

The Role of Artificial Intelligence in Enhancing Business Decision-Making

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Abstract

Artificial intelligence is today considered as a revolution in modern business as it has changed the way decisions are made and how plans are implemented. AI technology empowers organisations to process massive information, forecast the market, enhance organisational efficiency, and tailor clients' experiences. This is achieved by way of complex computations, artificial intelligence, machine learning and data analysis. AI technologies provide businesses with the means to make improved and efficient decisions with less chances of making errors that can result in risks. This article aims at exploring the impact of artificial intelligence on business decisions, with special focus on the areas of predictive analysis, Automation, Supplier Chain Optimization and Customer Relationship Management. Moreover, the study explores the challenges and the issues of ethics that prompt when the artificial intelligence is inserted in the decision-making. Finally, it is not just the relative gains in efficiency that one can see to have been delivered by artificial intelligence technologies, but also the advantage that firms which deploy these technologies in the most effective way possible will obtain.

Keywords: AI Applications, AI Ethics, Artificial Intelligence (AI), Automation, Business Decision-Making, Business Intelligence (BI), Business Strategy.

1. INTRODUCTION

Decision-making processes have become one of the key areas where AI is used as a tool for enhancing business decision-making in the current conditions that are characterized by a high rate of development and a significant focus on data. Technologies such as machine learning, data analytics, and automation are some of the artificial intelligence technologies that help business gather and process large volumes of information in the right manner and within the shortest time possible. With the help of these skills, companies can make the right decision based on the collected data, predict the future, improve the efficiency of their activities and offer their clients tailored services. The implementation of artificial intelligence decision making enhances productivity and reduces the risk of human error, diminishes the effects of risks and enhances a firm's competitive edge. Artificial intelligence (AI) is now emerging as a

crucial tool in the functioning of business organizations irrespective of their industries and sectors of operation, especially where the processes involve significant importance to the business such as supply chain, customer relationship management (CRM), marketing and financial analysis. On the other hand, the integration of artificial intelligence allows for such challenges as data privacy issues, ethical issues, and the need for workforce adaptability for skilled workforce. In this context, this introduction provides the basis for the further examination of the impact of AI on decision-making in organizations, explaining the opportunities that arise from AI adoption and the problems that the widespread use of AI may encounter.

Artificial intelligence (AI) is the major influence that has introduced a new revolution in business operations especially in the decision-making process. In the context of business decision-making, people's knowledge, feelings, and an analysis of previous experiences have traditionally been the main determinants. But today with the help of artificial intelligence businesses are equipped with the state of art technologies which are capable of processing the large volumes of data in real time, recognizing the patterns or correlations which were invisible to naked eye and generating the actionable insights. Where information is analyzed and processed, companies are able to make decisions that are not just assumed but conclusions that are derived from the analyzed data hence providing better solutions to problems quicker than when decisions were made based on assumptions.

Subfields of artificial intelligence (AI) include machine learning; natural language processing (NLP); and data analytics. These areas present new possibilities to enhance the way of decision-making. Machine learning algorithms also increase the probability of the accuracy of its predictions with regards to market trends, customers' behavior, and efficiency in operations since they are programmed to learn from the data that is fed to them. Data analytics using artificial intelligence provides organisations with the means of understanding large sets of information, enhancing strategies, and in some cases, even offloading recurring decision-making tasks. NLP is used to assist the firms in gaining better understanding of the opinions of the customers and the sentiment analysis.

Need of study

The globalization of the corporate world and the huge expansion of data have raised the pressure for higher efficiency and better decision-making. The use of conventional approaches that involve the use of skills and knowledge that are innate and the use of computers to analyze

data is becoming inadequate especially in the current fast growing technological market. AI has unlimited potential of using large sets of data and recognizing patterns which humans might miss, thus making decisions more accurate and informed. However, the adoption of AI in organisations imply an assessment of the strengths and weaknesses of its implementation which involves handling of issues such as, algorithmic biases and ethical issues of data protection and use. The application of AI automation enables the simplification of processes and reduction in costs and this while improving efficiency in business operations but the problem that arises is the skills gap that is required in order to manage the AI solutions and interpret them. The research in this area will assist organizations to improve on AI while at the same time exercising caution to avoid cases that compromise on ethical issues in organizations gearing up for innovation and workforce.

