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An Empirical Study on Artificial Intelligence in Marketing

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ABSTRACT: Disruptive technologies such as the internet of things, big data analytics, blockchain, and artificial intelligence have changed the ways businesses operate. Of all the disruptive technologies, artificial intelligence (AI) is the latest technological disruptor and holds immense marketing transformation potential. Practitioners worldwide are trying to figure out the best fit AI solutions for their marketing functions. However, a systematic literature review can highlight the importance of artificial intelligence (AI) in marketing and chart future research directions. The present study aims to offer a comprehensive review of AI in marketing using bibliometric, conceptual and intellectual network analysis of extant literature published between 1982 and 2020.

I. INTRODUCTION

Technological disruptions such as artificial intelligence (AI), internet of things (IoT), big data analytics (BDA) have offered digital solutions for attracting and maintaining the customer base. Emerging technologies provide a competitive advantage by facilitating the customers' product and service offerings. In the current business scenario, the cut-throat competition and technological disruptions have changed the way organizations operate.

Globally customer-centric approach focused on customer needs plays a pivotal role in organizational growth. Artificial intelligence (AI) is a widely used emerging technology that helps organizations track real-time data to analyse and respond swiftly to customer requirements. AI offers consumer insight on consumer behaviour essential for customer attraction and customer retention. AI incites the customer's next move and redefines the overall experience.

AI tools are useful to deduce customer expectations and navigate the future path.

Artificial Intelligence find its applications in different context in today's business scenario. Practitioners and academicians believe that Artificial Intelligence is the future of our society. With the advancement of technology, the world has become a web of interconnected networks. The technology implementation led to investment in Artificial Intelligence (AI) for big data analytics to generate market intelligence. Artificial Intelligence applications are not limited to only marketing; rather, it is widely used in other sectors such as medical, e-commerce business, education, law, and manufacturing.

AI is continuously getting implemented to benefit many different industries. However, the implementation of AI in all sectors has not been possible due to many constraints, but scientists are working on systems that cater to the theory of mind and self-awareness of the artificially intelligent systems.

Nowadays the people interact with some form of AI in daily activities. For example, the user enjoys the automatic e-mail filtering feature. In the smartphone, the user may probably fill out a calendar with Siri, Cortana, or Bixby. The user of the new vehicle gets assisted by AI while driving. Artificial Intelligence can automate the business process, learn insights from past data, and generate consumer and market insights through the program-based algorithm. Technologies like Machine Learning (ML), Deep Learning, and Natural Language Processing (NLP) train machines to handle big data for the generation of market intelligence. As the adoption of AI in marketing is in nascent stages, there is a dearth of systematic literature review exhibiting the in-depth research pattern in the AI-driven consumer market and lead to research question like: What are the applications of AI in Marketing?

II. LITERATURE REVIEW

Unlike human intelligence, artificial intelligence (AI) is the intelligence demonstrated by the machines. A system of intelligent agent machines that perceives the environment to successfully achieve its goal represent the artificial intelligence. According to Russel and Norvig (2016), artificial intelligence describes machines (computers) that simulate cognitive and affective functions of human mind.

The development of Artificial intelligence is phenomenal and experts have worked tirelessly to advance AI concepts over the few decades. The work led to some major innovations like big data analytics and machine learning applications in myriad sectors and context.

The term Artificial Intelligent generally leads people to think only about automated robots who work for humans because the people have only seen the human-machine interaction in the movies or any shows through robots only. Artificial Intelligence applies to any kind the machine that needs to think like a human resulting in continuous learning and problem-solving. These are the features of AI that make it unique. Sometimes people find a task boring or dull, which is repetitive. However, with the help of a machine, people never have to experience a similar job as boring. An artificially intelligent system does repetitive jobs for humans continuously.

Data ingestion is a very important feature of artificial intelligence. Artificially intelligent systems work with huge amounts of data. The artificial intelligence system collects data according to requirement and analyse the huge chunks of data. There is a huge amount of data that organizations like google, amazon handle & that is impossible to analyse by humans. Also, an artificially intelligent system stores multiple information about multiple people, multiple machines from multiple sources. All of this appears on the system asynchronously or simultaneously.

AI-enabled systems are designed to observe and react to their surroundings. They perceive the environment and take actions accordingly and keep in mind the situations that might come up soon. For example, AI, with the help of historical data, can predict the breakdown time of a machine. It can alert us for the action beforehand.

III. USE OF ARTIFICIAL INTELLIGENCE IN MARKETING

1. USE OF ARTIFICIAL INTELLIGENCE IN STRATEGY AND PLANNING:

Artificial intelligence can support marketers in strategy and planning marketing activities by helping in segmentation, targeting, and positioning (STP). Besides STP, AI can help marketers in visioning strategic orientation of firm. Text mining and machine learning algorithms can be applied in sectors like banking and finance, art marketing, retail and tourism for identification of profitable customer segments.

A combination of data optimization techniques, machine learning and causal forests can narrow down the targeted customers also.

