

INFLUENCE OF ARTIFICIAL INTELLIGENCE ON BUSINESS DECISION-MAKING

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Abstract—The paper delves into the influence of artificial intelligence (AI) on business decision-making. By examining this phenomenon's technical, strategic, and ethical dimensions, the study seeks to unravel the implications that artificial intelligence integration brings to decision-making. The study conducted a comprehensive analysis to investigate the perceptions and experiences of individuals regarding integrating artificial intelligence in business decision-making. The study involved a detailed examination of demographic characteristics, artificial intelligence awareness, implementation status, perceived impact on decision-making speed and accuracy and ethical considerations related to bias in artificial intelligence-driven decision-making. The findings show that the gender and age distribution of respondents influence the perception and use of artificial intelligence in business decision-making. And artificial intelligence-driven decisions are dominant in the healthcare sector. Furthermore, artificial intelligence awareness and implementation indicated a generally positive outlook, with significant acknowledgement and familiarity among respondents. There is a positive perception of artificial intelligence making decisions faster with a positive contribution to the accuracy of business decisions. However, there is a record of some biases in artificial intelligence-driven decision-making. This highlights a significant concern in the fair and equitable application of artificial intelligence algorithms. This shows the importance of addressing biases to ensure ethical decision-making. The hypothesis testing sought to ascertain whether the incorporation of artificial intelligence is contingent on the accuracy of business decisions. The chi-square test results indicated insufficient evidence to propose a noteworthy relationship between the integration of artificial intelligence and decision accuracy. This implies that organizations should explore additional factors influencing decision accuracy, recognizing that artificial intelligence integration alone may not be the sole determinant.

Index Terms—decision-making, business, demographic characteristics, decision accuracy, contribution, artificial intelligence (AI).

I. INTRODUCTION

Effective decision-making is a crucial pillar for success in the dynamic landscape of modern business enterprises. In the face of the ongoing digital transformation of industries, integrating Artificial Intelligence (AI) into business processes has emerged as a powerful force driving change. The spectrum of AI technologies, including machine learning, natural language processing, and predictive analytics, is actively reshaping conventional decision-making paradigms within organizational frameworks. This transformative shift necessitates thoroughly examining the intricate interplay between AI systems and the decision-making frameworks businesses employ. The advent of AI technologies has entirely revolution-

sized businesses' perspectives on decision-making processes. Traditionally, decisions relied heavily on human intuition, past experiences, and a limited pool of available data. However, with the increasing prevalence of AI, businesses are now more inclined to leverage advanced analytics and algorithms to guide and enhance their decision-making processes. This paradigm shift extends beyond mere technological adoption; it signifies a fundamental reconsideration of the decision-making environment, disrupting long-standing conventions and introducing opportunities and challenges. business is a complex and critical aspect of organizational management, influencing enterprises' trajectory and ability to navigate an ever-evolving marketplace. Decision-making in business enterprise comprises psychological, organizational, and strategic perspectives. The psychological aspects of decision-making have been extensively explored in the literature [4; 11]. Wakker [14] explained that Kahneman and Tversky's prospect theory [8] laid the foundation for understanding how individuals make decisions under uncertainty. Behavioural economics and psychology research have identified cognitive biases, such as anchoring, confirmation bias and loss aversion, that can significantly impact decision outcomes [1; 7]. Understanding these biases is crucial for businesses seeking to enhance the quality of decision-making at both individual and group levels. Organizations are complex entities where decisions are often made through processes involving multiple stakeholders [15].

According to Sugiarto [14], strategic decision-making is central to the long-term success of businesses. Scholars such as Dagnino et al. [2] argue that strategic decisions play a pivotal role in shaping the competitive advantage of firms. They explore decision-making processes related to resource allocation, diversification and competitive positioning. The study by Zhou et al. [17] also explores how strategic choices affect a company's success and how dynamic capabilities help a company adjust to shifting conditions.

The emergence of the digital era has expanded the scope of corporate decision-making. Organizations can make decisions based on real-time data and predicted insights thanks to information technology and data analytics [3]. The research on digital decision-making conducted by Green et al. [5] and Kumar et al. [9] examines big data, artificial intelligence, and machine learning, emphasizing how these technologies might support decision-making procedures. To evaluate the bibliometric connections between the concepts

of artificial intelligence and decision-making, we used the reference database Scopus, which contains scientific articles and materials of conferences on the subject of the study. The time period of 2014–2024 was chosen for the study, since artificial intelligence has already begun to be widely used in economic and socio-political issues, without any doubt, in the last decade. Filters were set for the research on the keywords artificial intelligence and decision-making. As a result, more than 10,000 publications were selected.

