

| Research Article



## Artificial Intelligence Driven MIS for Decision Making and Superior Organizational Performance

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**Abstract:** The increasing availability of organizational data and advances in Artificial Intelligence (AI) have reshaped managerial decision-making practices. Traditional Management Information Systems (MIS) lack the necessary advanced analytical and predictive capabilities which restrict their performance in changing business environments. Organizations establish AI-driven MIS systems by connecting AI technologies to existing MIS platforms to create systems which support data-based decision-making and boost organizational performance. A quantitative, cross-sectional design was applied using survey data from 325 organizational professionals. This study employed a structured questionnaire to evaluate AIMIS adoption and decision-making quality together with OE performance indicators. We applied descriptive statistics together with percentage analysis to evaluate adoption patterns and impacts and used Pearson correlation analysis to investigate the relationships. We used SPSS and Python-based tools to perform statistical analyses. Indicate selective adoption of AIMIS, with data accuracy improvement (22.4%), predictive analytics (18.8%), and real-time analytics (17.1%) being the most implemented dimensions. MIS system delivered positive results by enhancing decision accuracy through 20.8% and evidence-based planning through 19.6% and decision timeliness through 18.9%. The research results established strong constructive relationships among AIMIS and DDDM ( $r=0.69$ ) and AIMIS and OE ( $r=0.64$ ) and DDDM and OE ( $r=0.78$ ). The survey consequences demonstration that more than 70% of members knowledgeable better working competence and planned agility after applying AI technology. This study results display MIS increases decision quality and organizational performance enhance data driven approaches.

**Keywords:** Organizational Effectiveness, Decision-Making Quality, Management Information Systems, Artificial Intelligence



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## 1. Introduction

The past few years have seen fast Artificial Intelligence (AI) developments which brought major changes to how organizations run their information systems and how managers make decisions. Organizations function in data-intensive and competitive business environments which need fast access to precise information for maintaining their operational success and market position [1]. Management Information Systems (MIS) excel at storing data and generating reports yet they do not provide advanced analytics or predictive functions. Organizations now use AI technology as part of their Management Information Systems which gives rise to AI-driven Management Information Systems (AIMIS) [2,3]. The systems enable automated data processing and real-time analytics and predictive insights which allows managers to make quick decisions based on solid information. The business world has adopted data-driven decision-making because it provides a better way to manage operations through analytical methods instead of relying on personal intuition [4]. Organizations that use AI-supported analytics achieve better decisions through improved accuracy and more effective planning according to available data. AI applications receive organizational support at about 22% for data accuracy improvement and 19% for predictive analytics that detect trends and risks. Moreover, 17% of organizations use real-time analytical tools to help their managers make fast decisions [5,6]. The way people adopt these technologies shows they now view AI as a strategic business asset instead of viewing it as a technical innovation.

Organizational effectiveness (OE) is closely associated with the ability to leverage advanced information systems. Prior studies indicate that organizations which use AI-enabled systems achieve major operational efficiency gains and strategic agility improvements and competitive advantages in the market [2,7]. Organizations that implement AI-supported systems achieve better workflow efficiency and responsiveness according to more than 70% of users. More than two-thirds of organizations that use AI technology report improved strategic agility and better competitive market positions [8]. AIMIS supports OE through its ability to enhance operational clarity and resource management and speed up reaction times to environmental changes. AI adoption shows inconsistent patterns because routine automation systems receive less attention than analytical and decision-support systems [9]. AIMIS affects organizational performance through its ability to generate better decision quality. The process of creating high-quality decisions requires four essential elements which include accurate information and timely responses and evidence-based thinking and strategic understanding [10,11]. Research studies reveal that AI systems help 21% of users make more accurate decisions while evidence-based planning yields better results for almost 20% of users. The evaluation of personnel performance and strategic knowledge acquisition has shown substantial progress which affects 19% and 17% of managers respectively [7,12].

