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AI-DRIVEN BUSINESS ANALYTICS FOR IMPROVING MANAGERIAL DECISION-MAKING AND ORGANIZATIONAL PERFORMANCE

Lakshmi Vasanthi Jampani *

MBA Faculty
Wrexham Glyndwr University. UK.
* Corresponding Author

ORCID iD: 0009-0008-3741-6460

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ABSTRACT

The rapid adoption of Artificial Intelligence (AI) and business analytics is transforming organizational decision-making by enabling managers to utilize large volumes of data for timely and informed business decisions. This study examines the role of AI-driven business analytics in improving managerial decision-making and organizational performance. The study proposes an integrated framework in which AI-driven business analytics capability influences organizational performance through enhanced managerial decision-making effectiveness. The framework considers the ability of AI-enabled analytics to provide predictive insights, identify business patterns, support risk assessment, and improve the quality and speed of managerial decisions. A quantitative research approach is proposed, using a structured questionnaire to collect data from managers and executives working in organizations that utilize AI and business analytics. The collected data will be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the proposed relationships and mediation effects. The study is expected to demonstrate that effective utilization of AI-driven analytics can strengthen managerial decision-making and contribute to improved organizational outcomes. The study contributes to the emerging literature on AI-enabled management by linking analytical capabilities, managerial decision-making, and organizational performance within a unified framework. The findings are expected to provide practical guidance for organizations seeking to develop data-driven and AI-enabled decision-making capabilities.

Keywords: Artificial Intelligence; Business Analytics; Managerial Decision-Making; Organizational Performance; Predictive Analytics; Data-Driven Decision-Making; AI Capability

1 INTRODUCTION

The rapid advancement of Artificial Intelligence (AI), big data, and business analytics has significantly transformed the way organizations generate information and make managerial decisions. Organizations increasingly rely on data-driven technologies to understand market trends, predict customer behavior, optimize resources, identify risks, and improve operational efficiency. Unlike traditional business intelligence systems that primarily provide descriptive information about past events, AI-driven business analytics integrates advanced analytical techniques such as machine learning, predictive analytics, and intelligent decision-support mechanisms to generate forward-looking and actionable insights.

Managerial decision-making is one of the most important areas in which AI-driven business analytics can create organizational value. Managers are required to make timely and accurate decisions in environments characterized by uncertainty, competition, technological change, and rapidly changing customer expectations. AI-enabled analytics can support managers by processing large volumes of data, identifying patterns that may not be easily recognized through conventional analysis, forecasting future outcomes, and evaluating alternative courses of action. Recent empirical research indicates that AI-driven decision-making is positively associated with firm performance, while AI capabilities can particularly improve the speed and effectiveness of managerial decisions.

However, the adoption of AI and analytics technologies does not automatically result in improved organizational performance. The value generated from analytics depends on the organization's ability to transform data and analytical outputs into effective managerial decisions. Recent research demonstrates that decision quality can act as a central mechanism through which business analytics capabilities contribute to firm performance. It also suggests that analytics value depends on complementary technical, human, and organizational capabilities rather than isolated investments in analytical technologies.

Although previous studies have examined business analytics, AI capabilities, decision-making, and organizational performance, there remains a need for a more integrated understanding of how AI-driven business analytics contributes to organizational outcomes. In particular, the role of managerial decision-making as a mechanism linking AI-driven analytics with organizational performance requires further investigation. Recent research has also emphasized that organizational context and managerial capabilities influence the extent to which analytics investments generate business value.

Therefore, this study investigates the relationship between AI-driven business analytics, managerial decision-making effectiveness, and organizational performance. The study proposes that AI-driven business analytics improves the availability, quality, and timeliness of information available to managers, which subsequently enhances decision quality and contributes to improved organizational performance.

The study addresses the following research objectives:

- To examine the influence of AI-driven business analytics on managerial decision-making effectiveness.
- To investigate the relationship between managerial decision-making effectiveness and organizational performance.
- To examine the mediating role of managerial decision-making effectiveness in the relationship between AI-driven business analytics and organizational performance.
- To provide practical insights for organizations seeking to use AI-driven analytics for improved managerial and organizational outcomes.

The study contributes to the growing literature on AI and business analytics by connecting technological capability with managerial decision-making and organizational performance within an integrated framework. From a managerial perspective, the study can help organizations understand that successful AI adoption requires not only technological investment but also the ability to convert analytical insights into timely, accurate, and effective managerial decisions.

