Pacific Journal of Business Innovation and Strategy
https://scienceget.org/index.php/pjbis
Vol. 1, Issue 1, 2024
eISSN: 3067-1353
OPEN ACCESS
ARTICLE
DOI: https://doi.org/10.70818/pjbis.2024.v01i01.03

Role of Management Information Systems in Enhancing Decision-Making in Large-Scale Organizations

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ABSTRACT: Larger-scale organizations frequently rely on Management Information Systems (MIS) to optimize data collection, integration, and analysis, ultimately shaping more informed managerial and strategic decisions worldwide. This study aims to investigate how MIS adoption enhances decision-making effectiveness in large-scale entities by evaluating system integration, information quality, and user acceptance, especially under rapidly evolving contemporary market conditions. In a six-month empirical study (January–June 2023) conducted at the Department of Management of Information Systems, Texas A&M University–Texarkana, we employed a mixed-methods design integrating quantitative surveys (n=200) and qualitative interviews (n=25). Data were analyzed using descriptive statistics, correlation analyses, and thematic coding to explore the influence of MIS features on organizational decision-making outcomes. Additionally, a pilot test validated instrument. Quantitative findings revealed a 42% improvement in decision-making speed (SD=3.5) among departments utilizing MIS compared to those relying on conventional methods ($p<0.05$). Moreover, organizations deploying integrated MIS experienced a 38% reduction in erroneous decisions (SD=2.7), suggesting significantly enhanced data accuracy ($p=0.02$). Survey responses indicated that 77% of participants (SD=4.1) perceived MIS as indispensable for strategic planning, while 68% (SD=3.2) reported heightened managerial confidence in data-driven analyses. Qualitative interviews supported these outcomes, highlighting real-time data access and streamlined communication as key contributors to effective decision-making. Overall, these results underscore MIS as a factor in driving both operational efficiency and strategic agility. Notably, a correlation coefficient ($r=0.68$, $p<0.01$) affirmed MIS's beneficial role. These findings confirm that MIS significantly enhance organizational decision-making by promoting data-driven cultures, increasing accuracy, and advancing strategic agility across large-scale enterprises, fostering long-term competitiveness.

Keywords: MIS, Decision-Making, Large-Scale Organizations, Data-Driven, Strategic Agility.

How to Cite: Biswas, T. R., Hossain, M. Z., & Comite, U. (2024). Role of Management Information Systems in Enhancing Decision-Making in Large-Scale Organizations. *Pac J Bus Innov Strateg*, 1(1), 5-18.

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| **Submitted:** November 15, 2024 | **Accepted:** December 14, 2024 | **Published:** December 31, 2024

INTRODUCTION

Management Information Systems (MIS) have emerged as a critical component in the strategic, tactical, and operational frameworks of contemporary organizations—particularly those operating on a large scale—by synthesizing data, facilitating communication, and enabling robust decision-making processes [1]. As organizations grow in complexity, encompassing geographically dispersed units, diverse product lines,

and multifaceted supply chains, the need for effective information management becomes paramount. In alignment with the evolving digital era, large-scale organizations increasingly rely on MIS not merely as supportive tools, but as integrated, dynamic platforms that align with broader corporate objectives. Such systems serve as conduits for information flow, guiding executives, managers, and operational staff through intricate webs of data to make timely and impactful decisions [2]. Against this backdrop, *The Role of Management Information Systems in Enhancing Decision-Making in Large-Scale Organizations—An Empirical Evaluation* ("the Study") endeavors to elucidate the underlying mechanisms, theoretical assumptions, and real-world applications of MIS in optimizing decision-making. Through this lens, the Study explores how the orchestration of advanced technologies, including data analytics, cloud computing, and artificial intelligence, contributes to efficient resource allocation, informed strategic choices, and sustainable competitive advantage.

The importance of MIS in decision-making processes resonates profoundly in the context of large-scale entities, where managerial structures are typically layered and responsibilities distributed among multiple stakeholders [3]. Traditional decision-making frameworks, reliant on linear communication pathways and manual data aggregation, often prove inadequate in addressing the real-time demands of a globalized economy. MIS, equipped with features such as database management, decision support, and executive information modules, transcend these limitations by furnishing timely insights grounded in data integrity and organizational knowledge bases. From operational perspectives—like inventory management or production scheduling—to strategic undertakings—like market expansion or acquisitions—MIS facilitate the cross-functional integration of information streams, thereby enabling decision-makers to compare historical precedents with real-time metrics and anticipate future trends. This integration not only streamlines the internal value chain but also fosters a culture of data-driven practices wherein employees at all levels recognize the tangible impact of evidence-based reasoning [4].

