

The Role of Artificial Intelligence Application in Strategic Marketing Decision-making Process

Aram H. Massoudi, Sahar J. Fatah, Mohammed S. Jami

Department of Business Administration, Cihan University-Erbil,
Kurdistan Region, Iraq

Abstract—This review article examines artificial intelligence (AI)’s role in strategic marketing decision-making. The researchers interviewed experts with experience in decision-making and used Carrefour Iraq as a case study to identify themes on how humans use AI for better strategic marketing decision-making. The key themes in this review were factors such as big data, efficiency, quality, trust, and limitations for prediction. The study has also looked into the marketing aspect of these themes within the scope of this research. The findings indicate that AI is recognized as a tool that may support humans in making strategic decisions in marketing. However, AI can technically make such decisions without human intervention; people do not want to give AI-complete autonomy in decision-making. Furthermore, the result implies that rather than making decisions independently, AI is more frequently applied to enhance strategic decision-making. It suggests that AI aims to improve decision-making rather than supplant people in daily life. In addition, the study makes the case that AI can assist humans in making better decisions by forecasting future scenarios that consider a particular action consequence.

Keywords—Artificial intelligence, Big data, Marketing decision, Marketing, Strategic decision-making.

I. INTRODUCTION

AI is any human-like intelligence displayed by a computer, robot, or other machine. Artificial intelligence (AI) also refers to a machine’s capacity to mimic the abilities of the human mind, including learning from examples and experience, understanding and responding to spoken language, making decisions, solving problems, and combining these abilities with other ones to perform tasks that a human might carry out, like operating a vehicle. AI is the “science of making machines intelligence (smart),” according to Demis Hassabis, CEO of Alphabet Inc., owned Deepmind. Systems are being created with human intelligence in mind, including our capacity for reasoning, meaning discovery, and generalization or learning from prior experience. AI is defined as intelligent machines that operate as a human brain that is designed scientifically, brilliant computer programs,” in the words of John McCarthy, the father of AI. Forbes claims that top-performing businesses are far more likely to use AI in marketing (28% vs. 12%). Recent radical advancements in technology have led to the adoption of digital systems, which have altered our way of doing things. Based on the survey conducted by Accenture and Microsoft, there is anticipated from 84% of the marketing industry that AI

will improve workflow within the next 3 years, impacting marketing positively (IMM Graduate school, 2022).

In addition, by 2023, investment in marketing automation will total \$25 billion worldwide (IMM Graduate School, 2022). One thousand eight hundred and forty-three organizations were questioned by the McKinsey Group online on their use of AI, and 1013 stated that their companies had implemented AI in at least one task (McKinsey Group, 2021). Technology breakthroughs and the abundance of consumer data at businesses’ disposal have made AI crucial for companies to stay competitive, therefore, advancing the marketing innovation and performance by firms (Massoudi and Fatah, 2021). This study examines how AI helps marketers make better strategic decisions. The research problem highlights that marketers often need help strategically using machine learning to process big data in making predictions, such as AI. This study’s objective is to understand the concept and role of AI in strategic decision marketing. The study must establish the following objectives to achieve the above-stated aim. These objectives will help to explore the ideas related to AI with more detail and precision.

The sole aim of the study is to understand the concept and role of AI in strategic decision-making, and how is AI being used to make better strategic marketing decisions.

II. LITERATURE REVIEW

AI is more efficient and trustworthy than humans in discovering big data patterns (Kraus, 2020). Moreover, Shrestha et al.'s (2019) study found that when AI and human strengths are combined in the best possible way, it leads to better organizational decision-making. This essay lays the groundwork for appreciating the potential benefits of a collaborative effort between people and computers in decision-making (Shrestha et al., 2019). Integrating AI-based decisions into an organization has been seen as beneficial since it offers increasing openness (Shrestha et al., 2019). Because both humans and AI have the potential to be very effective in the realm of organizational decision-making, Jarrahi (2018) investigates the methods in which they might best work together. Due to this, if AI includes consumers or workers in the decision-making process, it may be better viewed as decision support in a strategic framework (Borges et al., 2021; Giuggioli and Pellegrini, 2022).