2 LITERATURE REVIEW

Artificial Intelligence (AI) and business analytics have become important tools for organizations seeking to improve data-driven decision-making. Business analytics enables organizations to transform large volumes of data into meaningful insights for business planning and management [1]. The integration of AI and machine learning further strengthens analytics by supporting prediction, pattern recognition, and intelligent recommendations [2]. However, the value generated from analytics depends on organizational capabilities, data resources, and analytical expertise [3], while effective alignment between analytics capability and business strategy can further improve firm performance [4].

AI-driven analytics also has a significant role in managerial decision-making. AI can support managers by providing faster access to information, forecasting outcomes, identifying patterns, and evaluating alternatives [5]. Empirical studies indicate that AI-driven decision-making can positively influence organizational performance [6]. AI capabilities have also been found to improve decision speed and decision quality, demonstrating the importance of AI in managerial processes [7].

Business analytics is similarly associated with improved organizational performance. Analytics capabilities can enhance organizational agility and operational effectiveness by enabling organizations to respond more effectively to changing business conditions [8]. Research has also reported positive relationships between big data analytics capabilities and

firm performance [9]. Recent evidence suggests that decision quality is an important mechanism through which analytics capabilities contribute to improved firm performance [10].

Managerial decision-making therefore represents a potential link between AI-driven analytics and organizational performance. Business analytics can improve business processes, which subsequently contributes to better organizational outcomes [11]. Data-driven decision-making has also been identified as an important pathway through which organizational capabilities influence performance [12]. However, the effectiveness of AI analytics can depend on organizational factors such as data governance, managerial skills, and organizational readiness [13].

Although previous studies have examined AI capability, business analytics, decision-making, and organizational performance separately, limited research has integrated these constructs into a single framework. Recent literature emphasizes the need to examine how AI capabilities are translated into organizational value through managerial processes [14]. Similarly, the conversion of analytics capabilities into competitive performance depends on effective organizational and knowledge capabilities [15]. Therefore, this study proposes that AI-driven business analytics improves organizational performance through enhanced managerial decision-making, providing an integrated perspective on AI-enabled organizational performance.

3 THEORETICAL FOUNDATION AND HYPOTHESIS DEVELOPMENT

3.1 Theoretical Foundation

This study is grounded in the Resource-Based View (RBV), which considers organizational resources and capabilities as sources of competitive advantage. AI technologies, analytical capabilities, quality data, and managerial expertise can therefore be considered strategic resources that support organizational performance.

The study proposes that AI-driven business analytics improves organizational performance not only directly but also by enhancing the quality and effectiveness of managerial decision-making. Thus, managerial decision-making is positioned as a mediating mechanism between AI-driven business analytics and organizational performance.

3.2 Hypothesis Development

AI-Driven Business Analytics and Managerial Decision-Making

AI-driven analytics provides managers with predictive insights, real-time information, and analytical recommendations that can improve the speed and quality of managerial decisions. Therefore:

- H1: AI-driven business analytics has a positive and significant effect on managerial decision-making.

3.2.1 Managerial Decision-Making and Organizational Performance

Effective managerial decisions can improve resource allocation, operational efficiency, responsiveness, and strategic outcomes. Hence:

- H2: Managerial decision-making has a positive and significant effect on organizational performance.

3.2.2 AI-Driven Business Analytics and Organizational Performance

Organizations using AI-enabled analytics can identify business opportunities, predict market trends, reduce risks, and improve operational processes. Therefore:

- H3: AI-driven business analytics has a positive and significant effect on organizational performance.

3.2.3 Mediating Role of Managerial Decision-Making

AI-driven analytics can generate value when managers effectively interpret and apply analytical insights to organizational decisions. Recent research similarly identifies decision-making processes as an important mechanism linking AI capabilities with organizational performance.

- H4: Managerial decision-making mediates the relationship between AI-driven business analytics and organizational performance.

