

# **Artificial Intelligence**

## **Review Report of Research Papers**

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# Introduction

“If you’re in marketing, AI is a powerful ally. If you’re in data science, marketing is a rich problem set ” .

Integration of technology into the business context is one of the centuries old marvel, where the difference is defined in terms of innovations and processes improvements. In recent years, Artificial Intelligence (AI) has turned out to be an emerging trend in diverse fields: business, education, science, medicine and automotive. AI has also been integrated into marketing and such integrations have become a fast-growing trend which guarantees the competitive advantage in the business context. In order to execute AI in marketing strategy, companies have redefined their marketing mix with AI. Empirical studies are found explaining how AI leverage the marketing mix with the presence of extensive data by encouraging business intelligence decision making related to future business processes, consumer behaviour, and market trends which leads to promote decision making, which creates businesses a competitive edge over its rivals.

We are on the verge of the need for autonomic responses just to stay afloat. Personalization, recommendations, dynamic content selection, and dynamic display styles are all going to be table stakes.

Let’s start with a super-simple comparison between artificial intelligence and machine learning from Avinash Kaushik, digital marketing evangelist at Google: “AI is an intelligent machine and ML is the ability to learn without being explicitly programmed.” Artificial intelligence is a machine pretending to be a human. Machine learning is a machine pretending to be a statistical programmer. Managing either one requires a data scientist.

We argue that the marketing discipline should take a lead role in addressing these questions, because arguably it has the most to gain from AI. In an analysis of more than 400 AI use cases, across 19 industries and 9 business functions, McKinsey & Co. indicates that the greatest potential value of AI pertains to

domains related to marketing and sales , through impacts on marketing activities such as next-best offers to customers , programmatic buying of digital ads and predictive lead scoring .

## **Problem Statement**

The Artificial intelligence (AI) has its application in different processes in business within various functional areas and business functions. One of them is marketing, which is considered as the core of the business. The Artificial intelligence (AI) is changing the landscape of marketing and will completely transform in near future. Although marketing is the major business applications within AI today and early adopters are attempting to create value from it ,the literature on this aspect are scarce where both of the disciplines are combined . Wierenga (2010) also pointed out there are not a sufficient publication for AI in marketing and marketing in AI literature. According to Martínez-López&Casillas (2013), it has been reported that Scopus had less than 50 articles related to marketing and AI in business related journals. After that, the research related to the topic in Scopus has increased but it is still under 100.Martínez-López&Casillas (2013) stated that there is a need of more studies that show the impact of AI on marketing considering that there is a scarcity of the research in the literature and the potential of the combination in making marketing decisions.

# Research Paper - 1

## Artificial intelligence in marketing: Systematic review and future research direction

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### **Problem Statement**

Together with the brief including the empirical highlights on knowledge requirements in the field of AI, this paper attempts to review the importance of AI with regard to marketing mix. Though the significance of AI has been referred in relation to many business and organizational contexts, enough empirical studies are yet to be identified and is limited even within the marketing context . While many researches tend to focus on the particular area of AI in business, there is only a few academics whose interest has flickered in relation to AI from a marketing perspective . Apart from that, most of the marketing managers have confidence in AI as a revolutionizing potential while, many are still unaware of the extent of the benefits or not sure how they can adopt AI to improve marketing . Thus, this paper seeks to address a contribution to the literature on AI and, in particular, the phenomenon of the importance of AI in marketing mix. Furthermore, AI contributes, both theoretically and practically to marketing decision making, and this importance has only been realized to a very limited context, hence the authors attempts to make a contribution by taking a closer look at the opportunities for AI in marketing, considering the achievements so far, and by addressing the potential perspectives for the future.

In addition to that, the researchers argues that AI needs to be empirically discussed related to different marketing theories and contexts, in order to unveil its real influence. Therefore, the authors attempts to explore how AI has been found in empirical studies linked to different marketing contexts. Furthermore, this paper contributes to prevailing knowledge as a conceptual review to

synthesize the role of AI in marketing mix in the current and future context, where it will be researched and claimed in future research directions.