The supporter role of AI, as described by Duan et al. (2019), consists of assisting users in making more informed decisions. One reason is that AI can aid in reaching a group decision. By illustration, AI can see patterns in data and understand how they relate to one another (Giuggioli and Pellegrini, 2022). Over the years, the emphasis on AI in business has shifted from an operational perspective to a strategic one due to advancements in the technology sector (Davenport et al., 2020). The study of Davenport et al. and Eriksson et al. (2020) found that the capability of AI learns from historical data to automate the corporate process to provide customer and market insights stems from the machine program. The study undertaken by Huang and Rust (2021) is very pertinent since it conceptualizes AI technology in three intelligence domains. The original breakthrough, given the name "Mechanical AI," can automate a variety of marketing chores, including clustering strategies and recognizing patterns to segment and classify customers (Huang and Rust, 2021). The second is that "Thinking AI" analyses the data, draws new conclusions, and presents them (Huang and Rust, 2021).

The AI platform incorporates state-of-the-art neural and machine learning (Lida, 2020). AI might guide decision-makers in choosing the best target marketing. According to a study by Huang and Rust (2021), AI may help formulate promotional plans. AI was created to help people connect while learning more about their emotions and feelings. The tools have the potential to improve key marketing decisions, including segmentation, targeting, and positioning, in addition to the "4 Ps of Marketing" (product, pricing, promotion, and placement) (Massoudi, 2020). The fact that the fourth industrial revolution lies in the driving force of AI technology has raised several sensitive issues (Schwab, 2017). Since people tend to form opinions about one another based on their looks, it might be challenging for AI, built from various algorithms and programs, to avoid being stereotyped (Cho and Hu, 2009; Duarte et al., 2012). Contemplating trust inevitably leads one to conclude that it entails exposing one's weak spots to another person. However, AI's visage is not that of a human (Mayer et al., 1995).

Over the past few years, AI has also developed a reputation as a technology that can replace humans (Davis, 2019). It is interesting to see that trust tends to increase rapidly. There is frequently a direct correlation between the amount of data and expertise provided to a robot or algorithm and the degree of accuracy with which judgments are made (Glikson et al., 2020). According to research by Gombolay et al. (2015), when two teams of people were working on a project, one was managed by a robot and the other by a human, and surprisingly, the robot received higher trust when it came to task scheduling and other purportedly "logistical" activities. Consequently, the level of planning and programming required for a task may be related to how much trust others (Massoudi 2022).

AI will create new commercial prospects in digital marketing (Kolbjrnrsrud et al., 2016). Businesses must use AI in marketing to stay competitive (Pradeep et al., 2019). This thesis examines automation and AI in marketing, especially digital marketing. Digital marketing's popularity affected this decision. Considering AI's pervasiveness and the industry's dynamic nature, the focus is on studying its effect on digital marketing.

A. Conceptual Framework

For this paper, the conceptual framework is based on the Model by Colson (2019), which mentioned that AI-based decision-making processes require human involvement with non-digital data (Colson, 2019). The Colson model has been selected as a framework to use big data for better business decisions using AI to support human decision-making in predicting the future. Fig. 1 depicts the Colson model that integrates the power of human judgment and AI.

The method is illustrated in more detail: The AI algorithm is input with big data. The information is then run through this algorithm, which has been personalized to the user's needs and preferences, to get a possible action conclusion. The human accepts the machine's potential actions and evaluates them using its additional, non-digital information (Miyamoto et al., 2021). The final phase, which involves connecting the non-digital information, will be completed by humans based on their assessment of the potential action (Fernandes et al., 2021). An AI-based business decision can be made (Colson, 2019). This model has drawbacks because it does not consider deep learning variables or adjustments to the AI algorithms, which are frequently difficult for individuals to make and may need to be altered (Lebovitz et al., 2021). AI uses human support to create a business decision instead of machine one (Colson, 2019). To fill the gap in the literature review of Borges et al., (2021) on how AI can contribute to a strategic decision-making process. Furthermore, there is a need for more study on AI in marketing strategic decision-making (Stone, 2020).

