

Role of Artificial Intelligence and Business Decision Making

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Abstract—Artificial Intelligence (AI) has emerged as a transformative technology with profound implications for various sectors, including business. In recent years, AI has revolutionized decision-making processes by providing organizations with advanced analytical capabilities, enabling them to extract valuable insights from vast amounts of data. The application of AI in businesses may force the sector to rely on quicker, less expensive, and more accurate marketing techniques. By utilizing the AI in marketing strategies, a business owner may increase audience reaction and build a strong online brand that can compete with others. In addition to marketing, it has the capacity to remodel a business with fresh concepts. Additionally, it provides solutions for challenging problems, aiding in the enormous business growth. The study's primary goal is to investigate how artificial intelligence and decision-making are deployed in business and tried to explore how AI is being used to enhance decision-making processes and how it is changing business models. The study reveals that the role of artificial intelligence in business decision making is transformative, offering significant advantages in terms of efficiency, accuracy, and innovation. AI-powered systems enable businesses to process and analyze vast amounts of data efficiently, leading to quicker and more informed decision making. Overall, the integration of AI in business decision making has the potential to drive organizational success and shape the future of business practices.

Keywords—Artificial intelligence; business decision making; efficiency; accuracy; innovation; marketing strategy; machine learning

I. INTRODUCTION

AI is a disruptive technology advancement that, together with robots, is altering every single fundamental aspect of how businesses operate [1]. Artificial intelligence (AI) is defined as human-produced, machine-assisted, structured, organized information. AIs are created using human insight approaches including learning, reasoning, and self-healing. The future of marketing is artificial intelligence. Artificial intelligence makes it possible to make specific decisions while also saving tons of time and money. Data collection, forecasting, and trend analysis are all capabilities of AI systems. In terms of technology, artificial intelligence is the process of integrating cloud technology, network devices, robots, computers, and the creation of digital content as well as multiple business methods, systems, and day-to-day activities. In the past, present, and future, artificial intelligence computers will flourish. Future marketing initiatives must embrace artificial intelligence's growth and development. Artificial intelligence software is being used by businesses every day to streamline operations, cut costs, speed up turnaround, and increase productivity. Technology is developing at an unheard-of rate,

and businesses who have already switched to advertising AI software will have a unique edge when the next breakthrough rolls along.

Deep learning and machine learning are the two basic categories of AI learning. The learning method used by machines is analogous to human learning. By machine learning, AI-based experience, or gathering empirical data via expertise in existing in the environment, is building knowledge and storing it, and with each new cycle of learning, fixing the problem becomes more efficient and effective. One idea that appears frequently in search engine results is machine learning, which is regarded as a poor kind of artificial intelligence [2]. Hence, machine learning aims to identify the patterns on which algorithms are built. Deep learning is comparable to machine learning, with the exception that AI builds neural networks as it learns. Additionally, human participation is necessary for deep learning since humans provide as examples for AI to learn how to handle problems. This type of learning is employed in multi-layered learning and is frequently utilised in the development of intricate systems intended to address intricate problems [3].

However, as organizations embrace AI in their decision-making processes, it is crucial to address certain challenges. Data privacy and security concerns arise due to the reliance on large amounts of sensitive information. Ethical considerations, such as the responsible and transparent use of AI, must be carefully managed to ensure that decision making aligns with societal values. Additionally, the impact on the workforce needs to be considered, as AI systems automate certain tasks, potentially changing job roles and necessitating reskilling or upskilling initiatives.

The integration of artificial intelligence in business decision making has the potential to revolutionize how organizations operate and strategize. By enhancing efficiency, accuracy, and innovation, AI empowers businesses to harness the power of data and make informed decisions in a dynamic and competitive landscape. However, the responsible and ethical use of AI, along with considerations of data privacy, security, and workforce impact, must be carefully navigated. As businesses continue to embrace AI technologies, the landscape of decision making is set to undergo significant transformations, shaping the future of organizations across various industries.