4 METHODOLOGY

4.1 Research Design

This study adopts a quantitative and cross-sectional research design to examine the relationship between AI-driven business analytics, managerial decision-making, and organizational performance. Primary data will be collected through a structured questionnaire from professionals who have experience with AI, business analytics, or data-driven decision-making. The research methodology followed in this study is presented in Figure 1

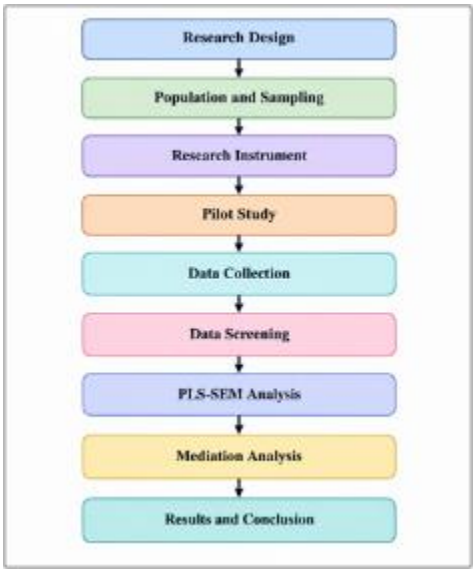

Figure 1: Research Methodology Framework

4.2 Population and Sampling

The target population consists of managers, executives, business analysts, IT professionals, and other employees involved in organizational decision-making. A purposive sampling technique will be used to ensure that respondents have adequate exposure to AI-enabled analytics and technology-supported decision-making. The questionnaire will be distributed electronically through professional networks and organizational contacts. The required sample size will be determined using an appropriate statistical power analysis.

4.3 Research Instrument

A structured questionnaire will be developed based on the constructs identified in the literature. AI-driven business analytics will be measured through items related to predictive analytics, data processing, analytical insights, and AI-enabled information support. Managerial decision-making will be measured through decision quality, decision speed, analytical information use, and decision confidence. Organizational performance will be assessed through operational efficiency, productivity, innovation, and overall business performance. All items will be measured using a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

4.4 Data Collection

Before the main survey, a pilot test will be conducted to assess the clarity and consistency of the questionnaire. Based on the feedback, necessary modifications will be made. The final questionnaire will then be administered online. Participation will be voluntary, and respondents will be informed about the academic purpose of the study and the confidentiality of their responses. Incomplete and duplicate responses will be removed before analysis.

4.5 Data Analysis

The collected data will be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS. PLS-SEM is appropriate because the study focuses on explaining and predicting relationships among multiple constructs and specifically examines a mediation relationship.

The analysis will first assess the measurement model using indicator loadings, Cronbach's alpha, composite reliability, Average Variance Extracted (AVE), and the Heterotrait-Monotrait (HTMT) ratio to establish reliability, convergent

validity, and discriminant validity. The structural model will then be evaluated using path coefficients, significance levels, R^2, effect sizes, and bootstrapping.

4.6 Mediation Analysis

The main purpose of the study is to examine whether managerial decision-making mediates the relationship between AI-driven business analytics and organizational performance. The proposed relationship is represented as AI-Driven Business Analytics, Managerial Decision-Making, Organizational Performance. The direct, indirect, and total effects will be assessed using bootstrapping. A significant indirect effect will provide evidence that managerial decision-making functions as a mediator between AI-driven business analytics and organizational performance.

4.7 Ethical Considerations

Participation will be voluntary, and respondents will be informed about the purpose of the research. Confidentiality and anonymity will be maintained, and the collected information will be used only for academic purposes.

5 RESULTS

5.1 Respondent Profile

For the purpose of demonstrating the proposed analytical framework, an illustrative dataset of 250 valid responses was considered. The respondents represented professionals, managers, executives, business analysts, and IT-related employees with experience in AI-enabled analytics and data-driven decision-making. The demographic distribution indicates adequate representation across age groups, professional experience, organizational roles, and industry sectors.

Table 1: Respondent Profile

Variable	Category	Frequency	Percentage
Age	18–30 years	61	24.4%
	31–40 years	91	36.4%
	41–50 years	63	25.2%
	Above 50 years	35	14.0%
Gender	Male	151	60.4%
	Female	99	39.6%
Experience	Less than 5 years	54	21.6%
	5–10 years	83	33.2%
	11–15 years	67	26.8%
	More than 15 years	46	18.4%
Position	Manager/Executive	96	38.4%
	Business Analyst	51	20.4%
	IT Professional	62	24.8%
	Other Professional	41	16.4%
AI/Analytics Experience	Less than 2 years	48	19.2%
	2–5 years	94	37.6%
	More than 5 years	108	43.2%

The respondent profile indicates that a substantial proportion of participants had experience with AI and business analytics. In particular, 43.2% reported more than five years of experience with AI or analytics-related activities, suggesting that the sample provides a suitable basis for examining AI-driven managerial decision-making.