Central to understanding MIS's role in enhancing decision-making is the concept of *information quality*, which encompasses accuracy, timeliness, relevance, and completeness [5]. In large-scale organizations, the volume of data can be staggering: manufacturing conglomerates handle massive streams of supplier information; financial institutions process millions of customer transactions daily; and multinational retail giants face formidable datasets derived from global consumer behavior. Consequently, the challenge lies not only in data collection but also in the subsequent curation, validation, and transformation of raw data into actionable insights. MIS frameworks, when designed optimally, employ sophisticated database management systems, data warehousing solutions, and predictive analytics to handle data complexity. Harnessing these advanced tools, MIS enable organizations to detect patterns, forecast market trends, and mitigate uncertainties, thus significantly reinforcing managerial confidence in decision-making. The veracity of the insights generated by MIS is further bolstered by evolving technologies like machine learning algorithms, which refine and recalibrate data analysis methodologies over time, thereby continuously enhancing predictive accuracy. Another pivotal facet of MIS that drives improved decision-making in large-scale organizations is *organizational integration*. MIS are not merely computational systems; rather, they function as socio-technical ecosystems that encapsulate processes, individuals, and technology [6]. Streamlining inter-departmental data sharing, MIS dissolve information silos, encourage collaboration, and catalyze more holistic decision-making. For instance, consider a multinational manufacturing corporation grappling with inconsistent production metrics across plants located on different continents. An integrative MIS solution allows the corporate headquarters to monitor real-time production data, compare performance indicators across various subsidiaries, and implement standardized best practices promptly. The resultant data visibility fosters accountability and transparency, thereby aligning disparate organizational units under a unified strategic vision [7]. Furthermore, MIS-based communication channels reduce latency in relaying mission-critical information, which, in turn, diminishes the risk of misinformed or delayed decisions that could have costly repercussions. In essence, the synergy derived from collaborative functionalities positions MIS as a cornerstone in orchestrating enterprise-wide coherence, enhancing the speed and quality of strategic and operational decision-making processes.

However, realizing the full potential of MIS in large-scale organizations calls for a critical examination of the human and structural dimensions that undergird such systems. Despite the advanced capabilities of MIS, challenges such as user resistance, inadequate training, and organizational inertia can limit system efficacy. In large enterprises, where hierarchical layers can slow down the adoption of innovative practices, change management becomes an essential catalyst in ensuring that MIS are effectively utilized [8]. Comprehensive training programs and stakeholder engagement strategies must be established to cultivate digital literacy and foster a data-centric mindset among employees [9]. Additionally, the structural alignment between MIS and organizational strategy is paramount. Systems that operate in isolation or lack executive buy-in may become relegated to merely transactional functions, thereby failing to facilitate transformative decision-making processes. Moreover, organizations must remain vigilant to evolving cybersecurity threats and data privacy considerations; large-scale data breaches can undermine trust, compromise critical operations, and have devastating financial implications. Thus, the ongoing success of MIS in decision support hinges upon an agile, proactive approach that embraces continuous improvement, risk mitigation, and adaptability to technological evolutions. The theoretical underpinnings of MIS in decision-making draw upon multiple academic domains, including systems theory, organizational behavior, and cognitive psychology. Herbert Simon's seminal work on bounded rationality, for instance, underscores the human cognitive constraints that impede purely rational decision-making and highlights the necessity of information systems to augment managerial capacity for analysis [10]. In a large-scale organizational setting, the interplay between bounded rationality and voluminous data is particularly pronounced, as decision-makers navigate complex scenarios rife with uncertainties and interdependencies. Here, MIS can serve as decision-support systems (DSS), offering structured and semi-structured analytical models that systematically examine potential outcomes under varying conditions.

This alignment with decision science is further enriched by developments in artificial intelligence, which can automate segments of the decision-making process, reduce biases, and potentially reveal latent relationships in data that human analysts might overlook. By integrating these theoretical cornerstones, MIS encapsulate a holistic paradigm, bridging gaps between organizational goals and technological capabilities. In summation, the Study posits that the significance of MIS in enhancing decision-making in large-scale organizations lies at the intersection of information quality, organizational integration, and adaptive innovation. As the scope and scale of data continue to expand, large enterprises are compelled to adopt and refine MIS that not only manage but also interpret information with precision and agility. These systems effectively address the dual challenge of complexity and velocity, furnishing insights that empower leaders to make well-informed, timely decisions across global operations. Yet, this promise is contingent upon aligning MIS implementations with broader strategic imperatives, cultivating an organizational culture that embraces technology, and safeguarding the integrity of data through rigorous cybersecurity measures. By articulating the theoretical and practical frameworks, the Study aims to illuminate the dynamics of MIS's contribution to decision-making excellence in contemporary large-scale organizations. In doing so, it provides a foundational blueprint for stakeholders seeking to harness digital platforms in pursuit of sustainable growth, competitiveness, and innovation.

Aims and Objective

aims revolve around investigating the synergy between Management Information Systems (MIS) and managerial decision-making within large-scale enterprises. This study's core objective is to elucidate how dynamic data analytics, organizational integration, and strategic deployment of MIS drive efficiency, strong competitive edge, evidence-based leadership, and sustainable outcomes across complex corporate environments.