II. LITERATURE REVIEW

This technology has shown itself to be a strong ally for businesses in terms of supporting operational business

procedures as well as improving the efficiency of their core businesses. To support e-commerce [4], economic activities and information analysis procedures for trading operations [5], informed decision making [6], detecting fraud processes in financial operations [8], or text evaluation of financial information [9], AI is therefore a useful tool. Researchers have highlighted how AI technologies, such as machine learning and natural language processing, enable organizations to automate repetitive tasks and streamline decision-making processes and by leveraging AI algorithms [7], businesses can process vast quantities of data quickly, reducing the time required for analysis and enabling real-time decision making [11]. Organizations to explore new possibilities, identify untapped market opportunities, and develop innovative strategies [12], data privacy and security are critical concerns, as the use of AI involves the processing of sensitive information [13], additionally, ethical considerations arise in the use of AI, such as transparency, fairness, and accountability [14]. In addition, AI is crucial for operations including marketing [10], customer management [15], product launches, after-sales services [16], and stock management [17], as well as for industry 4.0 activities [18]. Due to the speed at which decisions can be made, the ability to analyse complicated circumstances quickly, and the drop in operational costs, the use of specialized algorithms in these jobs produces competitive advantages [19].

The availability of vast volumes of information important to business, or "Big Data," has increased the utility of AI in organisations. This word refers to those vast databases of data that is both structured and unstructured points that exhibit volume, diversity, velocity, as well as other traits including variability, truth, and value [20]. Managerial processes experienced a drastic transformation as a result of business use of big-data as a vital tool [21]. Studies have given conceptual frameworks for the use of big data in business [22], considering the information, technologies, methods, and impacts they have. The phrases "Artificial Intelligence" and its associated terms "Big Data," "Business Intelligence," and "Machine Learning" have shown a rise in queries over the past decade (2010–2019). Business intelligence utilized to be the most prevalent term, but as shown by Fig. 1, its use has steadily declined as analytics and other descriptive analytic solutions have grown more commonplace in businesses.

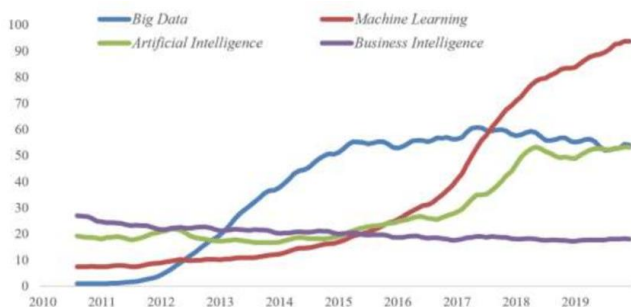


Fig. 1. Popularity of terms among online users between 2010 and 2019: AI, big data, business intelligence, and machine learning.

Business analytics (BA) was described by Davenport and Harris [23] as the "extensive use of data, quantitative and statistical analyses, predictive and explanation models, and

fact-based management" that eventually influences choices and actions. Vidgen, Shaw, and Grant [24] point out how BA may be viewed as a mediator between the data that the organisation has access to and the real economic value that can be obtained by using it to take better actions and make more informed decisions.

To examine the relationship between AI and strategies to create commercial value, Borges et al. [25] conducted a literature study. According to this point of view, this article aimed to close this gap by conducting a thorough literature review focused on the integration of business strategy and AI; incorporating the current approaches and models, featuring the anticipated advantages, difficulties, and opportunities; and starting a dialogue about potential new research directions. In order to present research gaps, they selected papers from conference proceedings and peer-reviewed publications and constructed a framework.