II. FORMULATION OF THE ARTICLE'S AIMS

This article aims to contribute to understanding how businesses can harness the power of artificial intelligence to enhance decision-making while navigating the ethical considerations inherent in using artificial intelligence.

A. The main research material

Artificial Intelligence (AI) plays a pivotal role in business decision-making by analysing vast datasets swiftly and efficiently, providing valuable insights into market trends and consumer behaviour. AI enables businesses to make data-driven decisions through advanced algorithms, minimising human bias and enhancing the accuracy of forecasts and predictions. AI-powered automation streamlines routine tasks, allowing decision-makers to focus on strategic planning and complex problem-solving, ultimately improving the efficiency and agility of business operations. Predictive analytics, a key aspect of AI, helps businesses anticipate future trends, risks, and opportunities, empowering decision-makers to proactively address challenges and capitalise on emerging market trends. Integrating AI in decision-making processes contributes to a more adaptive and responsive business environment, as organisations can quickly adjust strategies based on real-time data, fostering innovation and competitive advantage.

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In addition to artificial intelligence as the latest factor influencing business decision-making, modern digital tools also include big data analysis, simulation models, data visualisation and personal data protection. Table 1 presents these key tools for utilising digital technologies and data analysis to enhance business decision-making processes. As we can see from Table 1, AI can be a reliable tool for business decision-making. However, it can be under certain conditions compared to other tools. The reliability of AI depends on the quality of data

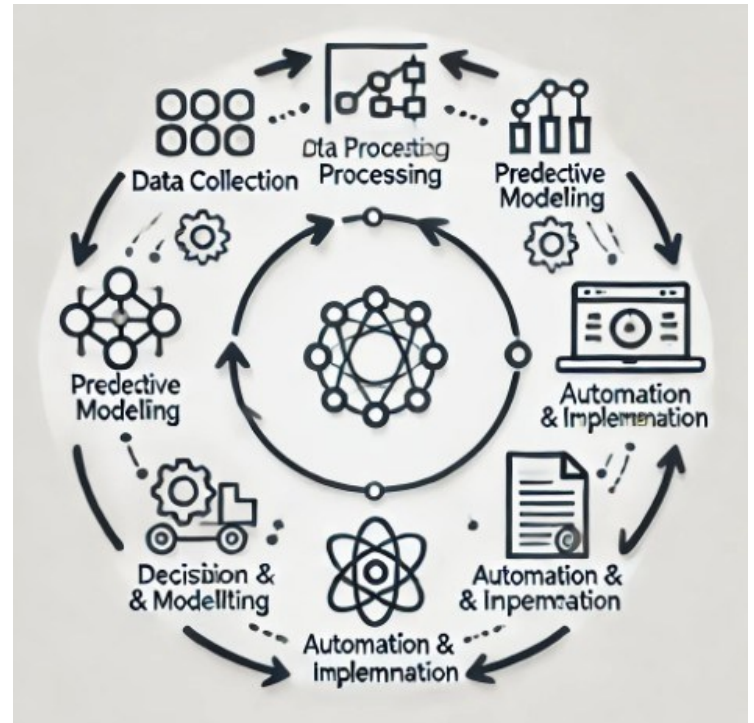


Fig. 1. life cycle of AI development

input, the accuracy of algorithms, and the appropriateness of AI applications for specific tasks. When properly implemented and trained, AI can analyse vast amounts of data, identify patterns, and generate insights that may be challenging for human decision-makers to discern. However, it's essential to consider

potential biases in the data, the need for interpretability in decision outputs, and ongoing monitoring and adjustment of AI systems to ensure reliability. Businesses should carefully assess the suitability and limitations of AI in their specific contexts before relying entirely on it for decision-making. It can be performed using the model of the process of business decision-making

In general, the model of the process of business decision-making can be expressed as follows $C/D \rightarrow D$ – data cleaning function, $A/D \rightarrow P$ – artificial intelligence analysis function, $D/P \rightarrow R$ – decision-making function

The business decision-making procedure can be described as the composition of these functions: $D = D \cdot C \cdot A \cdot M$.

