PATHFINDER PUBLISHER

RESEARCH SUSTAINABILITY

RESEARCH SUSTAINABILITY
AN INTERNATIONAL, OPEN-ACCESS AND INTERDISCIPLINARY JOURNAL
PATHFINDER PUBLISHER

Review Research

Artificial Intelligence Driven Management Information Systems for Enhancing Social Equity, Economic Sustainability and Managing Costs and Challenges

Proggo Choudhury [1*], Md Sharfuddin [2], Khandokar Mursalin Ahmed [3], Kulsuma Begum [4]

[1] Department of Master of Business Administration, North South University, Dhaka, Bangladesh.
[2] Department of Master of Business Administration, International American University, Los Angeles, CA, United States
[3] Sylhet Engineering College, Sylhet-3100, Bangladesh
[4] Pathfinder Research & Consultancy Center, United States

Abstract: Artificial Intelligence driven Management Information Systems are reshaping organizational practice by improving efficiency, promoting social equity, and strengthening economic sustainability. Compared with traditional MIS that often struggle with large scale data handling and fair decision processes, AI enabled systems provide adaptive analytics that optimize resource allocation and decision support. This study used a cross-sectional survey of 350 respondents from diverse organizational sectors in the United States to evaluate AI based MIS performance across three domains, operational efficiency, social equity, and sustainable economic outcomes, alongside cost considerations and barriers to implementation. Data were analyzed with descriptive statistics, correlation, regression, and chi square (χ^2) tests. Results indicate notable efficiency gains, with 72 percent of respondents reporting faster decision making (β = 0.54, r = 0.61). Equity indicators improved, as 68 percent observed fairer distribution of resources (β = 0.48, p = 0.01, r = 0.57). Economic sustainability also advanced, with 65 percent citing cost savings and more efficient use of inputs (β = 0.51, r = 0.59). Implementation challenges were common, reported by 54 percent of organizations, and were linked to technical integration, workforce training, and data privacy concerns (χ^2 = 28.7, p = 0.001). Overall, higher AI readiness was associated with fewer obstacles and stronger benefits. The findings suggest that AI driven MIS can meaningfully elevate operational performance while supporting equitable and sustainable outcomes, provided that organizations invest in integration capacity, staff upskilling, and robust data governance.

Keywords: Economic Sustainability, Management Information Systems, Social Equity, Challenges, Costs, Efficiency

Article History:
Received: 05 February 2024
Accepted: 12 April 2024
Online: 15 April 2024

Corresponding author:
proggoc@gmail.com

Citations: Choudhury, P., Sharfuddin, M., Ahmed, K. M. & Begum, K. (2024). Artificial Intelligence Driven Management Information Systems for Enhancing Social Equity, Economic Sustainability and Managing Costs and Challenges. *Research Sustainability*, *1*(1), 37-50.

https://doi.org/10.69937/pf.rs.1.1.62

1. Introduction

Organizations across the United States are increasingly adopting Artificial Intelligence driven Management Information Systems to raise operational efficiency while advancing social equity and long-term economic sustainability (**Goralski & Tan, 2019**). Conventional MIS platforms still handle core data storage and routine reporting, yet they often fall short when confronted with high velocity data streams, complex decision contexts, and the need to distribute resources fairly across units and teams (**Zhao & Fariñas, 2022**; **Alami et al., 2020**). Survey evidence from 2023 indicates that 68 percent of organizations encountered limitations with traditional MIS for strategic decision support, prompting a turn toward AI enabled alternatives. In contrast, AI driven MIS integrate machine learning, predictive analytics, and intelligent data pipelines to optimize processes in real time and deliver targeted insights that scale with organizational complexity (**Truby, 2020**).

Emerging findings from multiple U.S. industries during 2023 suggest that AI based MIS can raise efficiency substantially, with reported improvements in decision speed and process throughput reaching as high as 72 percent through automation of routine tasks, anomaly detection, and rapid analysis of streaming data. These gains arise from three reinforcing capabilities. First, AI models can filter noise and prioritize high salience information, allowing managers to act quickly on the indicators most likely to alter outcomes. Second, predictive components anticipate demand, bottlenecks, and risk, enabling earlier interventions that reduce waste and delays. Third, feedback loops continuously recalibrate recommendations as new data arrive, keeping performance aligned with shifting conditions (**Truby, 2020**).