III. ROLE OF ARTIFICIAL INTELLIGENCE IN BUSINESS

The role of AI in modern digital life is quickly expanding, and the advertising and marketing industries are no exception. Artificial intelligence is transforming industries one by one, from the witty and intelligent Siri to Tessa's self-driving car to Google AI that could really learn video games in only a few hours. Artificial intelligence can be used for a variety of purposes, such as identifying data trends to reduce market risks, improving customer service with virtual assistants, or even analyze millions of documents stored on various servers within an organization to identify compliance failures. But businesses have only lately been able to foresee and anticipate the opportunities that robots and artificial intelligence (AI) might offer to the future of business. Businesses can reduce their faults thanks to AI's consistency and rule-based programming. Its endurance, together with ongoing upgrades and the capacity to record procedures, leads to fruitful economic prospects. Artificial intelligence applications make use of robotics, computer vision, voice recognition, machine learning, and natural language processing technology. There are several commercial prospects offered by these technologies.

A. AI in Decision Making

Making decisions is a crucial component of managing a business. Data mining, big data, and enormous files are all significant components of commercial decision-making. Data security is yet another crucial duty. The criteria on which the theory is based are these terms and the replacement of executives. Human and AI are very close to one another. One makes decisions using historical facts, whereas the other utilises experience. Data is a value to AI since without it, AI would not be able to make decisions, Fig. 2.

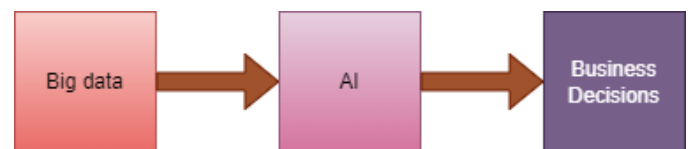


Fig. 2. An AI-based model for decision-making.

Artificial intelligence modeling has the ability to overcome the gap and meet client demands. AI opens the way for specific decision-making and also saves a tonne of time and money. AI systems are capable of data collection, forecasting, and trend analysis. The lifetime value of a customer may also be predicted by AI. Humans can sum it up by stating that AI lowers the system's bounce rate. AI peruses the data in a process known as data mining, also known as opinion mining. Web searches for views and sentiment are made possible through opinion mining. Marketers may learn more about their target markets and particular products in this way. AI makes use of particular websites, online pages, and search engines. AI enables us to make decisions more quickly and simply.

To examine the relationship among AI and decision-making in dynamic corporate situations, Trunk et al. [26] conducted a literature study. In order to provide an overview of the prospects of existing research outlining for linking AI with business decision-making in changing contexts, the authors looked for peer-reviewed publications and did a content analysis. The findings are given in a conceptual framework that first outlines how humans might use AI in decision-making in dynamic situations before outlining the challenges, prerequisites, and implications that should be considered.

The goal of Duan's study [27] was to illustrate how AI may be used to make decisions. According to the study, AI makes broad judgments to support or replace humans on topics like AI's participation and integration. The usage and impact of resurrected AI-based dynamic frameworks are discussed in this research. Also, it offers a number of advices for those that deal with data frameworks. Beginning with publications published in international journals, the research gives a brief overview of AI's historical past (IJIM). The article discusses AI in broad and the primary issues concerning AI. The cooperation and coordination required to supplement or completely replace human representatives were also covered. The study offers research into the usage of AI for dynamics in the age of big data by offering twelve recommendations for were experts and hypothesized turns of occurrences like AI invention and implementation with human association.

IV. METHODOLOGY

With more data, AI gets better. Businesses produce more data every day, so it can learn from it, adapt as it is collected, and use it to get the desired results for the organization or goal. A business may gain a lot from AI data collection that uses previous data to anticipate future results. Real-time processing allows businesses to access data to assist in solving any unresolved problems or making innovations.

In the commercial sector, AI and decision-making are becoming increasingly important. AI solutions may give companies a competitive edge by enhancing customers' perceptions of and interaction with digital strategy-based applications. Innovative aspects geared towards the social cognitive capacities of the AI age will be provided through entrepreneurial intention through the production of new goods. The final result is frequently that fighting and mental training should prioritise safeguarding the advent of AI to create

innovative products and suppliers. Businesses can profit from integrating next-generation AI technology if they have a clear electronic Internet business plan that includes their goals, efficiency, and legal framework. The conceptual framework used in this investigation is shown in Fig. 3.