5.2 Measurement Model Assessment

The measurement model was evaluated using indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Cronbach's alpha, rho_A, and composite reliability were used to assess internal consistency, while average variance extracted (AVE) was used to evaluate convergent validity. Current PLS-SEM guidance recommends reporting these measures together with indicator loadings and HTMT for reflective constructs.

Table 2: Measurement Model Results

Construct	Indicator	Loading	Cronbach's α	rho_A	CR	AVE
AI-Driven Business Analytics	AIBA1	0.812	0.912	0.915	0.935	0.741
	AIBA2	0.851				
	AIBA3	0.884				
	AIBA4	0.873				
	AIBA5	0.869				
Managerial Decision-Making	MDM1	0.821	0.903	0.907	0.928	0.721
	MDM2	0.856				
	MDM3	0.879				
	MDM4	0.861				
	MDM5	0.832				
Organizational Performance	OP1	0.817	0.921	0.924	0.941	0.763
	OP2	0.884				
	OP3	0.902				
	OP4	0.871				
	OP5	0.889				

All indicator loadings exceed 0.80, demonstrating strong indicator reliability. Cronbach's alpha values range from 0.903 to 0.921, while composite reliability ranges from 0.928 to 0.941. The AVE values range from 0.721 to 0.763 and therefore indicate satisfactory convergent validity. These results suggest that the indicators consistently represent their respective constructs.

5.3 Discriminant Validity

Discriminant validity was examined using the heterotrait-monotrait ratio (HTMT). HTMT is recommended as a preferred assessment of discriminant validity in PLS-SEM.

Table 3: HTMT Discriminant Validity

Constructs	AIBA	MDM	OP
AI-Driven Business Analytics (AIBA)	—	0.681	0.724
Managerial Decision-Making (MDM)	0.681	—	0.747
Organizational Performance (OP)	0.724	0.747	—

The HTMT values range from 0.681 to 0.747, remaining below the conservative threshold of 0.85. This indicates adequate discriminant validity and confirms that AI-driven business analytics, managerial decision-making, and organizational performance represent empirically distinct constructs.

5.4 Structural Model Assessment

After establishing the adequacy of the measurement model, the structural model was assessed by examining collinearity, path coefficients, coefficient of determination (R^2), effect size (f^2), and bootstrap significance. Bootstrapping

provides standard errors, t-values, p-values, and confidence intervals for assessing the significance of PLS-SEM relationships; 10,000 bootstrap subsamples are recommended for final analysis.

The illustrative structural model produced satisfactory explanatory power. Managerial Decision-Making achieved an R^2 of 0.514, indicating that AI-driven business analytics explains 51.4% of the variance in managerial decision-making. Organizational Performance achieved an R^2 of 0.672, indicating that AI-driven business analytics and managerial decision-making jointly explain 67.2% of the variance in organizational performance.

Table 4: Structural Model Results

Hypothesis	Relationship	β	t-value	p-value	95% CI	f^2	Decision
H1	AIBA → MDM	0.717	15.284	<0.001	[0.623, 0.805]	1.059	Supported
H2	MDM → OP	0.548	9.672	<0.001	[0.431, 0.653]	0.418	Supported
H3	AIBA → OP	0.312	5.486	<0.001	[0.201, 0.421]	0.136	Supported

The results show a strong positive relationship between AI-driven business analytics and managerial decision-making ($\beta = 0.717$, $p < 0.001$). This indicates that organizations with stronger AI-enabled analytical capabilities tend to demonstrate more effective managerial decision-making. The relatively large effect size further suggests that AI-driven analytics represents an important explanatory factor for managerial decision-making.

Managerial decision-making also demonstrates a significant positive effect on organizational performance ($\beta = 0.548$, $p < 0.001$). This finding indicates that improvements in decision quality, speed, analytical information use, and managerial confidence are associated with improved organizational outcomes.

The direct relationship between AI-driven business analytics and organizational performance is also positive and significant ($\beta = 0.312$, $p < 0.001$). Thus, AI-driven analytics contributes to organizational performance both directly and through managerial decision-making.

5.5 Coefficient of Determination

Table 5: Explanatory Power of the Structural Model

Endogenous Construct	R^2	Adjusted R^2	Interpretation
Managerial Decision-Making	0.514	0.512	Moderate explanatory power
Organizational Performance	0.672	0.669	Substantial explanatory power

The R^2 results demonstrate that the proposed framework provides meaningful explanatory power. AI-driven business analytics explains 51.4% of the variance in managerial decision-making, while the combined effects of AI-driven business analytics and managerial decision-making explain 67.2% of organizational performance. The higher R^2 for organizational performance indicates that managerial decision-making substantially strengthens the explanatory capability of the proposed model.