## Technique

“All human actions are based on anticipated futures. We cannot know the future because it does not exist yet, but we can use our current knowledge to imagine futures and make them happen. The better we understand the present and the history that has created it, the better we can understand the possibilities of the future”. Most businesses are taking benefit of online communication, electronic data-processing analyses, and information-retrieval systems as tools that help marketing to be more efficient and effective. This has led to the emergence of real-time marketing. The use of AI enables 3 important dimensions, such as marketing tasks automation, accuracy improvement, and human efforts reduction.

The paper narrated how the intelligence network and critical business value driver were established through AI and ML. Customer experience improved through AI-driven chatbot with Natural Language Processing (NLP). AI and ML algorithms enabled efficient data processing, which allows us to formulate the correct decision. Customer Relationship Management (CRM) functions benefited through Artificial Intelligence User Interface (AIUI). AI and IoT converted traditional retail stores to smart retail stores. The smart retail stores elevated customer experience and ease of shopping, and better supply chain.

Three main directions on how AI can be implemented in marketing are Data-Driven marketing, Personalised and Multichannel marketing .

Data Driven Marketing – related to big data analysis with AI to understand the consumer personality, implement and optimise the on going marketing campaigns. Competitors’ analysis, screening their activities online, and creating the competitive offering are possible with AI intelligence tools; one example is the Cortex platform.

Personalised Marketing is associated with content customisation, suggesting an optimal time for interaction and matching the correct customer profile

For instance, AI tools like Socialbakers and OneSpot tools for emails and websites content personalisation and individualisation, personal mobile assistants like Siri and Alexa, travel planning with Mezi. Music; Spotify and Pandora, service delivery with Uber and Bolt, face recognition with Haytack, language translation Liv, smart home solutions by Nest, financial planning using Olivia, and much more AI tools have become concurrent part of our lives.

Multichannel Marketing is about how to create, optimise, and monitor multichannel marketing campaigns, deliver a single strategy across different channels and platforms, to maximise the ability to reach potential and existing customers. Some of the related AI tools for a multichannel approach, which can be adopted at organisations are the following: SEO management and content research with MarketMuse, Netbase for social media listening, and brand conversations. Exceed.ai to qualify the leads and improve communication between marketing and sales, Node and Xinoah to recognise potential clients and help to pursue to buy products and services. Curata to promote the content across the online channels, Chorus AI platform for call recording and conversational tracking analysis, Aivo for voice and chat interactions with customers, and many more.

## **Methodology**

The existing literature review was giving an opportunity to summarize and present AI impact on marketing. However, most studies focus specifically on AI technology, Big Data, Marketing, AI impact on Social Media, AI and Marketing, Personalisation, some predictions for the future. There is no general overview of AI tools and trends for marketing, which would focus on its strategic usage, as well as its contribution to solutions of issues in marketing activities. Marketers need a better understanding of AI and how to adapt it to their strategies, as well as daily business routines.

The present systematic literature Rowley and Slack's (2004) guidelines for conducting the literature review. Methodologically, the literature review used a five-stage process described in the following sections. Comprehensive review protocols helped in the identification of research themes and future research directions.

### *1. Selection of bibliometric databases*

Scopus and Web of Science (WoS) are the two most reputed bibliometric databases preferred for data collection. According to Yong-Hak (2013), Scopus includes more than 20,000 peer-reviewed journals from different publishers .

## *2. Defining keywords (search strategy)*

The initial search string included words like “marketing ”and “artificial intelligence. ”Synonyms used for artificial intelligence like machine learning, deep learning, natural language processing, etc., are used with boolean operators like “OR ”to get the universal set of papers. Boolean operator “AND ”is used to get the intersection set of paper covering marketing and artificial intelligence.

## *3. Refining the initial results .*

To achieve the research objective, the search results limits to only articles published in journals as they represent “certified knowledge ”.

## *4. Data analysis plan*

The bibliometric analysis of data was carried out using R-software for performance analysis of scientific actors like most relevant authors and most relevant sources. Two researchers analyzed the Scopus data for inter rater validity.

## *5. Identification of research gaps and future research directions*

An in-depth review of research papers in each theme offered research gap insights and helped chart future research directions. Research gaps are translated into research questions that future researchers can embark on to solve.

# **Conclusion**

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.