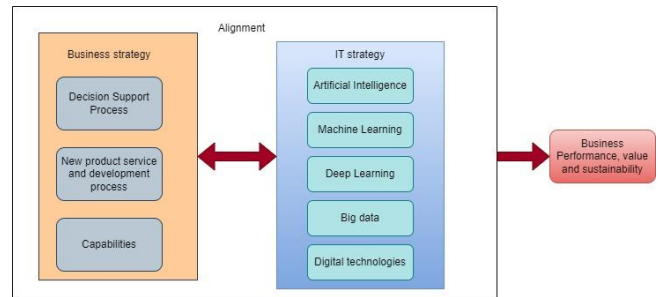


Fig. 3. Conceptual framework.

Our comparison of traditional and AI-based strategic planning suggests a framework that illustrates how the modalities may be used to enhance the value of strategic planning. As depicted in Fig. 4, our strategy's three key organizations are aggregated human AI choice-generating, full human AI delegation, and crossbreed human AI and AI human sequential choice creating.

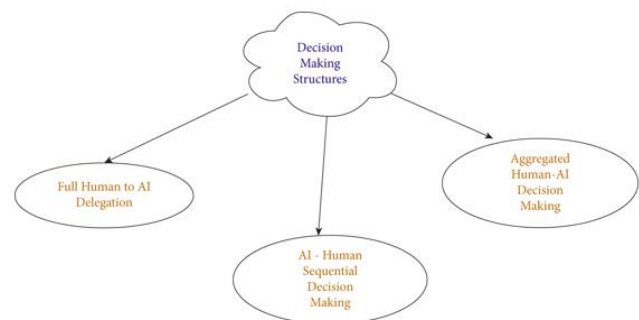


Fig. 4. Building blocks for AI.

Organizational competency and, more importantly, technological and technical competence are used to identify the potential applications of AI. Also, the enterprise using AI must implement business digital transformation. The goal of digital transformation is to alter the business model, or to change the conventional manner of conducting business and move a company online. In addition to altering the business perspective, the organisation greatly improved process efficiency and effectiveness.

V. RESULTS AND DISCUSSIONS

The modern business paradigm is altered by artificial intelligence. Many businesses can improve their efficacy and efficiency by using AI, but doing so comes at a cost of spending a large sum of money to ensure that all of the infrastructure required for such a system to operate normally is in place. Each organisation must also undergo a digital transformation that affects how some organisational departments work in order to use AI. Moreover, digital transformation refers to the conversion of the conventional business model to a virtual system, such as the cloud. Because AI systems may be used for a variety of analyses as well as

decision support, they can have a substantial influence on how well organisations function. The organization's quality management is built on a decision-making process relying on the facts that are documented. The efficiency of AI decision-making tools is shown in Fig. 5, 6, and Table I.

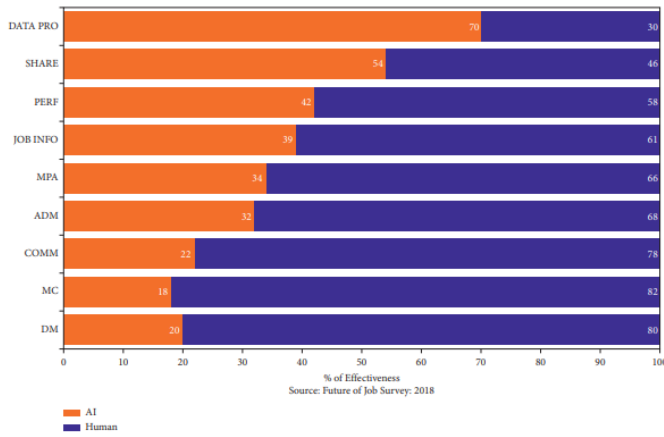


Fig. 5. Using AI technologies effectively in business decision-making (2018).