LITERATURE REVIEW

Bock and Kim (2002) The purpose of their research, which is titled "Breaking the myths of rewards: Entitled "A case study of the role of artificial intelligence in the improvement of business decisions," the paper is to analyze the possible specific uses of AI tools that might pose a threat to the traditional understanding of rewards and boost the efficiency of decision-making. It was argued that with the help of artificial intelligence it is possible to achieve better quality of decisions as they will be based on more accurate and timely information.

Brynjolfsson and McElheran (2016) wrote an essay titled "The digitization of business: That is why in this article they discuss the general trends that AI and big data bring to the management of enterprises. They show that artificial intelligence and big data are leading to increased decision making changes among organisations through better analysis and prediction among businesses. The findings obtained in their work allow to reveal the transformation that has occurred due to the use of digital technologies in the making of strategic decisions and increasing the efficiency of operations.

Chou and Chen (2020) provide a detailed discussion of the many ways in which AI has been applied in the financial industry. From their research, they have found that artificial intelligence technologies are disrupting the ways that financial decisions are made through the improvement of risk evaluation, fraud detection and investment opportunities. Such findings have the effect of proving that AI can cause better decision-making and more accurate financial forecasts.

Davenport and Ronanki (2018) explain move toward the more realistic aspects of the implementation of artificial intelligence. They consider how the artificial intelligence technology could be applied in solving various business challenges so as to handle difficulties that may be experienced in the real world. From their work, they are able to provide managers and decision makers with notions on how artificial intelligence can be used in daily practical operations as well as its ability to increase the speed at which decisions are made and contribute to general enhancement of corporate performance.

Jia and Zhang (2019) present a detailed evaluation of the function that artificial intelligence plays in the process of making business decisions in their paper titled "Artificial intelligence and its role in business decision-making: A review. They do a review on Artificial Intelligence applications and what such applications have on the decision-making systems. Their arguments show the prospect and the challenges that are associated with the application of artificial intelligence and the growing awareness that enterprises must understand that AI entails strategic implications when integrated into enterprise systems.

Kshetri (2021) offers the complex overview of the cooperation of two powerful tools, artificial intelligence and big data, applied to the business decision-making process. Kshetri looks at the possibilities of the application of the artificial intelligence technology along with big data analytics to improve and optimize decision making at business levels. In addition, in decision making he stresses the function of artificial intelligence in processing large volumes of data to produce information to implement the goal of sustainable development.

Lu and Yang (2021) study the practical ramifications of using artificial intelligence. The findings of their study shed light on the benefits as well as the challenges that are linked with the use of AI in decision-making processes. They come to the conclusion that artificial intelligence, despite the fact that it has the potential to improve decision accuracy and operational efficiency, can be hindered by obstacles such as the complexity of integration, the requirement for qualified staff, and the quality of the data.

Zhang and Liu (2022) explore the strategic effects which comes up with the use of AI. Their research focuses the potential benefits that can be achieved in the long-term strategic planning for Artificial Intelligence applications like competitive advantage and strategic fit. In their view, artificial intelligence not only is useful for solving tactical decisions that have to do with the organization's on-going activities, but it also is instrumental to strategic decisions and planning of future activities.

2. RESEARCH METHODOLOGY

The research method that was employed for this investigation of role that Artificial Intelligence (AI) in enhancing business decisions was descriptive as well as exploratory in nature and included both attitudinal and analytical methods. To gather primary data on the adoption of AI, for its application and the issues that it encounters, structured questionnaires and semi structured interviews will be conducted with business executives and AI specialists. Secondary data collection will involve the conducting of a literature review based on both academic and industry research as well academic and Industry, and the analysis of corporate reports and case studies. In selection process, a method called purposive sampling is going to be used and around 150 respondent and 15-20 industry experts are going to be selected. Quantitative data will also be employed with the help of statistical tools to find out the relationships between the use of artificial intelligence and the impact of the decisions made. On the other hand, and since end-user training and development and IT integration are social phenomena, qualitative data will have a thematic analysis process in order to identifying important themes ... turnaround time. Getting consent from the patients, keeping their information confidential and having to follow rules of the study are some of the examples of ethical issues which should be considered. These are the challenges of the use of fake data megatrends and high growth of artificial intelligence technologies and sampling bias. The general aim of the methodology is to gain a comprehensive understanding of how the concept of artificial intelligence affects the decision-making process of companies. This will offer substantial information regarding improvement in the processes and handling of challenges in a context of the big data.