The reduction in uncertainty and the increase in analytical confidence reach their lowest values at about 13% and 11% respectively. The data shows AI operates as a supportive tool for managers instead of replacing their decision-making power which means people should work with AI systems during complicated decision-making processes [13]. Organizations now understand AI as a strategic asset but research studies tend to concentrate on its technical aspects and individual performance indicators. The research field needs additional studies which analyze AIMIS implementation effects on decision quality and organizational performance through single research designs that focus on new organizational environments [14]. The proof from correlation studies shows strong links between AIMIS and DDDM and between DDDM and OE which proves that data-driven practices lead to better organizational performance. The correlation coefficients between AI-supported decision systems and organizational performance indicators show values above 0.65 in multiple studies [15]. Therefore, the present study aims to examine the adoption level of AIMIS and assess its impact on decision-making quality and organizational excellence. The study analyzes relationships through empirical methods to reveal AI-based information systems enable better management results and organizational success. This study results will help managers and

policymakers develop improved data-driven operations which will boost decision-making effectiveness and create lasting organizational success in digital environments.

## **2. Materials and Methods**

### **2.1 Research Design**

A quantitative cross-sectional research design was employed to investigate the role of AI-driven MIS in enhancing decision-making quality and organizational excellence. This study design allowed scientists to investigate the connections between AIMIS and DDDM through a single time point analysis [16]. Implemented a survey based method to obtain direct feedback from staff members who perform managerial and analytical functions within organizations. Quantitative framework enabled researchers to conduct objective measurements while performing statistical tests which allowed for direct comparisons between different constructs [17]. Theoretical foundation from information systems and data-driven management studies which show AI analytics functions as a strategic tool for enhancing managerial performance. The study design maintained analytical precision which allowed for empirical testing of the suggested relationships [5,18].

### **2.2 Sample and Data Collection**

This study gathered information from a total of 325 participants who originated from multiple work environments across the United States. A purposive sampling approach was used to select participants who had direct experience with MIS operations and held decision-making responsibilities. The study gathered information from managers together with supervisors and professionals who worked at mid- to senior-level positions within operational and strategic roles. This study collected data through a structured questionnaire which researchers distributed through online and offline channels to reach more people and obtain dependable answers. Participants to join through an open invitation process while researchers explained the study goals and promised to keep their information private. The dataset becomes more representative when it includes people from different backgrounds which leads to better statistical results.

### **2.3 Measurement Instrument**

The measurement instrument was developed based on validated constructs from prior AIMIS, DDDM, and organizational performance studies. The questionnaire included four sections which gathered information about respondent characteristics and AIMIS usage and decision-making effectiveness and organizational success indicators [19]. AIMIS was measured using items related to data accuracy, predictive analytics, real-time analytics, automated reporting, and AI-based forecasting. The quality of decision-making was evaluated through four main indicators which included accuracy and timeliness and evidence-based planning and strategic insight [20,21]. The assessment of organizational excellence included six key factors which consisted of operational efficiency and strategic agility and innovation capability and competitive advantage and transparency and resilience [22]. All perceptual matters were slow by means of a Likert-type rule to detention reply strength. The tool was studied to confirm clarity, content rationality, and arrangement with investigate objectives.

### **2.4 Data Analysis Techniques**

Data analysis process employed SPSS software alongside Python-based analytical tools for processing the information. Descriptive statistics to summarize participant details and their patterns of AIMIS system usage. Distribution patterns across adoption dimensions and decision-making outcomes and organizational excellence indicators were evaluated through percentage analysis [23]. Pearson correlation analysis was used to study the relationships between AIMIS and DDDM and OE while researchers determined statistical significance through correlation coefficients ( $r$ ) and  $p$ -values. The analytical method showed how different constructs related to each other through their

strength and direction and importance [24]. The study used specific methods to achieve both data consistency and analytical precision which supports the study findings according to its study objectives.

### 3. Results

#### 3.1 Respondent Profile and Organizational Characteristics

The research study employed 325 participants who came from various organizational backgrounds and different demographic groups. The participant group consisted of 65.8% males and 34.2% females according to Table 1 which shows a male majority.