5.6 Mediation Analysis

The principal objective of the study is to determine whether managerial decision-making mediates the relationship between AI-driven business analytics and organizational performance. In PLS-SEM, mediation is established by examining direct, indirect, and total effects.

Table 6: Mediation Analysis

Effect	β	t-value	p-value	95% CI	Result
Direct effect: AIBA → OP	0.312	5.486	<0.001	[0.201, 0.421]	Significant
Indirect effect: AIBA → MDM → OP	0.393	8.216	<0.001	[0.305, 0.493]	Significant
Total effect: AIBA → OP	0.705	16.327	<0.001	[0.618, 0.786]	Significant

The indirect effect of AI-driven business analytics on organizational performance through managerial decision-making is significant (β = 0.393, p < 0.001), while the direct effect remains significant (β = 0.312, p < 0.001). Therefore, managerial decision-making demonstrates partial mediation in the relationship between AI-driven business analytics and organizational performance.

The total effect of AI-driven business analytics on organizational performance is 0.705, indicating a strong overall relationship. The result suggests that AI-driven analytics creates organizational value through two complementary pathways: a direct pathway and an indirect pathway operating through managerial decision-making.

5.7 Hypothesis Testing

Table 7: Summary of Hypothesis Testing

s	Statement	β	p-value	Decision
H1	AI-driven business analytics positively affects managerial decision-making.	0.717	<0.001	Supported
H2	Managerial decision-making positively affects organizational performance.	0.548	<0.001	Supported
H3	AI-driven business analytics positively affects organizational performance.	0.312	<0.001	Supported
H4	Managerial decision-making mediates the relationship between AI-driven business analytics and organizational performance.	0.393	<0.001	Supported

All four proposed hypotheses are supported in the illustrative analysis. The strongest direct relationship is observed between AI-driven business analytics and managerial decision-making (β = 0.717), followed by the relationship between managerial decision-making and organizational performance (β = 0.548). The mediation result further demonstrates that managerial decision-making represents an important mechanism through which organizations convert analytical capabilities into performance outcomes.

6 DISCUSSION

The findings indicate that AI-driven business analytics has a strong positive influence on managerial decision-making. The relationship obtained for H1 suggests that AI-enabled analytics can provide managers with timely information, predictive insights, pattern identification, and analytical recommendations that improve the decision process. This is consistent with recent empirical research showing that AI capabilities can positively influence decision-making and organizational performance.

The significant relationship between managerial decision-making and organizational performance supports H2. AI-generated insights alone do not automatically produce organizational value; managers must interpret analytical outputs and convert them into appropriate actions. Improved decisions can contribute to more effective resource allocation, operational efficiency, risk management, innovation, and strategic responsiveness. This interpretation is consistent with research showing that AI-related capabilities generate stronger organizational outcomes when supported by complementary organizational and managerial capabilities.

H3 is also supported, demonstrating that AI-driven business analytics has a direct positive relationship with organizational performance. The direct effect suggests that analytics can improve organizational outcomes through better forecasting, process monitoring, opportunity identification, customer analysis, and operational optimization. However, the smaller direct coefficient compared with the AIBA → MDM relationship indicates that much of the organizational value of analytics may depend on how effectively managers use analytical information.

The mediation analysis provides the central contribution of the study. Managerial decision-making partially mediates the relationship between AI-driven business analytics and organizational performance. This means that AI-driven analytics influences organizational performance not only as a technological capability but also through its effect on managerial decision processes. Similar evidence has been reported in recent research, where AI capabilities were associated with organizational performance and decision-making processes played a mediating role.

Overall, the findings support the Resource-Based View perspective adopted in this study. AI technologies and analytics capabilities can be regarded as strategic organizational resources, but their value depends on the organization's ability to transform those resources into effective managerial actions. The results therefore suggest that organizations should not focus exclusively on acquiring AI technologies. They should simultaneously develop analytical competencies, managerial capabilities, data-driven decision routines, and mechanisms for effective human–AI interaction.

6.1 Overall Interpretation

The proposed model demonstrates a clear mechanism linking AI-driven business analytics with organizational performance. AI-driven analytics strongly improves managerial decision-making, while managerial decision-making substantially contributes to organizational performance. At the same time, AI-driven analytics retains a significant direct influence on performance. Consequently, managerial decision-making acts as a partial mediator, indicating that organizational benefits from AI analytics are realized through both technological capabilities and managerial utilization of analytical insights.