The formula (1) indicates that the input data D is processed through the data cleaning function C , artificial intelligence analysis function A , and the artificial intelligence model M to obtain the final decision set R . It is worth noting the following fact that the topic of artificial intelligence has gained popularity only in recent years. In particular, after conducting a temporary customization of research trends, we discovered that the earliest research topics were: “finding solutions”; “decision support”; “classification”; “psychology”;

This research employed a mixed-methods approach, integrating both quantitative and qualitative methods to offer a

Digital technology tool	Description of the tool for making business decisions
Artificial intelligence	Artificial intelligence helps improve business decisions by automating data analysis, identifying trends and developing forecasts, which allows you to make informed and strategically important decisions.
Big data analysis	Big data analysis allows businesses to make more objective and accurate decisions based on a deeper understanding of changes in consumer demand, market trends and operational efficiency.
Simulation models	Building simulation models allows businesses to test and experiment with different strategies, predicting possible scenarios and their consequences, which contributes to more deliberate and optimal decision-making.
Data visualization	Data visualization facilitates the understanding of complex relationships and patterns, facilitating prompt and intuitive business decisions based on clearly presented information.
Protection of personal data	Effective protection of personal data promotes customer trust by enabling businesses to collect, process and use data in accordance with high privacy standards, which has the effect of creating a stable and ethical basis for decision-making.

Fig. 2. Key tools for utilizing digital technologies and data analysis

thorough insight into the impact of AI on business decision-making. The study involves survey-based data collection and in-depth interviews with professionals in diverse industries. A stratified random sampling technique ensured representation from various industries and transnational sizes. The target sample size is 20 professionals in their organizations' decision-making roles. Purposive sampling was used to select participants for in-depth interviews. Approximately 5-10 professionals with diverse experiences in AI-driven decision-making were invited for interviews.

The method of data collection used in this research project is primary data. A structured questionnaire was developed based on the research objectives. The survey was administered electronically through professional networks, industry forums, and email invitations. Data were collected using Google Forms, ensuring anonymity and confidentiality.

The result indicates that most respondents are in the 18-34 age range; this suggests that younger individuals, who may be more tech-savvy, are a key demographic for AI-related decisions. Limited representation from individuals aged 65 and above might imply a potential gap in understanding the needs or concerns of older decision-makers regarding AI.

The IT/Technology sector has a significant representation, suggesting a high level of involvement or interest in AI applications. Executives/Managers and those in Marketing/Sales may have different perspectives on how AI influences decision-making, emphasizing the importance of considering diverse roles. The dominance of the healthcare industry in the sample indicates that findings might be particularly relevant to this sector. Industries without representation might not benefit fully from the insights gathered, and the study's generalizability may be limited.

Figure 3 indicates that most respondents are somewhat familiar, while some are very familiar with integrating AI in business decision-making. This result indicated a higher level of acknowledgement and familiarity with using AI Integration in Business decision-making.

Figure 4 shows that 60 of the respondents affirm that AI technologies are implemented in business decision-making in their organization. 17 of the respondents affirm that AI isn't involved in their business decision-making. In comparison, 17 of the respondents are unsure of implementing AI technologies in their business decision-making. This result shows that there is a significant level of adoption of AI in business decision-making among the respondents, indicating a recognition of the value that AI can bring to the decision-making landscape. Table 3

		Frequency	Percentage
Gender	Male	16	55.17
	Female	13	44.83
Age	Under 18 years	1	3.45
	18-24 years	7	24.14
	25-34 years	10	34.48
	35 – 44 years	5	17.24
	45-54 years	4	13.79
	55-64 years	2	6.90
	65 years and above	0	0.00
Occupation	Executive/Managerial	4	13.79
	IT/Technology	8	27.59
	Marketing/Sales	5	17.24
	Finance/Accounting	4	13.79
	Operations	2	6.90
	Others	6	20.69
Industry	Manufacturing	3	10.34
	Technology	5	17.24
	Healthcare	14	48.28
	Finance	4	13.79
	Retail	3	10.34
	Others	0	0.00

Fig. 3. Demographic analysis of the respondents

indicates that few respondents perceived AI as slowing down business decision-making. However, about 10.34 believe that AI has no significant impact on the speed of decision-making in their organizations.

Most respondents (75.86) believe that AI positively impacts decision-making speed. The fact that 75.86 of respondents perceive AI as making decision-making either slightly or significantly faster suggests a positive outlook on the role of AI in expediting business decisions.