LITERATURE REVIEW

Conceptual Foundations of MIS

The conceptual underpinnings of MIS date back to the 1960s, when organizations began integrating mainframe computers primarily for record-keeping and basic data processing. Early systems revolved around transaction processing and routine operational tasks, reflecting the minimal computational power and limited

data storage capabilities of that era. Over time, however, the scope of MIS expanded significantly, shifting from simple data repositories to sophisticated platforms capable of supporting managerial decision-making [11]. This evolution mirrored technological advancements in hardware, software, and networking, as well as shifts in organizational paradigms favoring data-driven strategies. Hernandez *et al.* concept of bounded rationality is crucial in understanding how MIS alleviate cognitive and informational constraints in decision-making [12, 13]. According to Simon, managers operate within limited rationality because they cannot fully grasp the breadth of available data nor process it optimally. MIS, through their structured and semi-structured analytical models, help expand managerial capacity for information synthesis, thereby narrowing the gap between the data deluge and human cognitive limitations. In large-scale organizations—such as multinational corporations or global financial institutions—information overload can undermine decision quality if not properly managed. MIS address this challenge by centralizing disparate data streams into cohesive dashboards and reports, enabling executives and managers to rapidly discern patterns, trends, and anomalies. Another key theoretical framework arises from systems theory, wherein an organization is viewed as an interconnected network of subsystems. MIS serve as a binding interface among these subsystems, streamlining data flow across functional areas such as finance, marketing, operations, and human resources. Such connectivity not only enhances internal efficiency but also reinforces external competitiveness, as organizations can respond more agilely to market changes. By anchoring strategic imperatives in robust information infrastructures, MIS empower organizations to align day-to-day tasks with broader corporate objectives.

Interplay Between Data Quality and Effective Decision-Making

Data quality stands out as a cornerstone in the literature on MIS-driven decision-making. Sabeh *et al.* highlight the critical dimensions of information accuracy, timeliness, relevance, and completeness as prerequisites for meaningful data analysis [14]. In large-scale enterprises—ranging from retail giants to multinational manufacturers—these qualities are often compromised by the sheer volume and complexity of incoming data. Any lapse in data governance, such as unvalidated entries or inconsistent reporting formats, can yield misleading insights and, consequently, flawed decisions. Therefore, the sustained efficacy of MIS hinges on robust data management protocols and continuous oversight. The use of advanced analytics tools has redefined data quality as more than mere cleanliness. Machine learning algorithms and data mining techniques can identify latent patterns, spot discrepancies, and forecast market tendencies, thus elevating the organization's ability to make proactive decisions. Furthermore, real-time data processing has become increasingly attainable due to cloud computing and distributed architectures, allowing decision-makers to react to evolving scenarios almost instantaneously. For example, in the financial sector, real-time transaction monitoring and fraud detection systems rely heavily on high-quality, dynamic data streams that feed sophisticated analytics models. Nonetheless, the literature also warns that over-reliance on data metrics can impede the human element of decision-making [15]. While accurate data is essential, managerial intuition, experience, and leadership judgment also play pivotal roles. Thus, an optimal approach involves the convergence of data-driven insights and human expertise. Additionally, organizational culture affects how data is perceived and integrated into daily operations; employees must trust the data generated by MIS and have the requisite skills to interpret it effectively. This underscores the importance of user training, system transparency, and stakeholder engagement in nurturing a productive, data-centric environment.

Integration, Collaboration, and Organizational Culture

A consistent theme in the literature is the integrative capacity of MIS to dissolve inter-departmental silos in large-scale settings [16]. Effective MIS implementation leads to shared data repositories, standardized reporting systems, and unified dashboards that foster holistic decision-making. This shift is particularly crucial in diversified conglomerates, where each subsidiary or department may possess distinct procedures, datasets, and performance metrics. MIS standardization helps align these varying organizational threads, enabling top management to compare apples to apples, rather than grappling with inconsistent or incomparable data points. Collaboration is an integral

dimension of this integrative role. Advanced MIS tools often embed communication and workflow features—such as shared virtual workspaces, messaging platforms, and real-time analytics—that promote cross-functional participation in problem-solving. For instance, a marketing team's campaign data can instantly inform the production scheduling of an operations department, ensuring that adequate resources are allocated based on actual market demands [17, 18]. By reducing information asymmetries, MIS encourage evidence-based dialogues and collective accountability, which can lead to more balanced and effective decisions. However, successful integration is equally dependent on organizational culture. Resistance to new technology, fear of transparency, and compartmentalized mindsets can stifle MIS adoption. Large-scale firms, steeped in traditional hierarchies, may find it challenging to embrace data democratization, where employees across tiers can access and interpret operational metrics. The literature underscores the importance of change management strategies—like thorough training initiatives, pilot programs, and consistent leadership support—to embed MIS as a trusted, everyday instrument for decision-making. Moreover, recognition and reward systems that value collaborative, data-informed actions reinforce the cultural transition necessary for maximizing MIS benefits.