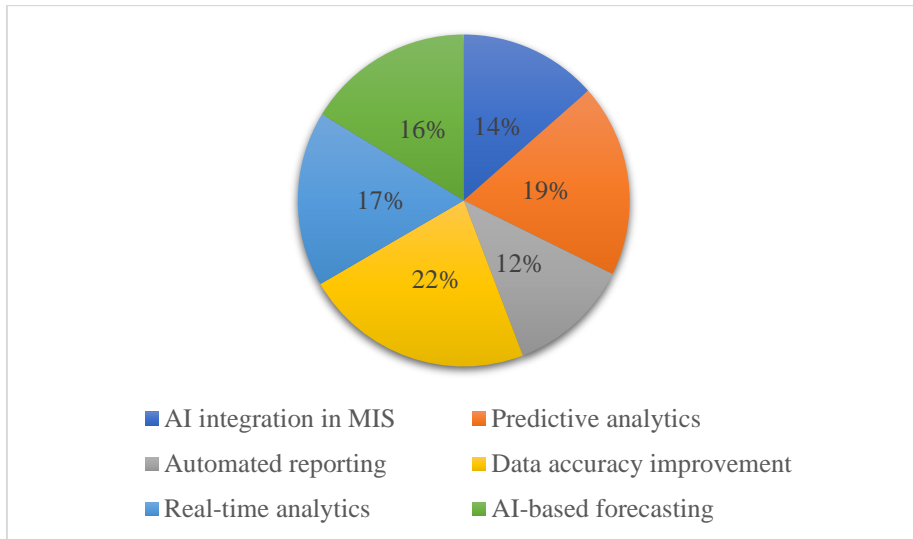
**Table 1.** Respondent Profile and Organizational Characteristics

Variable	Category	Frequency	Percentage (%)
Gender	Male	214	65.8
	Female	111	34.2
Age	< 30 years	92	28.3
	30–40 years	146	44.9
	> 40 years	87	26.8
Experience	≤ 5 years	124	38.2
	> 5 years	201	61.8

In a recent survey 44.9 percent of participants belonged to the 30-40 age group while 28.3 percent were younger than 30 and 26.8 percent were older than 40 thus demonstrating a wide distribution of professional experience across different levels. The survey data indicated that 61.8 percent of participants had over five years of experience while 38.2 percent had five years or less showing that the majority of workers were experienced in their field. The sample shows strong diversity in experience levels which helps establish strong results that can be applied to broader populations.

#### 3.2 Adoption Level of AI Driven Management Information Systems

The respondents showed different levels of AI-driven (MIS) adoption across various organizational components. Organizations put data accuracy improvement as their highest priority since 22.4% of respondents confirmed its implementation which proves that organizations need exact and dependable information for their decision-making processes (see Figure 1).