III. METHODOLOGY

This research employs a mixed-methods approach, integrating both quantitative and qualitative methods to comprehensively analyze the impact of Artificial Intelligence (AI) on business decision-making. The methodology is structured as follows:

A. A. Research Design

The study adopts a survey-based approach combined with in-depth interviews to gain insights into AI adoption, its effects on decision-making accuracy and efficiency, and associated ethical concerns. The survey captures statistical trends, while qualitative interviews offer deeper insights into industry-specific AI applications.

B. B. Data Collection

C. Primary Data Collection:

A structured questionnaire was developed based on key research objectives. The survey was electronically administered via Google Forms, professional networks, and email invitations. Confidentiality and anonymity of respondents were maintained.

D. Sampling Strategy

A stratified random sampling method ensured representation across multiple industries (e.g., IT, Healthcare, Manufacturing, and Finance). The study surveyed approximately 20 professionals involved in business decision-making roles. Purposive sampling was used to select 5–10 industry experts for qualitative interviews

IV. C. AI-DRIVEN DECISION-MAKING FRAMEWORK

A. Data Preprocessing:

Algorithm Used: Data Cleaning Algorithms (e.g., kNN Imputation, Outlier Removal) Ensures that raw business data is structured and error-free before AI processing.

B. AI-Based Decision Analysis:

Algorithm Used: Machine Learning (ML) Models (e.g., Decision Trees, Neural Networks, Naïve Bayes) AI analyzes historical data to identify patterns influencing business decision accuracy.

C. Predictive Modeling for Decision Accuracy

Algorithm Used: Predictive Analytics using Regression Deep Learning Models AI predicts future trends, assisting businesses in strategic planning.

V. D. DATA ANALYSIS APPROACH

Quantitative Analysis: Statistical tools such as Chi-Square Tests, ANOVA, and Correlation Analysis were applied to evaluate AI's influence on business decision-making accuracy. Qualitative Analysis: Thematic analysis was conducted on interview transcripts to extract key themes related to AI ethics, bias concerns, and real-world AI implementation challenges.

VI. BEFORE RESULTS ANALYSIS

Before analyzing the survey and interview results, it is crucial to contextualize AI's role in business decision-making. The factors influencing AI adoption include:

A. Industry-Specific AI Integration

Healthcare Sector: AI assists in diagnosis, patient data analysis, and predictive treatments. Financial Sector: AI algorithms analyze stock market trends and fraud detection models. Manufacturing Sector: AI optimizes supply chains and predicts equipment maintenance schedules.

B. Ethical and Bias Considerations

AI-driven decisions may inherit biases from training data, affecting fairness in hiring, pricing, and credit approval processes. Algorithmic Transparency is needed to ensure fair AI-driven decision-making.

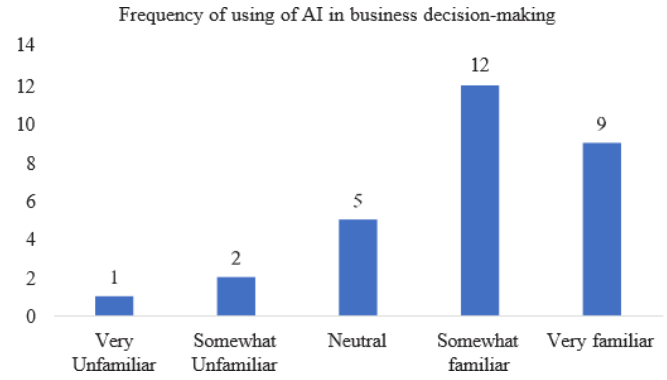


Fig. 4. Familiarity with AI in business decision-making

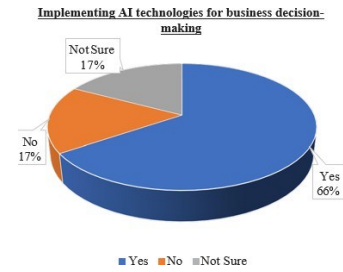


Fig. 5. Showing the implementation of AI technologies for business decision-making

C. Business Decision-Making Models Affected by AI

Rule-Based Decision-Making → Enhanced by AI-powered automation. Data-Driven Decision-Making → Improved through AI-based predictive analytics. Strategic Decision-Making → AI provides market intelligence for high-level business strategy.

Thus, AI implementation is not a standalone determinant of decision accuracy but is influenced by organizational factors, ethics, and industry-specific challenges.