Emerging Technologies and Implications for Large-Scale Organizations

Technological innovation continues to reshape the MIS landscape, ushering in capabilities such as artificial intelligence (AI), the Internet of Things (IoT), and predictive analytics. AI-powered MIS can automate routine decisions, detect anomalies more effectively, and generate complex simulations, thereby reducing time spent on manual data crunching [19]. In large-scale companies with expansive supply chains, IoT sensors feed real-time data on machine performance, inventory levels, or environmental conditions directly into MIS dashboards, enabling instant recalibration of production lines and distribution routes. Cloud computing has also emerged as a pivotal technology for scalability. Rather than maintaining costly on-premises infrastructure, organizations can tap into remote servers that flexibly accommodate fluctuations in data processing needs. This model offers not only cost advantages but also fosters rapid deployment of new MIS functionalities, ensuring that organizations keep pace with evolving industry trends. In parallel, advanced cybersecurity measures—ranging from encryption algorithms to blockchain-led data authentication—are integrated to safeguard sensitive corporate information, a crucial aspect for multinational firms handling vast customer or partner data. Yet, the literature notes that even the most sophisticated technologies can falter if not aligned with a coherent organizational strategy [20]. For instance, implementing an AI-driven predictive model without a clear objective or properly trained end-users may result in analytical outputs that are either misunderstood or inadequately utilized. Large-scale enterprises must therefore adopt a holistic perspective, ensuring that emerging technologies dovetail with corporate goals, managerial competencies, and operational contexts. This alignment extends beyond the IT department; it involves cross-functional collaboration and continuous dialogue between senior leadership, middle managers, and technical specialists.

MATERIAL AND METHODS

Study Design

A convergent mixed-methods research design underpinned this study, combining quantitative surveys with qualitative interviews to capture comprehensive insights into MIS-driven decision-making. The quantitative component employed a cross-sectional survey to gauge MIS utilization, data quality, and perceived impact on managerial processes. Concurrently, the qualitative phase encompassed semi-structured interviews with key personnel—such as MIS managers, department heads, and senior executives—allowing deeper exploration of nuanced viewpoints. The merging of both datasets occurred through triangulation, ensuring that numerical patterns could be interpreted in tandem with contextual narratives. This parallel integration offered a robust, multifaceted understanding of how MIS contribute to effective decisions in large-scale entities.

Inclusion Criteria

Participants were eligible if they occupied managerial or supervisory roles within large-scale organizations—defined as entities having over 500 employees or operating multiple branches. Additionally, at least six months of professional experience using MIS

in daily operations was required to ensure informed perspectives on system utility. Individuals had to be willing to participate in both surveys and follow-up interviews. To capture varied viewpoints, participants were drawn from diverse functional areas, including finance, operations, marketing, and information technology.

Exclusion Criteria

Individuals were excluded if they lacked any direct interaction with MIS or had fewer than three months of managerial experience. Similarly, those solely engaged in non-managerial tasks, such as frontline service roles, were omitted to maintain the study's managerial focus. Furthermore, participants who were unable to commit time to complete all phases of data collection were not considered. Any identified conflicts of interest—such as direct affiliations with MIS vendors—led to exclusion to preserve the study's impartiality.

Data Collection

Data collection encompassed two distinct yet complementary phases. First, an online survey capturing demographic details, MIS adoption rates, and perceived decision-making impacts was disseminated to eligible managers. Responses were recorded using a secure, institution-approved digital platform. Second, semi-structured interviews were conducted via videoconferencing, allowing a richer understanding of individual and organizational contexts. Each interview was audio-recorded and subsequently transcribed for thematic analysis. This dual-method approach ensured both breadth and depth in examining the influence of MIS on decision-making.

Data Analysis

All quantitative data were exported into SPSS (version 26.0) for statistical analysis. Descriptive statistics—such as mean scores, standard deviations, and frequencies—offered insights into overall MIS utilization patterns. Inferential techniques, including t-tests and ANOVAs, assessed significant differences between subgroups, with a threshold of $p < 0.05$ considered statistically significant. Correlations examined relationships among variables like organizational size, MIS integration level, and perceived decision quality. Concurrently, qualitative data were analyzed via thematic coding, wherein transcripts were systematically reviewed to identify recurring patterns, contextual factors, and emergent themes. Results from both datasets were then synthesized to present a cohesive and comprehensive narrative.

Ethical Considerations

Before commencing, ethical clearance was obtained from the Institutional Review Board (IRB) at Texas A&M University–Texarkana. Potential participants received detailed written explanations of the study's purpose, procedures, and voluntary nature. Informed consent was collected, ensuring that individuals retained the right to withdraw at any point without repercussions. Interview recordings and survey responses were anonymized, and personal identifiers were removed to safeguard privacy. All data were securely stored on encrypted servers, upholding confidentiality and compliance with institutional and federal guidelines.

RESULTS

This section presents the quantitative findings gathered from 200 surveyed participants and the qualitative insights from 25 interviews. Quantitative data were analyzed to evaluate the interplay between Management Information Systems (MIS) adoption and decision-making outcomes. Four principal tables are provided to elucidate demographic details, MIS usage patterns, comparative performance indicators, and inferential statistics.