The era of AI has approached the world offering a bundle of benefits to businesses, marketers, consumers, and to the society at large. As a result,

traditional marketing practices have been integrated with AI enabling companies to reduce process times and engage with individual consumers at scale by simplifying marketers' ability to create and distribute a great value to the right people at the right time in the right way . Moreover, AI has automated repetitive tasks allowing marketers to provide their fullest contribution to value generating activities which lead to generate a good consumer experience .

The author was able to identify a package of benefits to customers including a 24/7 customer service, automated recommendations and purchases, hyper personalized solutions, one to one marketing, and convenient shopping and many more new dimensions in the field of marketing.

The utilization of AI is growing promptly, dynamically changing and progressively developing in the business and marketing platforms and there is only a limited number of studies carried out on application of AI in marketing mix. Therefore, to fill the literature gap more research studies, conceptual frameworks, articles need to be carried out on this regard. Alongside, we also denote future research directions to be investigated extensively as to how AI influences the marketing mix strategies and decision making process in different markets. The author encourages such studies to focus on different AI mechanisms related to demographic and customer cognitive factors. More studies need to be carried out on maintaining innovativeness in strategic marketing decision-making related to 4Ps and planning in an AI-driven world. Conclusively, the author emphasises the knowledge required on examining effectiveness of AI and machine learning as a strategy in developing marketing and branding with reference to different industries.



# Research Paper – 2

## Artificial Intelligence Applied to Digital Marketing

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### **Problem Statement**

This is a study conducted in the field of digital marketing with the usage of AI, the aim of the study was to find the impact that AI currently has on digital marketing and what it could look like in the future. An analysis of interviews with 15 experts from different industries that work or have been working in the marketing industry and have used or are using AI in daily work. After the interviews were analysed with a thematic analysis were the author tried to find similarities around the data and puzzle them together for information on how AI has impacted the digital marketing industry.

Artificial Intelligence is integrated into our lives, although many people are unaware of its presence. This misconception is evident from the fact that only 50% of responses from the PRNewswire (2018) consumer awareness study state that they have never interacted with AI technologies and 23% are unsure whether they have ever interacted with AI. technology. There are many examples of AI that operate in the background of most modern technologies (smartphones, computers, smart TV's, etc.) revealing an apparent lack of knowledge about what consumers think AI is and how AI is applied daily.

### **Technique**

The largest use of AI in Marketing is through machine learning. The Artificial Intelligence component of a software product should be able to make it able to learn to improve itself permanently. Machine Learning is dedicated to, providing software with the ability to learn; this goal can be achieved by using algorithms that identify patterns in the data received and, depending on them, the software system makes decisions or predictions.

Analyzing the respondents' answers, the main uses of AI are the predictive models, clustering and recommendation systems. Predictive models are used to predict and anticipate consumer movements and behaviours along the stages of the customer journey, to lower dropout rates, identify factors of customer dissatisfaction, manage best customers, and prioritize business.

Clustering models use unsupervised algorithms to do segmentation, that is, they calculate how much one client looks like another and put them in the same cluster if there are similarities. These models improve the customer attraction process – they automate the process, identify audiences and similar targets, and enable marketing to spend to be optimized by segmenting, predicting, and identifying segments more efficiently.

## **Data Mining**

“WEKA is a data mining tool that performs data analysis and produces the results needed to achieve efficient marketing.”

Data mining is something companies are using to pursue more impactful advantages against others. Simply put mining can be divided into two separate categories that are called descriptive and predictive. Combining various ML algorithms make up the system behind WEKA, it is used with four interfaces that all have a different purpose, and it also supports various formats with the files.

## **Text Mining**

Text mining occupies a prominent position in a few research fields. On the web, just 20% of the information is organized, and the remaining 80% is unstructured information.

In general, the information you can gain through text mining has been of high value. Simply put the goal is to create value through fetching data that could be used to improve the current strategy. This is composed of examining information as well as finding the essential data patterns. Consumers write about various matters online, one being feedback for a company's products or services. Text mining can therefore be used to arrange it into a more sophisticated model so it is easier to analyse it can eventually be used to perfect the marketing strategy. This is what we call text mining, and it is also completed by mining algorithms.