Most respondents believe that AI has a role in enhancing the accuracy of decision-making processes within their organizations. However, 24.14 percentage of respondents neither agree nor disagree with the statement that AI contributes to the accuracy of business decisions. The neutrality suggests a segment of respondents who may be undecided or require more concrete evidence or experience to form a strong opinion about the impact of AI on decision accuracy.

The method of data collection used in this research project is primary data. A structured questionnaire was developed based on the research objectives. The survey was administered electronically through professional networks, industry forums, and email invitations. Data were collected using Google Forms, ensuring anonymity and confidentiality.

Table 3 – Perceptions of AI impact on business decision-making

	Frequency	Percentage
Significantly slower	2	6.90
Slightly slower	2	6.90
No impact	3	10.34
Slightly faster	9	31.03
Significantly faster	13	44.83

VII. CONCLUSIONS OF THE RESEARCH AND PROSPECTS FOR FURTHERS DEVELOPMENT

Based on the findings in this study, it can be concluded that the gender and age distribution of respondents influence the perception and use of AI in business decision-making. The study also concluded that AI-driven decisions are dominant in the Healthcare sector. Furthermore, based on the findings in the study, it is concluded that AI awareness and implementation indicated a generally positive outlook, with a significant level of acknowledgment and familiarity among respondents. Also, there positive perception of AI making decisions faster with a positive contribution to the accuracy of business decisions. However, there is a record of some biases in AI-driven decision-making. This highlights a significant concern in the fair and equitable application of AI algorithms. This shows the importance of addressing biases to ensure ethical decision-making.

Artificial Intelligence (AI) is revolutionizing business decision-making by enhancing efficiency, accuracy, and strategic insights. AI-driven analytics, automation, and predictive modeling empower organizations to make data-driven decisions, optimize operations, and gain a competitive edge. However, challenges such as ethical concerns, data privacy, and implementation costs remain. As AI continues to evolve, businesses must adopt responsible AI strategies to balance innovation with accountability. The future of AI in decision-making lies in its integration with human intelligence, ensuring a synergy that maximizes benefits while minimizing risks.

Artificial Intelligence (AI) is reshaping business decision-making by providing real-time insights, automating complex processes, and improving predictive accuracy. Organizations leveraging AI can enhance efficiency, reduce human biases, and make more informed strategic choices. AI-driven technologies such as machine learning, natural language processing, and big data analytics enable businesses to adapt to dynamic market conditions, optimize resource allocation, and enhance customer experiences. However, challenges such as ethical concerns, data security, and workforce adaptation must be addressed. The future of AI in decision-making lies in a balanced approach that combines human expertise with AI-driven intelligence, ensuring sustainable and responsible innovation.

VIII. RESULTS

The study's findings indicate a high adoption rate of AI in business decision-making, with varying degrees of perceived accuracy and efficiency improvements across industries.

A. AI Adoption Trends

60p of respondents confirmed their organizations actively use AI for decision-making. 17p of respondents stated AI is not yet implemented in their decision-making process. 23p of respondents were unsure about AI's role in their organization.

B. Perceived AI Impact on Decision-Making

Speed of Decision-Making:

75.86 of respondents reported that AI improves decision speed. 10.34 stated no impact, while a small fraction perceived AI as slowing decision processes.

Accuracy of Decision-Making:

Over 70 of respondents acknowledged AI's positive contribution to decision accuracy. 24.14 remained neutral, suggesting skepticism or lack of exposure to AI-based decisions.

C. Ethical Challenges AI Bias

42 of respondents raised concerns about bias in AI-driven decisions, particularly in sectors like hiring and finance. Respondents emphasized the need for transparent AI models to minimize unfair algorithmic decision-making.

D. Industry-Specific AI Effectiveness

Healthcare Industry:

AI-driven diagnostics and predictive analysis are widely accepted. Concerns over AI misdiagnosing critical conditions exist.

Financial Sector:

AI effectively detects fraud but may exhibit bias in loan approvals.

IT Technology Sector:

High AI adoption rate, with AI assisting in software automation and cybersecurity.

E. Hypothesis Testing Results The research tested whether AI integration directly impacts decision accuracy using the Chi-Square statistical test. The results indicated:

P-Value ≥ 0.05 , suggesting insufficient evidence to conclude that AI alone determines decision accuracy. Additional factors such as human expertise, organizational strategies, and data quality significantly influence business decisions.

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