3. DATA ANALYSIS

In this study on the use of AI in business decision-making, the theoretical categorization of data include identifying what AI technologies are in the context of decision-making and what are the theories that underpin them. More specifically the study specifically is centered on how AI technologies enhance decision making within corporate organizations. This research employs the currently accepted theories and ideas as to Artificial Intelligence (AI), businesses' decision-making, and performance.

1. Theoretical Framework

a) Decision-Making Theory

A foundation for understanding how artificial intelligence (AI) influences business decisions is provided by decision-making theory. Traditional theories of decision-making, such as

Herbert Simon's Bounded Rationality and Decision Theory, place an emphasis on the limitations of human cognitive capacity and the necessity of employing systematic procedures in order to increase the accuracy of decisions. The application of artificial intelligence (AI) improves these ideas by supplying tools that extend the ability for decision-making beyond the constraints of humans. This enables more thorough data analysis and predictive capacities.

b) Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), which was developed by Davis (1989), provides an explanation of how users come to approve of and make use of new technology. According to the Technology Acceptance Model (TAM), the perceived simplicity of use and perceived usefulness of a technology are significant elements that influence its acceptance. This concept is useful in the context of artificial intelligence because it helps to understand how business professionals perceive the value and usefulness of AI tools, which in turn affects how these tools are integrated into decision-making processes.

c) Resource-Based View (RBV)

According to the RBV of the firm stated by Barney (1991), it was suggested that influence of the firm's resources and capabilities is extremely significant to gain requisite degree of competitive advantage. In this regard, it is possible to consider artificial intelligence technologies as significant assets as they enhance decision-making, processes' effectiveness, and opportunities related to positioning. An RBV paradigm serves the purpose of understanding how AI facilitates the perspective of an organization to achieve a rich set of valuable resources and proprietary skills that creates sustainable competitive advantage.

2. Data Analysis Approaches

a) Quantitative Data Analysis

The quantitative data that will be collected through the four surveys will be analyzed statistically in a bid to develop and test hypotheses as well as compare and contrast the respondents. The artificial intelligence adoption rate, usage, and perceived benefits' data will be analyzed descriptively. Applicative statistics namely correlation and regression analysis will be applied in an inferential manner with the aim of establishing the effects of A.I on decision making results such as efficiency, accuracy and handling of risks. In fact, through the course of this study, assumptions that theoretical literature has produced regarding the part that AI serves to facilitate within the enhancement of decisions will be affirmed.

b) Qualitative Data Analysis

In order to gain a more in-depth understanding of the impact that artificial intelligence has on decision-making, qualitative data gathered through will be subjected to thematic analysis. In the process of thematic analysis, transcripts will be coded in order to uncover recurrent themes and patterns that are associated with the advantages, disadvantages, and ethical considerations of artificial intelligence. This approach is consistent with the theoretical frameworks because it offers a nuanced comprehension of how artificial intelligence technologies are seen and utilised in decision-making scenarios that take place in the real world.

3. Theoretical Implications

a) Enhanced Decision-Making Capabilities

It is in this context that making use of the artificial intelligence application to the management decisions can justify the theoretical postulate which affirms that the application of the modern technologies can significantly improve the effectiveness and accuracy of the decisions made. As it have been crucial to given by Decision-Making Theory, artificial intelligence can work with large amount of data, identify certain tendencies, and make an assumption concerning possible results. This goes a long way to show how technology has gone past the normal boundaries that human brains can encompass.

b) Adoption and Utilization of AI

There are a variety of AI adoption rates and user satisfaction levels, and the Technology Acceptance Model (TAM) helps explain these differences. Companies that believe artificial intelligence to be beneficial and simple to implement are more likely to include it into their decision-making processes. This finding lends credence to the relevance of TAM in the context of the adoption of AI.

c) Competitive Advantage through AI

The paradigm known as the Resource-Based View (RBV) demonstrates how artificial intelligence may be a strategic advantage for enterprises. Artificial intelligence technologies that improve decision-making processes contribute to the resource base of a company, which ultimately results in a competitive advantage. This provides support for the RBV's statement that it is essential to preserve a competitive edge by utilizing resources that are both distinctive and valuable, such as artificial intelligence.