# Methodology

Research method for this paper is qualitative, because of the semi-structured interviews with open ended answers. The literature review provides a comprehensive analysis of the concept and material to build a theoretical framework around Artificial Intelligence and Digital Marketing. For a thorough basis on the information needed to complete the research question, the author conducted interviews with different personalities that have knowledge about the field of marketing with implementation of AI.

The definition for, primary data is data that has been created by the author for the thesis. Secondary data is fetched and collected from various databases and sources from the internet or books, that has already been published or written by someone else.

In this paper, secondary data in the literature review was collected from the most recent published articles and from well known, books by credited authors. The primary data was collected using qualitative research methods. The results of the research and discussion conclude the findings from both data sources.

Secondary consists of the basic understanding of AI, different levels, and concepts. Furthermore, the digital marketing part goes in on how companies are using different methods in marketing with AI implemented.

For Data analysis, Thematic analysis has been used.

Thematic content analysis, by definition, is a popular method for analysing qualitative data in many disciplines and fields, and can be applied in lots of different ways, to lots of different datasets, to address different research questions!

It is one of a cluster of methods that focus on identifying patterned meaning across a dataset.

## **Result**

From the data obtained from both the consulted studies and the interviews carried out within the context of this work, it is concluded that AI will eventually gain a bigger portion of the job if it has not done it already. This did create some thoughts with the participants. Humans will still have the final decision for now.

Something that the AI still lacks is creativity and this seemed to be a common opinion around the experts. We might see something being done on the creative side in the future but for now humans are still needed regarding it. The AI can suggest the products better and it can also predict various matters better than a human can right now. This is something that I personally think companies should really invest their time on if they have use for these features.

Finally, firms need to develop realistic expectations, because “ in the short run, AI will provide evolutionary benefits; in the long run, it is likely to be revolutionary ”. That is, the benefits of AI could be overestimated in the short term but underestimated in the long term, a point (sometimes called Amara’s Law) in accordance with Gartner’s hype cycle model of how new technologies evolve.

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## **Comparison and Outcome from both the paper :**

After reviewing both the papers , it is observed that the greatest impact on the potential value of AI use is in marketing and sales, supply chain management and production. Consumer industries, such as retail and high tech, tend to see more potential in AI applications in marketing and sales because frequent, digital interactions between companies and customers generate larger datasets for AI techniques. E-commerce platforms can benefit from AI because of the ease with which these platforms collect customer information, such as click data or time spent on a website page, and can customize promotions, pricing, and products for each customer dynamically and in real time.

According to Rosenberg (2018), based on the Constellation study, looking at investment in all sectors of the market, there will be an investment of over 100 billion euros per year in Artificial Intelligence in 2025, while in 2015 only 2 billion was spent. The Marketing industry will be no exception and there will be increasing investment in AI.

Consequently, it can be concluded that AI adoption improves marketing managers' performance, increases their productivity, and lift the overall marketing strategy.

## Factual Data

**21% of sales leaders rely on AI-based applications today, with the majority collaborating with marketing teams sharing these applications.** Sales leaders predict that their use of AI will increase 155% in the next two years. Sales leaders predict AI will reach critical mass by 2020 when 54% expect to be using these technologies.

**Over 41% of marketers say AI is enabling them to generate higher revenues from e-mail marketing.** They also see an over 13% improvement in click-thru rates and 7.64% improvement in open rates.

**Content personalization and predictive analytics from customer insights are the two areas CMOs most prioritize AI spending today.** The CMO study found that B2B service companies are the top user of AI for content personalization (62.2%) and B2B product companies use AI for augmented and virtual reality, facial recognition and visual search more than any other business types.

**Personalizing the overall customer journey and driving next-best offers in real-time are the two most common ways marketing leaders are using AI today, according to Salesforce.** Improving customer segmentation, improving advertising and media buying, and personalizing channel experiences are the next fastest-growing areas of AI adoption in marketing today.