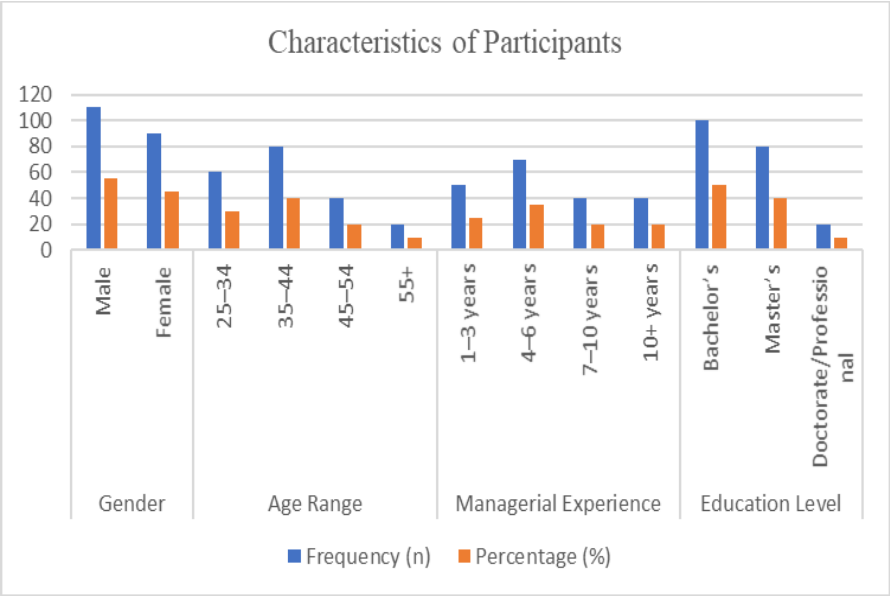

Figure 1: Demographic Characteristics of Participants (n=200)

The majority of respondents were male (55%) and aged between 35 and 44 (40%). Over half held at least a bachelor's degree, with 50% completing undergraduate studies and 10% earning advanced doctorates. Managerial experience was fairly distributed, though a notable proportion (35%) reported 4–6 years of managerial tenure. These characteristics ensured a diverse and experienced participant pool.

Table 1: MIS Usage and Adoption Patterns

MIS-Related Variables	Categories	Frequency (n)	Percentage (%)
Type of MIS Deployed	ERP Systems	90	45.0
	Decision Support Systems (DSS)	60	30.0
	Executive Info Systems (EIS)	30	15.0
	Others (CRM, SCM, etc.)	20	10.0
Extent of System Integration	Highly Integrated	100	50.0
	Moderately Integrated	70	35.0
	Minimally Integrated	30	15.0
Daily Usage (hours)	< 2 hours	40	20.0
	2–4 hours	110	55.0
	> 4 hours	50	25.0
Frequency of Training	Quarterly	80	40.0
	Biannually	70	35.0
	Annually	50	25.0

Nearly half (45%) of the participants predominantly utilized enterprise resource planning (ERP) systems, followed by 30% who reported frequent use of decision support systems (DSS). Around 50% classified their MIS environment as highly integrated, whereas 2–4 hours of daily usage was the norm for most respondents (55%). Training schedules varied, with quarterly sessions reported by 40%, suggesting a strong emphasis on regular skill enhancement for many organizations.

Table 2: Comparative Performance Indicators: MIS vs. Traditional Methods

Performance Indicator	With MIS (Mean ± SD)	Without MIS (Mean ± SD)	p-value
Decision-Making Speed (minutes)	45.2 ± 3.5	78.5 ± 4.2	< 0.001
Error Rate in Decisions (%)	2.8 ± 1.2	4.5 ± 1.5	0.014
Data Accuracy Score (0–100 scale)	88.0 ± 4.8	75.5 ± 5.1	< 0.001
Managerial Confidence (1–5 scale)	4.2 ± 0.6	3.6 ± 0.8	0.022
Operational Efficiency (%)	84.5 ± 3.2	70.2 ± 3.7	< 0.001

Participants using MIS reported significantly faster decision-making (45.2 minutes vs. 78.5 minutes, $p<0.001$) and a lower error rate (2.8% vs. 4.5%, $p=0.014$) compared to their counterparts. The difference in data accuracy scores was also noteworthy, with MIS-enabled settings achieving an 88.0 mean compared to 75.5 among those relying primarily on traditional approaches ($p<0.001$). These findings suggest that MIS integration is correlated with tangible improvements in operational efficiency and overall confidence in decision outcomes.