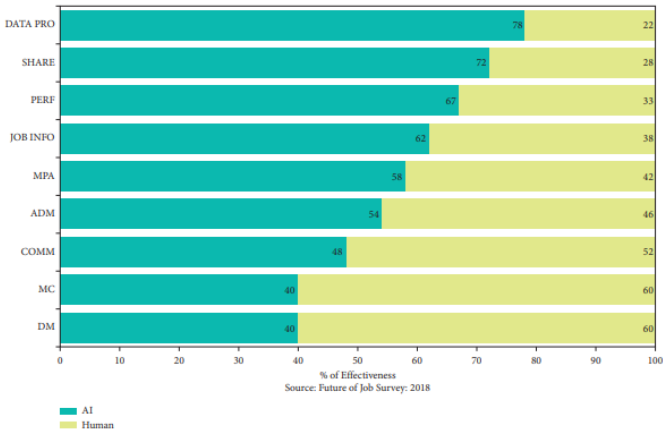


Fig. 6. Using AI Technologies in business decision-making (2022).

TABLE I. USING AI TECHNOLOGIES EFFECTIVELY IN BUSINESS DECISION MAKING

Factors	Human proportionate hours		AI proportionate hours	
	2018	2022	2018	2022
Reasoning and decision-making	80	60	20	40
Managing and coordinating	82	60	18	40
Communication	78	52	22	48
Administration	68	46	32	54
Mental and physical activities	66	42	34	58
Identifying job-related information	61	38	39	62
Complex activities performance	58	33	42	67
Job-related data sharing	46	28	54	72
Data processing	30	22	70	78

The results demonstrate that AI may assist, replace for, or enhance human decision-making when formulating marketing plans. It specifically serves to highlight the prospect of a successful collaboration among management and machines. Moreover, organisational management may model how a potential action would affect various organisational segments due to the predictive modeling that AI is capable of performing. AI can be applied to risk management as well as risk assessment, which also falls under the needs of the system for quality management, when it comes to quality management.

Customer relations are among the most crucial capabilities an AI can have. Customer focus is one of the guiding principles of ISO 9001:2015, therefore AI may be utilised in sales and marketing to gather various types of customer-related data. Such information may be analysed, and the results of that analysis can be applied to better the goods and service that the business provides and in which it participates. As a result of the AI system's ability to respond to nearly all client inquiries soon after they are asked, employing AI in sales and marketing can boost customers' satisfaction. The AI system's most significant capability is its ability to compile all customer inquiries and do analysis, enabling the company to build organisational knowledge that can be used to future problem-solving or product and service enhancement. Apart from that, AI may be applied to nonconformities to solve certain issues based on the information that has been accumulated about how to do so. AI is able to apply several learning methods, like deep learning, machine learning, etc., making this feasible.

The integration of artificial intelligence in business decision making has the potential to revolutionize how organizations operate and strategize. By enhancing efficiency, accuracy, and innovation, AI empowers businesses to harness the power of data and make informed decisions in a dynamic and competitive landscape. However, the responsible and ethical use of AI, along with considerations of data privacy, security, and workforce impact, must be carefully navigated. As businesses continue to embrace AI technologies, the landscape of decision making is set to undergo significant transformations, shaping the future of organizations across various industries.

VI. CONCLUSION

The approach of businesses to make decisions is revolutionised by artificial intelligence. Businesses may make better decisions by utilising AI systems' ability to analyse vast volumes of data and generate predictions and suggestions based on that data. Ultimately, AI has the power to revolutionise corporate decision-making by delivering quicker and more precise insights that can guide both operational and strategic choices. To minimise unforeseen repercussions and preserve consumer confidence, organisations must make sure AI is utilised responsibly and openly. The use of AI in decision-making by organisations and consumers is without a doubt the future. Technology offers many options and a simple means for making business decisions. AI is an extremely clever gadget. Data mining and big data are used to assist it make decisions. The study denies the idea that AI would replace humans and instead says that it is a very dynamic tool that is helpful for making decisions.

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