2. USE OF ARTIFICIAL INTELLIGENCE IN PRODUCT MANAGEMENT:

Artificial intelligence-based marketing analytics tool can gauge the suitability of product design to the customer needs and resultant customer satisfaction. Topic modelling adds to the system capabilities to service innovation and designs. Preference weight assigned to product attributes during product search help the marketers to understand product recommender system and align marketing strategies for meaningful product management. Deep learning can personalize the point of interest recommendation and helps to explore new places. Artificial intelligence offers capabilities to customize offerings to suit to the customer needs.

3. USE OF ARTIFICIAL INTELLIGENCE IN PRICING MANAGEMENT:

Pricing involves factoring of multiple aspects in finalization of price and it is a calculation intensive job. Real time price variation based on fluctuating demand adds to the complexity of pricing task. Artificial intelligence based multiarmed bandit algorithm can dynamically adjust price in real time scenario. In the frequently changing pricing



scenario like e-commerce portal, Bayesian inference in machine learning algorithm can quickly adjust the price points to match the competitor's price.

4. USE OF ARTIFICIAL INTELLIGENCE IN PLACE MANAGEMENT:

Product access and product availability are essential component of marketing mix for heightened customer satisfaction. Product distribution relies on networked relationship, logistics, inventory management, warehousing and transportation problems, which is largely mechanical and repetitive in nature. Artificial intelligence is the perfect solution in the case of place management by offering cobots for packaging, drones for delivery, IoT for order tracking and order refilling. Standardization and mechanization of distribution process adds convenience to both suppliers and customers. Besides utility in distribution management, AI also offers customer engagement opportunities in service context.

5. USE OF ARTIFICIAL INTELLIGENCE IN PROMOTION MANAGEMENT:

Promotion management entail media planning, media scheduling, advertising campaign management, search engine optimization etc. Promotion tactics are transforming from physical to phygital. Digital marketing and social media campaigns made an inroad due to digital transformation across the globe. In the changed technological world, customer decide the content, place, and timing. AI offers personalization and customization of message as per the customer profile and likings. Content analytics can optimize value and message effectiveness.

IV. METHODOLOGY

We used Rowley and Slack's guidelines for conducting the literature review. Methodologically, the literature review used a five-stage process described in the following sections.

1. Selection of bibliometric data bases.
2. Defining key words
3. Refining the initial results (inclusion and exclusion criteria)
4. Data analysis plan
5. Identification of research gaps and future research directions



FINDINGS

Author(s)	Study based on	Findings
Gacanin and Wagner (2019)	Autonomous CEM	Establishment of critical business drivers through AI and ML
Nguyen and Sidorova (2018)	Enhancement of customer experience through AI	Customer experience enhanced through AI-driven chatbot
Maxwell et al. (2011)	Data processing through AI and ML algorithm	Correct the marketing decision made through AI and ML algorithm-based data processing
Chatterjee et al. (2019)	Application of AI in marketing	Based on the AI application analysis of customer habits, purchases
Seranmadevi & Kumar (2019)	AIUI in CRM	CRM functions evolution through AIUI
Sujata et al., (2019)	Smart Retail stores	Customer experience enhancement, world-class SCM through a smart retail store
Sha and Rajeswari (2019)	Advanced AI in e-commerce	Advanced AI-enabled machine could be able to track five human senses and improved e-commerce business

V. FUTURE RESEARCH DIRECTIONS

Semantic knowledge and machine learning for deeper consumer insights will offer future researchers new strategic imperatives. Psychologically driven and brain-inspired reasoning algorithms would further improve the predictability of consumer behaviour. Psychological theories addressing the cognitive and affective needs of consumers ensembled with engineering tools will help design intelligent sentiment mining systems. Hybrid machine learning techniques will help in better sentiment classification in the future. Optimization models based on existing marketing theories will boost the applicability of AI in marketing.

VI. CONCLUSION

It is no longer a debate that companies who provides great customer experiences will be winners in the Fourth Industrial Revolution — where intelligence will reign supreme. The Fourth Industrial Revolution has been conceptualizing the



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company to have integrated data about customers and products across all channels and products, using that data to understand better its end customer experience and visibility across all functional areas.

In this context, AI and ML have played a crucial role in big data analytics to anticipate and provide guided experiences to meet customer expectations. Through this research, the authors provided a holistic view of using AI to enhance customer experience. Leveraging AI and predictive analytics is the key to offering customer experiences that builds advocacy and customers for life. Event-based architectures combined with AI and predictive analytics is the future. There is no end state, but it is a journey all companies must begin as we enter the Fourth Industrial Revolution.

Disruptive technologies such as internet of things, big data analytics, blockchain, and artificial intelligence have changed the ways businesses operate. Of all the disruptive technologies, artificial intelligence (AI) is the latest technological disruptor and holds immense potential for manufacturing, pharmaceuticals, healthcare, agriculture, logistics, and digital marketing. Many practitioners and academicians worldwide are trying to figure out the best fit AI solutions that their organizations can utilize. However, there is a lack of bibliometric reporting that exhibit detailed research pattern of AI in marketing.

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