III. RESEARCH METHODOLOGY

This study employs a qualitative method approach to understand AI as a concept and its role in strategic marketing

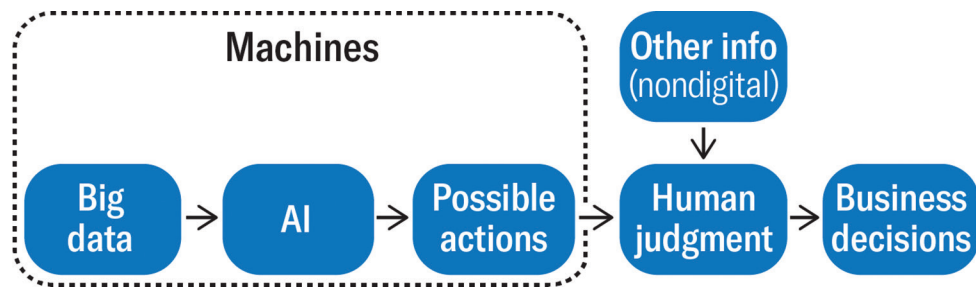


Fig. 1: A decision-making model that combines the power of AI and human judgment. Source: Colson (2019).

and decision-making. The qualitative research study is built on a multiple case study technique to investigate experts' opinions on using AI in strategic marketing decision-making (Yin, 2018). Qualitative research has been used to gather data and information needed to formulate an explanation and respond to the research question (Halkias and Neubert, 2020). To understand the similarities and differences between each theme, a study involving ten expert interviews and ten participants is analyzed (Yin, 2018). In addition, a case study's data and dependability can support and corroborate the theoretical viewpoint (Halkias and Neubert, 2020). That is, it will be determined how AI may improve competitive intelligence for strategic marketing decision-making by analyzing the views and perceptions of interviewed experts. Data were collected using purposive sampling of ten expert participants from the Carrefour retail company in Iraq (Merriam and Tisdell, 2016). The data were obtained after expert interviews with experience with strategic decision-making processes in the marketing department and AI. A master's degree or above and experience in AI in decision-making processes are requirements for inclusion as experts (participants) in data collection.

IV. RESULTS AND FINDINGS

A. AI and Big Data Analysis in Decision-making

AI employs comprehensive data analysis to forecast and advocate. AI can assist humans in making a more accurate decision based on something expected to happen or will happen in the future. This shows how big data is used to make a demand analysis. Amazon, for example, has been using big data to understand its customers better (Li and Zhang, 2021). The trend that can be seen is employing AI to forecast scenarios more correctly. For example, AI technology enables businesses to predict brand perform better and understand clients' wants. This was also true in a detailed review of social media that looked at how many aspects have improved over time thanks to big data and machine learning. Real-time interaction analysis, accurate client targeting, and result prediction are some of these elements (Chaudhary et al., 2021). The interviewed participants claim that by forecasting demand for manufacturing and delivery, AI may assist supply chain management in allowing just-in-time deliveries. Since AI has become more prevalent, this has also been reflected in the Iraq retail market. A retail company like Carrefour can apply big data and AI technologies to determine the market's

direction Li et al. (2016). It is possible to forecast client behavior and preferences as well as preferred sales channels. Only after a substantial amount of data relevant to this issue has been analyzed can a credible conclusion based on specific facts be reached. As a result, the algorithm needs many data to come to reasonable conclusions. The topic might provide a solution to the research issue by connecting it to its related research question. AI may help with strategic decision-making since it boosts decision quality and efficiency (Dubey et al., 2019). However, deploying AI to assist humans in decision-making necessitates a certain amount of faith in the technology (Davenport et al., 2020). The pattern indicates that AI uses big data analysis to create forecasts (Abarca-Alvarez et al., 2018).

B. AI and Efficiency in Decision-making

According to experts interviewed in Carrefour retail, AI may improve decision-making efficiency by either assisting the process by suggesting appropriate action suggestions or scenarios or making a choice (Agrawal et al., 2017). AI speeds up decision-making and allows the processing of large amounts of unstructured data (Kaput, 2018). AI outputs can also help with strategic decisions that present alternatives or visually represent possibilities (Borges, 2021). Furthermore, because big data can be analyzed concurrently, AI can save time and make judgments more effectively (Taylor, 2021). Thus, it has been established that AI can help people make wiser judgments. AI is less about replacing people than enhancing human talents and making complicated judgments (Davenport et al., 2019). The potential of big data analysis will also be an essential part of how businesses stay competitive. Nowadays, enterprises outsource AI services to streamline their data analysis procedures. Shifting manual operations to AI technologies enables businesses to save time and money (Agrawal et al., 2017). Other studies suggested that using objective programming to help in decision-making (Al-Salami, 2019). Furthermore, it help for better quality in decision-making (Jami, 2018).