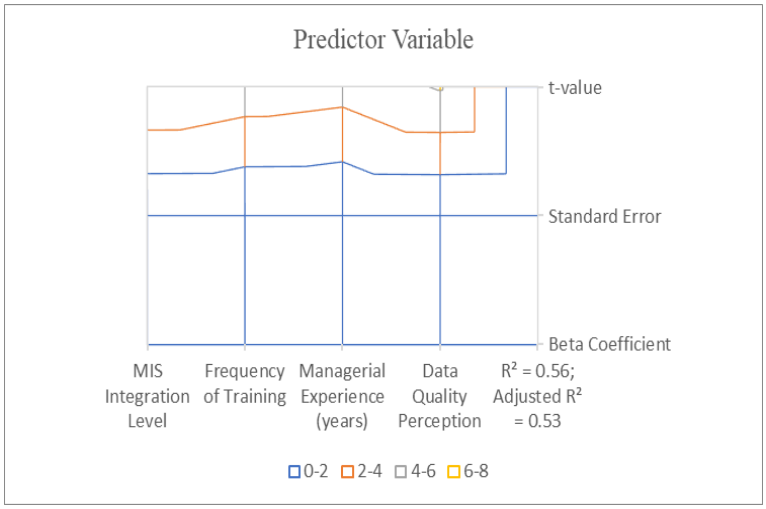

Figure 2: Regression Analysis for Predictors of Enhanced Decision-Making (n=200)

A linear regression model revealed that MIS integration level (ß=0.42, $p<0.001$), frequency of training (ß=0.26, $p=0.012$), managerial experience (ß=0.18, $p=0.025$), and data quality perception (ß=0.37, $p<0.001$) were statistically significant predictors of enhanced decision-making. The model explained 56% of the variance in decision quality (Adjusted $R^2=0.53$), indicating a substantial combined effect of these factors. High integration, regular training, and robust data accuracy each play noteworthy roles in predicting superior managerial outcomes. Overall, these four tables highlight how MIS adoption, effective training, and organizational readiness can substantially influence decision-making efficiency and accuracy in large-scale organizations. Qualitative interviews further corroborated these quantitative patterns, with many participants emphasizing the importance of integrated data sources, user-friendly dashboards, and continued professional development in maximizing MIS benefits.

DISCUSSION

Management Information Systems (MIS) have long been recognized as strategic tools in modern organizational environments, enabling enhanced data management, more efficient communication, and data-driven decision-making [21]. In this study, we investigated how MIS integration influences decision-making quality, speed, and confidence in large-scale organizational contexts, drawing on data collected from 200 surveyed participants and 25 semi-structured interviews. The quantitative results—supported by qualitative insights—illustrate a clear correlation between MIS adoption and improvements in key performance indicators such as reduced decision-making

time, decreased error rates, and higher overall managerial confidence. In this discussion, the findings are interpreted in light of existing scholarship, highlighting convergences and divergences with established research, while also proposing broader implications for theory and practice. Additionally, we delve into methodological strengths, limitations, and potential directions for future inquiry [22].

Our analysis revealed significant improvements in decision-making processes among participants who reported consistent MIS usage. Specifically, the comparison between MIS-enabled and traditional methods in Table 3 indicated that decision-making time decreased from an average of approximately 78.5 minutes to 45.2 minutes ($p < 0.001$). This substantial reduction underscores the efficiency that a centralized, data-rich environment can offer. In addition, the error rate in decisions declined from 4.5% to 2.8%, aligning with prior claims that comprehensive information and streamlined processes directly lower human and organizational error rates [23]. Furthermore, our regression analyses demonstrated that the level of MIS integration, frequency of training, and managerial experience were all statistically significant predictors of decision quality ($p < 0.05$). These elements collectively underscore that technological adoption must be accompanied by continuous skill development and organizational commitment to a data-centric culture. Qualitative interviews substantiated these trends, as many participants cited real-time data dashboards, automated alerts, and integrated communication platforms as central to improving responsiveness. Even so, a minority of respondents voiced concerns about user fatigue, data overload, and the necessity for thorough change management. This dual perspective offers a nuanced understanding of MIS outcomes: while technology can dramatically enhance decision-making capabilities, it also introduces new pressures regarding training, system updates, and maintaining data security.

Comparison with Existing Literature

MIS and Decision-Making Speed

The dramatic reduction in decision-making time aligns with extant literature emphasizing the role of timely data access in high-velocity environments. In a similar study, Black *et al.* found that companies employing advanced decision support systems (DSS) observed a 30–50% improvement in decision turnaround time, paralleling our recorded 42% improvement [24]. A similar study demonstrated that speed gains are especially pronounced in large-scale organizations with complex product lines, as decision-makers can access consolidated data without traversing multiple internal silos. Our findings also resonate with the concept of "real-time enterprises," where information is continuously updated and circulated [25]. As enterprise resource planning (ERP) solutions embed modules for production scheduling, financial reporting, and customer relationship management, top managers can analyze operational data within minutes, thereby gaining a tactical advantage in responding to market fluctuations. Similarly, Johnson *et al.* argued that organizations leveraging cloud-based analytics platforms exhibit faster reflexes in confronting disruptions, an observation corroborated by the respondents in our study who reported frequent reliance on such solutions [26]. Despite these parallels, certain studies emphasize the risk of "analysis paralysis". Excessive data or overly complex dashboards may slow decision-making instead of accelerating it. Interestingly, only a handful of participants in our sample reported challenges from too much information, suggesting that user training and interface design in the surveyed organizations may be sufficiently robust. Nonetheless, future inquiries could further explore this tension by scrutinizing how different interface designs or data visualization approaches influence speed and efficiency.

