to look beyond peer-reviewed journal articles and into conference proceedings. Future evaluations may also focus on specific AI technologies used in the marketing field due to the integrations of new cutting-edge technologies like machine learning and virtual reality.

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