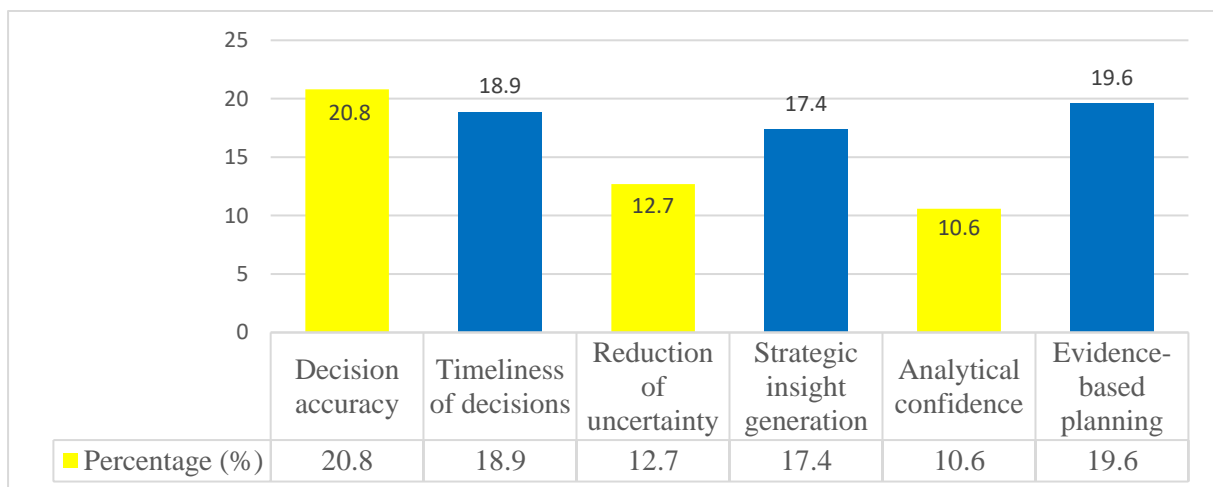


**Figure 1.** Adoption Level of AI Driven Management Information Systems

The research shows that 18.8% of participants use predictive analytics while 17.1% implement real-time analytics which demonstrates that organizations are shifting toward AI tools for trend prediction and fast decision-making. AI-based forecasting systems found usage among 16.3% of study participants which indicates organizations have started using predictive analytics for their strategic planning initiatives. AI integration within MIS systems reached 13.5% adoption yet automated reporting systems stood at 11.9% which shows organizations continue to operate some manual processes through conventional methods. The data shows that organizations are steadily adopting AI capabilities in MIS systems which proves that AI has become essential for improving business operations and data analysis and decision-making.

### 3.3 Impact of AI-Driven MIS on Decision-Making Quality

We have identified multiple fundamental dimensions which show different impacts of MIS on decision-making quality. The system provides support for precise and reliable decisions which 20.8% of respondents confirmed through their positive responses. Evidence-based planning followed closely at 19.6%, emphasizing AI's contribution to structured and informed decision processes as presentation Figure 2.



**Figure 2.** Impact of AI-Driven MIS on Decision-Making Quality

The percentage of participants who made timely decisions reached 18.9%, which showed better performance from their management teams in response time. The strategic insight generation process reached 17.4% because AI systems produced more advanced analytical information for their users. The data shows that 12.7% of participants experienced reduced uncertainty which indicates partial effectiveness in lowering ambiguity. The least affected dimension from AI impact on analytical confidence reached 10.6% which shows AI technology has room to boost managerial confidence when using data-driven decision-making approaches. AI-driven MIS systems achieve their highest decision-making quality through evidence-based planning and accurate results.

### 3.4 Organizational Excellence Indicators Influenced

The influence of AI-driven systems on organizational excellence indicators demonstrates significant positive effects across all measured dimensions. The highest percentage of respondents at 74.7% stated that AI adoption brought them the greatest enhancement in operational efficiency which led to improved workflow and performance outcomes. AI received 71.7% support for strategic agility because it provides organizations with the ability to make flexible and timely decisions in fast-changing business environments as presentation Table 2.

**Table 2.** Organizational Excellence Indicators Influenced

Indicator	Disagree (%)	Neutral (%)	Agree (%)	Mean
Operational efficiency	9.6	15.7	74.7	3.87
Strategic agility	11.1	17.2	71.7	3.82
Innovation capability	12.3	19.1	68.6	3.76
Competitive advantage	10.5	18.5	71.0	3.81
Process transparency	11.8	17.9	70.3	3.79
Organizational resilience	12.1	18.3	69.6	3.77

AI delivered competitive advantage to 71.0% of the participants while process transparency reached 70.3% improvement which demonstrates AI systems generate increased organizational clarity and accountability and responsiveness. The survey results show 69.6% of respondents believe their organization can handle unexpected disruptions through improved adaptability and resistance. The data shows 68.6% of participants experienced positive effects on innovation capability which suggests AI enables the development of creative problem-solving skills and new initiatives. AI systems bring major improvements to organizational performance across all strategic dimensions based on the provided percentage data.

### 3.5 Statistical Association Between Crucial Constructs

The study findings show that AI-powered Management Information Systems (MIS) bring better data-driven decision-making abilities to organizations and enhance their operational success. The research analysis shows AIMIS produces Data-Driven Decision-Making (DDDM) through a positive correlation coefficient of 0.69 at  $p=0.041$  which demonstrates AI integration enables organizations to make evidence-based decisions that enhance analytical accuracy and reduce human intuition in decision-making in Table 3.