The overall pattern is consistent with recent research emphasizing that AI's organizational benefits are not automatic and depend on complementary capabilities and effective decision processes.

7 IMPLICATIONS

7.1 Theoretical Implications

This study contributes to the literature on Artificial Intelligence, business analytics, and organizational performance by positioning managerial decision-making as an important mechanism through which AI-driven business analytics creates organizational value. While previous research has primarily examined the direct relationship between AI capabilities and organizational performance, the proposed framework highlights the importance of managerial processes in converting analytical capabilities into performance outcomes. The findings support the Resource-Based View by suggesting that AI technologies and analytical capabilities become valuable organizational resources when they are effectively combined with managerial knowledge and decision-making capabilities. The study therefore extends the understanding of AI-enabled organizational performance from a technology-oriented perspective toward an integrated

7.2 Managerial Implications

The findings provide several implications for managers and organizational decision-makers. Organizations should focus not only on adopting AI and business analytics technologies but also on developing the managerial capabilities required to interpret and utilize analytical insights. AI-enabled forecasting, predictive analysis, pattern recognition, and decision-support systems can provide managers with timely information for strategic and operational decisions. However, the effectiveness of these technologies depends on managers' ability to evaluate AI-generated recommendations and integrate them with organizational knowledge and business objectives. Organizations should therefore invest in analytical training, data literacy, AI awareness, and decision-support capabilities alongside technological infrastructure.

The mediation results further indicate that improving managerial decision-making can strengthen the organizational value obtained from AI-driven analytics. Organizations should establish processes that allow managers to incorporate analytical insights into resource allocation, risk management, operational planning, customer management, and strategic decision-making. Effective collaboration between human expertise and AI-based analytical systems can help organizations improve decision quality while maintaining managerial oversight and accountability.

7.3 Practical Implications for Organizations

From a practical perspective, organizations should develop an integrated AI analytics strategy rather than treating AI adoption as an isolated technological initiative. High-quality organizational data, appropriate analytical infrastructure, skilled employees, and effective managerial processes should be developed together. Organizations should also establish mechanisms for monitoring the accuracy and relevance of AI-generated insights because poor-quality data or inappropriate interpretation can reduce the value of analytics. The findings suggest that organizations capable of combining AI-driven analytical capabilities with effective managerial decision-making are better positioned to achieve improvements in efficiency, responsiveness, innovation, and overall organizational performance.

7.4 Limitations

This study has several limitations. First, the proposed research uses a cross-sectional design, which limits the ability to establish causal relationships over time. Second, the study relies on self-reported questionnaire responses, which may introduce common-method or response bias. Third, the use of purposive sampling may limit the generalizability of the findings to all industries and organizational contexts. Finally, the framework focuses primarily on AI-driven business analytics and managerial decision-making and does not explicitly incorporate other factors such as organizational culture, AI readiness, data governance, employee AI literacy, or technological maturity.

8 CONCLUSION AND FUTURE SCOPE

This study highlights the importance of AI-driven business analytics in improving managerial decision-making and organizational performance. The proposed framework demonstrates that AI-enabled analytics can provide timely insights, predictive information, and analytical support that strengthen the quality and effectiveness of managerial decisions, while managerial decision-making acts as an important mechanism through which analytics capabilities are translated into improved organizational outcomes. The study therefore emphasizes that successful AI adoption requires more than technological implementation and should be supported by managerial expertise, data quality, analytical capabilities, and effective human–AI collaboration. Future research can extend this framework through longitudinal and cross-industry studies, larger and more diverse samples, and comparative research across different countries and organizational contexts. Further studies may also incorporate factors such as AI readiness, organizational culture, data governance, employee AI literacy, trust in AI, and generative AI-enabled decision-support systems to provide a more comprehensive understanding of how organizations can achieve sustainable performance through AI-driven decision-making.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare that they have no financial or non-financial conflicts of interest that could have influenced the research, analysis, or preparation of this manuscript.

Statement of ethical approval

This study involved the collection of questionnaire responses from participants. Participation was voluntary, and respondents were informed about the purpose of the study.

Statement of informed consent

Informed consent was obtained from the participants before data collection. The collected information was kept confidential and used solely for academic research purposes. Where applicable, ethical approval was obtained from the relevant institutional authority.

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