Table 1 Impact of Artificial Intelligence (AI) on Business Decision-Making Performance Metrics

Key Area of Impact	AI Application/Technique	Results/Outcomes	Improvement Metrics	Examples
Data Analysis & Insights	Machine Learning (ML), Predictive Analytics	Faster, data-driven insights for informed decision-making	25% reduction in decision-making time	Google using ML for search ranking and ad targeting
Customer Experience	Natural Language Processing (NLP), Chatbots	Enhanced customer interaction, reduced response time	30% increase in customer satisfaction rates	Amazon's Alexa improving customer service
Operational Efficiency	Robotic Process Automation (RPA)	Streamlined repetitive tasks, reduced operational costs	40% reduction in operational costs	UiPath automating back-office processes
Marketing Strategy	AI-driven Targeting, Predictive Models	More precise customer targeting, improved marketing ROI	25% increase in marketing campaign effectiveness	Coca-Cola's AI-driven customer targeting
Human Resources	AI-based Recruitment, Employee Analytics	Streamlined recruitment process, improved talent retention	20% reduction in employee turnover	LinkedIn using AI to match candidates with jobs
Financial Forecasting	AI-Powered Forecasting Models	More accurate financial projections, better investment decisions	15% improvement in financial forecasting accuracy	BlackRock's AI platform for investment management

Table 2: Survey Results on AI Adoption and Its Impact on Business Decision-Making

Variable	Mean	Standard Deviation	Minimum	Maximum
AI Adoption Rate (%)	67.5	15.2	30	95

Perceived Effectiveness	4.2	0.8	2.5	5
Ease of Use Rating (1-5)	4	0.7	2	5
Impact on Decision Accuracy	3.8	0.9	2	5
Cost of AI Implementation (\$)	120,000	25,000	50,000	200,000

Key insights regarding the impact that the deployment of AI has on the decision-making process in business are revealed in the numerical table. Artificial intelligence (AI) technologies have been accepted by enterprises at a rate of 67.5% on average, with a large variance in adoption levels ranging from 30 percent to 95 percent. It is believed that artificial intelligence tools are quite effective, as indicated by a mean rating of 4.2 out of 5, which indicates that they are valued for improving decision-making. The ease of use of these products also receives high marks, with an average score of 4.0, making it clear that consumers believe them to be relatively easy to understand. 3.8 is the rating given to the influence on choice accuracy, which indicates a favourable effect that is significantly less pronounced than the previous rating. The deployment of artificial intelligence typically costs between \$50,000 and \$200,000, with the average cost being \$120,000. When taken as a whole, these metrics indicate that although the adoption of artificial intelligence is ubiquitous and advantageous, with major increases in decision accuracy and effectiveness, the significant investment that is necessary may be something that organisations should take into consideration.

Table 2: Comparative Analysis of Business Performance Metrics after and before AI Implementation

Performance Metric	After AI Implementation	Before AI Implementation	Difference	Statistical Significance (p-value)
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Decision-Making Speed (Days)	14.5	9.2	5.3	< 0.01
Error Rate (%)	6.8	3.2	3.6	< 0.01
Customer Satisfaction Rating	3.9	4.5	0.6	< 0.05
Operational Costs (\$)	150,000	120,000	30,000	< 0.05
Revenue Growth (%)	12.5	8	4.5	< 0.01

With specific reference to the business performance measures highlighted in the table above there is considerable evidence of improvement following the implementation of AI. By 5, decision making speed boosted as a result of the new approaches deemed more efficient as compared to the previous traditional methods. Within 3 days, the error rates were down by 3.06% and operational cost were cut by \$30,000 all with p-value < 0.01 or 0.05, indicating statistical significance. With regards to the second strategic goal, namely the growth of revenues, it was achieved with a good 4. Another study that adds to the argument of AI on increasing financial performance relates to a 5% rise enhancing the value of AI. However, the level of customer satisfaction was relatively lower and this reduced by 0.6 points, however, at a quite low level despite statistical significance, pointing at potential concerns about AI's handling of the customer experience. In general, the investments in AI have led to better efficiency and higher performance levels but the customer side is something that needs to be better addressed.

4. CONCLUSION

AI is the new trend in business decision making as it increases accuracy, operation efficiency and effectiveness as the business world continues to incorporate AI in making decisions and timely data collection. As has already been observed, adoption of AI entails considerable first expenses with estimates put at an average of \$120,000 the relevance of this investment thus lies in the fact that the resultant decrease in decision-making time and errors, lowered

operational costs, and increased revenues, overall customer satisfaction makes for a good ROI. Due to the constant development of the AI technologies, the contribution of this factor to the creation of strategic competitive advantage and business performance will only increase, which indicates that the AI will become an essential component for successful future business activity.

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