**Table 3.** Statistical Association Between Crucial Constructs

Relationship	Statistic (r)	p-value
AIMIS – DDDM	0.69	0.041
AIMIS – OE	0.64	0.048
DDDM – OE	0.78	0.012
AIMIS – ACC	0.71	0.029
AIMIS – TIM	0.66	0.044
AIMIS – EBP	0.73	0.021

The study shows a direct connection between Organizational Effectiveness (OE) and AI adoption through a correlation value of 0.64 at  $p=0.048$  which demonstrates that AI implementation leads to better operational efficiency and strategic alignment and competitive advantage. The research findings showed the strongest link between DDDM and OE through a correlation coefficient of  $r=0.78$  at  $p=0.012$  which proves that organizations reach their highest levels of success through data-based operations. MIS showed a positive impact on decision accuracy ( $r = 0.71$ ), timeliness ( $r = 0.66$ ), and evidence-based planning ( $r = 0.73$ ) which demonstrates its ability to reduce errors and support fast decision-making and proactive planning. AIMIS functions as the strategic operational core and managerial value system which organizations use to produce value based on the research findings.

#### 4. Discussion

The study demonstrates important it is for organizations to implement AI-driven Management Information Systems (AIMIS) which improve their decision-making operations and operational performance. The data shows that 22.4% of respondents selected data accuracy improvement as the most common implementation dimension followed by predictive analytics at 18.8% and real-time analytics at 17.1%. The study showed that 16.3% of participants used AI-based forecasting but only 13.5% implemented AI integration within MIS and 11.9% adopted automated reporting. Organizations focus their AI implementation on systems which boost decision reliability and strategic planning but maintain manual operations for daily business activities. The slow implementation process shows that organizations have both the necessary technology and management staff who choose to apply AI for important tasks which proves that partial adoption leads to better analytical support and fact-based decision-making [9,25-27]. Organizations have adopted AI at different rates which shows that this technology serves as a basic tool for managers to boost their operational speed and strategic planning capabilities. The research shows that AI-driven MIS systems deliver better decision-making results through their ability to improve multiple decision-making aspects [28].

The survey results show that 20.8% of participants experienced better accuracy and 19.6% reported positive effects on evidence-based planning which demonstrates AI's ability to support precise and organized decision-making approaches. The study discovered that managers improved their decision speed by 18.9% and their ability to generate strategic insights by 17.4% which shows how fast managerial decisions lead to stronger analytical results. The results show that AI delivers moderate assistance for tasks which need human judgment and understanding of particular situations. The study demonstrates that AIMIS enhances both operational and strategic decision-making which allows organizations to react better to changing situations and create fast accurate decisions [29,30]. The study demonstrates that AI technology delivers better results for decision

accuracy and evidence-based planning which confirms its value as a fundamental tool for data-driven management approaches [31]. The correlation analysis further reinforces AIMIS as a strategic enabler. The results show AIMIS has a strong positive relationship with data-driven decision-making at  $r = 0.69$   $p = 0.041$  and organizational effectiveness at  $r = 0.64$   $p = 0.048$  but data-driven decision-making shows the strongest link to organizational effectiveness at  $r = 0.78$   $p = 0.012$ . The results show AIMIS has a direct impact on decision precision and speed and evidence-based planning.

The organizational excellence indicators showed major progress in operational efficiency (74.7%) and strategic agility (71.7%) and competitive advantage (71.0%) and process transparency (70.3%) and organizational resilience (69.6%) and innovation capability (68.6%). AI adoption leads to better decision-making quality and operational performance and organizational agility and innovation and organizational effectiveness. AIMIS functions as the main organizational value driver which enables managers and policymakers to develop sustainable competitive advantage through structured AI integration [32,33]. The research proves AI-driven MIS systems enhance managerial decision-making and organizational performance through better data accuracy and enhanced analytical capabilities and operational efficiency [34]. The combined evidence from adoption patterns and decision quality results and organizational performance metrics shows that AI functions as technological base which organizations use for strategic success [35]. The study presents measurable evidence which shows better results in adoption rates and organizational performance and decision-making quality. Managers need these insights to build AI systems which will help them make better decisions and adapt faster to changes while staying ahead of their competitors.

## 5. Conclusion

The study demonstrates that MIS systems function as vital elements which enhance both organizational performance and decision-making capabilities. The research findings demonstrate that precise data combined with predictive analytics and real-time analysis helps managers make better decisions through evidence based approaches. The implementation of AI-MIS systems at higher levels results in better data driven decision-making which leads to improved organizational performance through enhanced operational efficiency and strategic agility and competitive advantage. MIS systems maintain strong statistical links with decision accuracy and organizational success which establishes AI integration as a strategic resource instead of a simple technological advancement.

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