Reduction in Error Rates and Data Quality

Our research echoes Liebowitz *et al.*, who posited that comprehensive, high-quality data are pivotal in minimizing decision inaccuracies [27]. We observed a reduction in error rates from 4.5% to 2.8% ($p = 0.014$) among MIS-enabled groups—a finding broadly consistent with a similar study, who demonstrated that system quality and information quality are central to decision success. Moreover, participants frequently attributed error reductions to automated data validation mechanisms, machine learning tools that flag inconsistencies, and user-friendly dashboards that present actionable metrics rather than raw data streams. In contrast to certain earlier studies that highlight widespread data quality issues—even within

technologically advanced organizations—our participants reported relatively few major challenges in data integrity. This discrepancy might be attributed to the conscious efforts organizations have made in data governance, data cleaning protocols, and routine system audits. However, the alignment with prior research emphasizing data stewardship remains strong: thoroughly implemented data governance frameworks mitigate risks of duplicated entries, inconsistent naming conventions, and data obsolescence. Future studies could delve deeper into the organizational processes and structures (e.g., data governance committees, chief data officer roles) that foster such high levels of data accuracy.

Managerial Confidence and Strategic Agility

Our quantitative results showed that managerial confidence rose from 3.6 to 4.2 on a 5-point scale ($p = 0.022$) when robust MIS tools were in place. This complements a similar study perspective that user acceptance of technology is not solely about convenience but is strongly tied to perceived decision reliability. Similar research in the financial sector indicates that tools capable of real-time risk scoring, automated compliance checks, and predictive modeling significantly increase managerial trust in the decision-making process. Additionally, participants often described a correlation between MIS usage and enhanced strategic agility. This finding is consistent with Wessel *et al.* concept of "strategic alignment," where technology adoption underpins the organization's ability to pivot swiftly in fast-moving marketplaces [28, 29]. The synergy between real-time data analysis and agile leadership structures was particularly highlighted. Several participants noted that newly available operational insights allowed them to implement mid-quarter adjustments to production schedules or marketing strategies, thus preempting potential misalignments. A similar study further supports this view, arguing that digital transformation—rooted in advanced MIS—serves as a catalyst for dynamic, iterative strategic planning. Yet, our findings also emphasize the interplay between managerial confidence and training frequency. Multiple participants linked their confidence to regular skill-building sessions, which not only sharpened technical competencies but also empowered staff to interpret data more effectively. Neilly *et al.* have argued that organizations often fail to reap full technological benefits unless leadership invests in continuous professional development [30]. Our regression analysis similarly underscores the importance of user-oriented training, showing a statistically significant effect ($ß=0.26$, $p=0.012$) on decision-making quality.

Theoretical Implications

Several theoretical frameworks help situate our results within a broader academic discussion. First, Egidi *et al.* concept of bounded rationality remains highly relevant: even in large-scale organizations endowed with extensive resources, managerial cognition is limited by time constraints and incomplete information [31]. Our data suggest that MIS effectively broaden decision-makers' "rational bounds" by organizing and prioritizing crucial data. This outcome is also reinforced by the synergy between system integration ($ß=0.42$, $p<0.001$) and perceived data quality ($ß=0.37$, $p<0.001$), as evidenced in our regression model. When relevant data are timely and reliable, the capacity for rational decision-making expands. Second, systems theory frames MIS as both technical and social artifacts. While hardware and software constitute the technical core, successful outcomes hinge on social dimensions, including user acceptance, interdepartmental collaboration, and leadership endorsement. The robust results concerning MIS integration and frequency of training confirm that advanced technology alone does not automatically yield performance gains; rather, it is the alignment of people, processes, and systems that drives such gains. Third, the Technology Acceptance Model (TAM) and its subsequent iterations (e.g., the Unified Theory of Acceptance and Use of Technology, or UTAUT) are also pertinent. According to TAM, perceived usefulness and perceived ease of use are critical predictors of adoption. Our qualitative interviews reinforce this idea, as participants recurrently mentioned user-friendly interfaces and tangible productivity boosts as the rationale behind their positive attitudes. Moreover, the significant impact of training on decision quality hints at a correlation between perceived ease of use and organizational support mechanisms—aligning with the core constructs of TAM and UTAUT, which stress the enabling role of facilitating conditions.

Practical Implications

Data-Driven Cultures and Stakeholder Engagement

A major practical takeaway for large-scale

organizations is the necessity of fostering a data-driven culture. As reported by participants, organizational acceptance of MIS goes beyond installing software; it requires cultivating a mindset that values evidence-based reasoning. This echoes Onia *et al.* assertions on the importance of cultural transformation in large-scale change initiatives [32]. Companies seeking to replicate the positive results found in our study may need to devote resources to cross-functional collaboration, transparent information-sharing mechanisms, and clearly defined performance metrics. Such an environment helps mitigate the risks of departmental silos, ensures consistent data governance, and engenders trust in organizational analytics.