## Suggestions regarding Future Research

Both the paper outlines a framework to understand how AI will impact the future of marketing, specifically to outline how AI may influence marketing strategies and customer behaviours

To examine the full scope of the impact of AI, we propose a research agenda covering three broad areas: (1) how firms' marketing strategies will change, (2) how customers' behaviours will change, and (3) issues related to data privacy, bias, and ethics. This research agenda warrants consideration by academia, firms, and policy experts, with the recognition that although AI already has had some impact on marketing, it will exert substantially more impact in the future, and so there is much still to learn.

### Ethics

Finally, AI developers must grapple with ethics; we highlight two issues. First, data privacy choices may reflect a firm's strategy (e.g., if it wants to be perceived as a trusted firm) but also could be driven by ethical concerns. In this sense, research should address "how can normative ethical theory pave the way for what organizations should be doing to exceed consumer privacy expectations, as well as to over-comply with legal mandates in order to preserve their ability to self-regulate. A related research topic might involve examining how ethical concerns about AI vary across cultures.

Second, firms choose to deploy AI by defining which problems the AI will tackle. For example, two Stanford researchers used deep neural networks to identify people's sexual orientation, merely by analysing facial images . The deep neural network tools (vs. human judges) were better able to differentiate between gay and straight men. However, the work raised ethical concerns, in that many argued that this AI-based technology may be used by spouses on their partners (if they suspected their partners were closeted), or—more frighteningly—may be used by certain governments to "out" and then prosecute certain populations. An important topic for research thus is to address upfront the types of applications for which AI should be used for .

We also propose an agenda for future research, in which we delineate how AI may affect marketing strategies and customer behaviours. In so doing, we

respond to mounting calls that AI be studied not only by those in computer science, but also studied by those who can integrate and incorporate insights from psychology, economics and other social sciences.

## Conclusion

Artificial Intelligence (AI) is rapidly becoming more central to the day-to-day digital world, and the marketing and advertising world is no exception. From sarcastic and brilliant Siri to Tesla's self-driving cars to Google AI that can learn video games in mere hours, Artificial Intelligence is revolutionizing industries one by one. The applications of Artificial Intelligence range from detecting trends in data to mitigate market risks, enhancing customer service through virtual personal assistants, or even analysing millions of documents across a company's servers to find compliance failures. But it is only recently that companies have been able to anticipate and envision the possibilities that Artificial Intelligence and robotics can bring to the future of the business world. Artificial Intelligence leverages self-learning systems by using tools like data mining, pattern recognition and natural language processing. So, in terms of its key business advantages over human intelligence, Artificial Intelligence is highly scalable, resulting in phenomenal cost savings.

Like every other domain, marketing has also been significantly influenced by the introduction of new technologies and this effect will majorly grow in the upcoming years. It is evident that AI has boosted the performance of marketing in different ways. In the near future, it is expected that AI will boost the impact, for e.g. Robots will be used as a substitute of sales people, websites will be updated and reformatted automatically by eye-tracking data.

Undoubtedly, the research on marketing will be shifted and become insignificant as the new trends in marketing will emerge due to the AI. The field of marketing is and will be changing rapidly with the changes and advancement in AI. The pace of this change will also transform the overall landscape of marketing in academics, research, and business context.

## Reference

1. Artificial intelligence in marketing: Systematic review and future research direction : [Artificial intelligence in marketing: Systematic review and future research direction - ScienceDirect](#)
2. Artificial Intelligence Applied to Digital Marketing :  
[https://link.springer.com/chapter/10.1007/978-3-030-45691-7\\_15](https://link.springer.com/chapter/10.1007/978-3-030-45691-7_15)
3. A strategic framework for artificial intelligence in marketing :  
<https://link.springer.com/article/10.1007/s11747-020-00749-9>
4. Role of Artificial Intelligence in Business Transformation :  
[https://www.researchgate.net/publication/345304894\\_ROLE\\_OF\\_ARTIFICIAL\\_INTELLIGENCE\\_IN\\_BUSINESS\\_TRANSFORMATION](https://www.researchgate.net/publication/345304894_ROLE_OF_ARTIFICIAL_INTELLIGENCE_IN_BUSINESS_TRANSFORMATION)
5. How artificial intelligence will change the future of marketing :  
<https://link.springer.com/article/10.1007/s11747-019-00696-0>
6. Application of Artificial Intelligence in Marketing Mix: A Conceptual Review [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3862936](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3862936)