Red Balloon, a website that sells gifts and experiences, provides a particularly intriguing situation. They were able to increase the effectiveness of their advertising efforts, reduce marketing costs by 25%, and improve results by 30% using AI in their marketing strategy (Kaput, 2018). In addition, the business has discovered new prospective buyers thanks to AI (Kaput, 2018). The cofounder of Red Balloon, Naomi, explains how the company grabbed US

and UK markets of individual travel to Australia, which she failed to understand she had (Kaput, 2018). As a result of AI, some companies have archived high brand reputation, positioning their market stand and capability to effectively monitor marketing media chatter in real-time (Kaput, 2018). In addition, PR and communications specialist Ashley Geo. As a result of incorporating AI with marketing strategy, their company with overgrowing monthly, which enables the company to differentiate between their content and predict what launch events resonate appropriately with a customer (Sokolowski, 2018).

C. AI and the Quality of the Decision-making

AI can improve the quality of decision-making by considering more facts (Borges, 2021). On the other hand, humans are limited to making decisions based on “a concentrated quantity of data.” As more factors have been assessed and considered for improved decision-making, increasing the quantity of information being examined lowers the chance of making a wrong choice (Davenport et al., 2019). AI’s potential for risk detection facilitates making more informed and precise judgments. Big data may contain an undiscovered possibility that AI can reveal. The offered data does, however, “depend on the quality of the results.” AI may drastically reduce human error rates. For instance, a large portion of today’s human workforce is dedicated to mechanical and repetitive jobs that AI technology can carry out more accurately and effectively. The quality of the decision-making process has improved in every case examined. One well-known fashion and lifestyle firm, *PrettyLittleThing*, employs AI to personalize the client experience. They detect potential clients and anticipate their product preferences using AI. This strategy guarantees that they only use their ads to reach potential clients. *PrettyLittleThing* may improve the quality of customized ads due to AI (Taylor, 2021).

Impossible foods are another start-up that has an intriguing argument. AI has helped the company make its content more unique and determine which launch events appeal most to each target market (Sokolowski, 2018). In addition, AI is used by *Deckers Brands* to streamline the product development and market entry processes for its footwear brands, *Teva* and *Hoka*. Here, AI gathers information about the intended market to inform decisions on product development. AI assists in the identification of possibilities, problems, and complexities (Taylor, n.d.). *Citrix* predicts which marketing initiatives will likely result in higher-quality deals using AI to assist people. As a result, they get insights using information such as psychographics and customer behavior (Kaput, 2021).

D. AI and the Trust in Decision-making

There must be transparency in the input data to understand the outcomes of AI’s analysis. People must comprehend how the AI develops confidence in the algorithm and responds to decisions made or actions suggested. As a result, the AI system’s openness is crucial to its dependability. The degree to which humans rely on, devote their decision-making process

to, and hold AI accountable for their decisions depends on the human race’s culture. Younger generations tend to be more objective and accustomed to utilizing computers and depending on their judgment. However, worries about data security and privacy contribute to a lack of confidence. Users must rely on recommendations or actions and “trust the algorithm’s effectiveness.” According to a participant, it is crucial to avoid giving AI systems control over decision-making because they are far from flawless and require human decision-making for every choice. The algorithm can only use the code or methods to process data. A pandemic or other unanticipated calamity might not be considered in the analysis. If insufficient data are used in AI training, a flaw may have been taught to the system. If the AI is given complete data and has enough expertise and experience, the system will not do as well as it should.

E. AI and the Limitations in Decision-making

Every scenario examined used a mixed approach of AI and human marketing teams to make decisions. Nevertheless, only one of the situations discussed revealed problems with AI’s use or limitations. *Blueyonder*, a supply chain management software firm, uses consumer information to forecast customer behavior and customize communications or offers. The creator of *Blueyonder* stated that too many unpredictable variables might frequently impact judgments. As a result, the application of AI for decision-making is constrained by lingering ambiguity (Tjepkema, 2018).