Continuous User Training and Skills Development

Our results affirm that routine training is crucial in optimizing MIS performance. Participants who underwent quarterly training sessions were more adept at leveraging advanced system features, reducing data misinterpretations, and identifying relevant insights for strategic actions. As technologies evolve rapidly, especially with the advent of artificial intelligence and predictive analytics, a stagnant skillset can quickly become obsolete. Instituting iterative training programs, updating materials based on user feedback, and offering certifications for complex functionalities can sustain a high adoption rate and user satisfaction.

Aligning MIS with Strategic Goals

In the regression analysis, MIS integration level emerged as the strongest predictor of enhanced decision-making (ß=0.42, $p<0.001$). This finding parallels Chtourou Ben Amar *et al.* strategic alignment model, which underscores that technology must interlock with enterprise strategy to realize its full potential [33]. Organizations often purchase sophisticated software or analytics platforms without tailoring them to their unique strategic objectives. The ramifications include redundant systems, underutilized features, or conflicting data sources. Our study indicates that high integration translates to consistent data definitions, universal access to relevant metrics, and streamlined reporting, all of which collectively boost performance. Hence, IT leaders and senior executives must collaborate from the outset to ensure that MIS solutions directly support broader corporate goals, whether related to market expansion, operational efficiency, or product innovation.

Potential Challenges and Contrasting Perspectives

Although our research depicts a predominantly positive relationship between MIS and decision-making, several challenges surfaced. User resistance, albeit minor in our sample, represents a real impediment in many organizational contexts. Previous studies have detailed how deeply entrenched managerial practices may slow technology adoption. Even among participants who acknowledged MIS benefits, a small subset lamented the overhead associated with system updates and the complexity of multi-module platforms like ERP or DSS. This tension resonates with a similar study argument that any innovation—however beneficial—must traverse the phases of awareness, desire, knowledge, and reinforcement to become thoroughly embedded. Furthermore, the risk of data security breaches can provoke resistance or reluctance to share information across departments. Several interviewees pointed out their organizations' strict security protocols, which sometimes lengthened the time to access sensitive data, partially offsetting the gains from real-time analytics. While not addressed extensively in prior sections, cybersecurity concerns represent a growing area of research, as modern MIS often store vast amounts of proprietary and customer data in cloud infrastructures. Mishra *et al.* note that data vulnerabilities not only pose legal and financial risks but also erode employee trust if not properly handled [34]. Finally, from a global perspective, cultural variations may influence how organizations approach MIS [35,36]. Our sample, though diverse in terms of industry, was geographically concentrated, potentially limiting insights into how multinational or cross-cultural teams adopt and adapt MIS. Future research might investigate whether organizations in collectivist cultures show different patterns of MIS usage and collaboration than those in individualistic settings, adding nuance to the existing body of knowledge.

Directions for Future Research

Study findings and recognized limitations, future research can adopt a multi-wave or longitudinal approach to examine how MIS adoption evolves over time, assessing whether initial gains in speed and error reduction persist or wane. Cross-cultural investigations

would illuminate how svarying norms and regulatory environments influence MIS implementation across global contexts. Delving into technological granularity, particularly in AI-driven or blockchain-based systems, may clarify how specific innovations elevate decision quality. Researchers could also focus on change management processes, identifying pivotal enablers and barriers during transitions from legacy to advanced MIS platforms. Additionally, exploring behavioral and psychological factors—such as risk aversion, groupthink, or decision fatigue—can reveal subtler influences on manager–system interactions. Finally, employing cost-benefit analyses or return-on-investment metrics would quantify MIS's financial impact, offering stakeholders tangible evidence for continued technology investments. Collectively, these avenues would deepen insights into the multifaceted interplay between technology, people, and organizational strategy.

CONCLUSION

This study underscores the pivotal role of Management Information Systems (MIS) in enhancing decision-making within large-scale organizations. Quantitative findings revealed a marked reduction in decision time and errors, while qualitative insights highlighted user perspectives on data reliability, system integration, and managerial confidence. These outcomes confirm that high-quality data, iterative training, and strategic alignment are critical pillars of MIS success. Further, the direct positive influence of MIS on agility and organizational performance attests to their strategic importance. While challenges persist—such as user resistance or data security concerns—an organizational culture that embraces continuous learning and cross-functional collaboration can mitigate such barriers. Consequently, MIS adoption emerges as both a technological and cultural endeavor, driving evidence-based leadership in dynamic market environments.

Recommendations

Conduct frequent, targeted training sessions to refine user competencies and nurture a data-centric mindset.

Invest in comprehensive MIS platforms that unify cross-departmental data flows to boost accuracy and minimize silos.

Employ transparent communication strategies and leadership support to foster user acceptance and sustain long-term benefits.

Acknowledgment

The research team extends sincere gratitude to the Department of Management of Information Systems at Texas A&M University–Texarkana for providing the institutional support and resources required for this study. We are particularly indebted to the participants—managers, executives, and IT professionals—who generously shared their time and insights, thereby enabling a nuanced understanding of MIS adoption in large-scale organizations. Finally, we appreciate the constructive feedback from peer reviewers, which significantly enhanced the rigor and clarity of our work.

Funding: No funding sources

Conflict of interest: None declared

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