In addition, *Red Balloon* discusses the constraints of employing AI to discover new clients and trust difficulties. According to *Simson*, a cofounder of *RedBalloon*, AI is about trust, and humans tend to take charge of things independently. *Simson* also pointed out that investing enough money in AI technology is necessary for it to function. AI has high start-up costs, so start-ups cannot use it to get their businesses off the ground (Kaput, 2018). Therefore, firms need to develop successful strategies of supply chain and complement the organization’s strategy to achieve competitive advantage (Massoudi, 2018).

V. DISCUSSION

This study identified factors such as “efficiency,” “quality,” “trust,” and “big data” as themes in understanding the role of AI in the strategic marketing decision-making process. The experts’ perceptions of AI in strategic decision-making reflect these themes. These perspectives can be applied to marketing scenarios. Experts’ perceptions from *Carrefour* and authors’ literature review correlate. AI supports experts in increasing decision-making efficiency and quality. According to *Hung’s* (2021) research findings, AI can help marketers make decisions to identify the appropriate market to target and marketing plan to archive the company mission and vision. AI can also highlight a solution that humans fail to understand. According to *Glikson et al.* (2020), AI trust is connected with algorithm input; people will trust an algorithm if the data-driven choice is transparent. *Davenport* (2020) in his

study highlighted that big data are processed using machine learning or natural language processing algorithms to provide market intelligence.

This draws to the experts' claim that consumer behaviors and patterns may be forecast using AI in human decision-making. The literature review was confirmed with experts' comments and used Carrefour as a case to identify the role AI plays in decision-making. Humans need many data to assess alternatives and possibilities for making strategic decisions. Therefore, AI helps people mine data for more data-driven strategic decisions. Big data are increasingly used to make more accurate predictions. Shrestha et al. (2019) say that combining AI and humans improves corporate decision-making. The research needs to show how to combine advantages properly. Colson's AI framework ends with a possible action option but does not employ AI to forecast future scenarios or developments if a human makes this decision. The Colson framework lacks machine learning and data process. AI's ability to foresee future occurrences suggests a potential application trend. This was a key consideration for decision-makers in expert interviews with Carrefour as a case study.

VI. CONCLUSION

This study presents how AI is used in the strategic marketing decision-making process. The researcher interviewed experts from Carrefour who have experience in AI application and strategic marketing decision-making. The finding indicates AI is used to supporting human decision-making more efficiently by allowing humans to use the available big data to consider their decisions as the system can process a large amount of data. Furthermore, the results also indicate a complex pattern can be fast and accurately dictated using the AI application to increase the quality of human decisions and support in reducing wrong decisions. The study suggests that humans should trust the AI system for implementing technology for decision-making. AI can process large and different data to identify new patterns, which the machine can propose possible actions to humans. Making a potential strategic decision will require a subsequent decision of human experience and subjective opinion. The study further suggests that AI evaluates potential decisions, and the machine generates some possible predictions and future scenarios according to the desired assumption. The study's sampling strategy and size are defined based on the phenomenon. However, the study is limited in generalization due to the lack of a representative sample. To generalize the study's findings, there is a need to conduct the research in a quantitative method to verify the identified themes. There is also a need to prove the development and enhancement of Colson's framework for supporting human decision-making.

A. Limitations and Future Research

This study focuses on ten experts who participated in the interview and may have offered some insight into the circumstance. As a consequence, the findings of this research

could only be relevant to this particular circumstance. The future researcher may need to collect data from a broader range of participants and use a quantitative research method to get a more comprehensive perspective. Another constraint on the study is the time spent by the author. Although respondents were questioned at the appropriate moment, however, it is impossible to say whether their answers would have been different or whether they would have been more accurate under alternative conditions. Third, consider the efforts made to reach the most significant number of experts with experience in AI technology and digital marketing. It required substantial effort to find professionals at ease discussing AI and digital marketing and willing to share their expertise on the subject matter. The author had multiple good leads, and potential participants needed to be more motivated to engage in this research owing to their busy schedules or other restraints. However, the author had only the opportunity to interview ten experts. However, for the researchers to finish ahead of schedule, they were forced to work under pressure. In addition, the authors consented to attend business events that would have resulted in more prospective interviews. Due to the limited time, the authors could only participate in one of these events and were forced to depend on digital techniques and channels to collect interview data. Despite this, the authors gained valuable knowledge about managing their time by conducting and creating this study. If management had not been used, this study would never have been completed in such a short time.

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