Beyond efficiency, organizations are leveraging AI MIS to support more equitable access to information and resources. By standardizing decision criteria and making data products broadly available through dashboards and alerts, these systems can reduce gatekeeping and mitigate idiosyncratic discretion that sometimes disadvantages teams or staff. Evidence from implementations of 2023 shows that organizations realized a 64 percent improvement in balanced work allocation and more even participation in decision processes across units. This pattern aligns with the promise that transparent analytics, common data vocabularies, and algorithmic auditing can widen inclusion and counter biases in resource distribution (**Chen et al., 2020**; **Xiang et al., 2020**). While AI cannot eliminate all structural inequities on its own, the architecture of AI MIS makes it possible to surface disparities, track corrective actions, and institutionalize fairer rules of engagement.

Economic sustainability has also emerged as a prominent outcome. Organizations report lower operating costs through streamlined workflows, intelligent scheduling, and smarter utilization of assets, while simultaneously curbing waste in energy, inventory, and labor allocation. In 2023, adopters documented an average 7 percent reduction in operating expenses, accompanied by productivity gains and steadier throughput. These improvements reflect the ability of AI MIS to link financial planning with granular operational telemetry, enabling spending decisions that are both data driven and resilient over time (**Fatima et al., 2020**). Moreover, by tracking energy consumption and supply chain performance in detail, AI systems can identify opportunities to reduce environmental impacts and to comply more reliably with evolving social and regulatory expectations

(**Elliott et al., 2021**). In practice, sustainability is operationalized through automated measurement, exception detection, and scenario analysis embedded in day-to-day management routines.

Despite these benefits, implementation is rarely frictionless. Organizations frequently encounter three categories of obstacles. Upfront costs can be significant once data engineering, model lifecycle tooling, and change management are included. Technical integration poses additional hurdles when legacy systems lack interoperability or when data quality issues undermine model performance. Finally, workforce readiness is uneven, making training and role redesign essential to realize value from new analytics capabilities. In 2023, 54 percent of surveyed organizations reported at least one of these barriers, commonly citing infrastructure adaptation, exposure to cybersecurity threats, and challenges in preparing employees for AI augmented decision work (**Gupta et al., 2021**). These findings highlight the importance of governance frameworks that define model purpose, monitoring, and accountability; phased rollouts that limit risk; and continuous learning programs that build literacy in data interpretation and human machine teaming.

Organizational preparedness appears to moderate both the difficulty of adoption and the magnitude of benefits. Entities with clearer data strategies, stronger leadership sponsorship, and established pathways for stakeholder engagement reported smoother deployments and more durable performance gains. This relationship underscores the role of deliberate planning, early alignment on use cases, and investment in human capital as prerequisites for successful integration of AI into management functions (**Richey et al., 2023**).

Against this backdrop, the present research investigates how AI driven MIS influence efficiency, equity, and sustainability within U.S. organizations, drawing on responses from 350 participants who engaged with such systems during 2023 (**Tsolakis et al., 2022**). The study documents the scope of operational improvements, the mechanisms through which more equitable practices are supported, and the extent of cost and environmental benefits realized in routine operations. It also catalogues the direct and indirect expenses associated with adoption, along with the obstacles that most frequently impede progress. By consolidating these insights, the research offers evidence that can guide executives, policymakers, and technology partners in steering AI deployments toward management transformation, fairer workplace dynamics, and durable economic outcomes. The central objective is to clarify how AI MIS reshape performance and governance, and to specify the cost profiles and barriers that organizations must anticipate in order to design pragmatic, responsible, and effective adoption strategies (**Zhao & Fariñas, 2022**).

2. Review Methodology

2.1 Study Design and Setting

This research adopted a cross-sectional survey design to examine how Artificial Intelligence driven Management Information Systems influence organizational efficiency, social equity, and economic sustainability across the United States. Data were collected between 2023 and 2024 from public, private, and nonprofit organizations operating in diverse industrial sectors. The objective was to capture prevailing perceptions regarding AI MIS implementation, its operational benefits, and related challenges. To ensure representativeness, organizations of varying sizes and operational scopes were included, enabling the identification of distinctive trends in performance enhancement, fair resource allocation, and sustainable management. The research design made it

possible to explore sectoral differences in adoption outcomes and reveal the key barriers influencing integration. By examining multiple organizational environments, the study achieved a holistic understanding of how AI based MIS functions across different operational contexts. The cross-sectional approach provided a comparative overview across departments and sectors, offering a snapshot of AI MIS effectiveness under real world conditions (**Budhwar et al., 2023**). This design further supports the generalization of findings to similar organizational contexts and assists in formulating evidence-based adoption strategies.

2.2 Respondents and Sampling

A total of 350 participants took part in the study, consisting of managers, IT specialists, and decision makers directly involved in MIS operations. Participants were selected through stratified random sampling to guarantee balanced representation across departments, hierarchical levels, and industrial sectors. Eligibility required a minimum of twelve months of professional experience working with MIS systems. Demographic information such as organizational size, sector, and participant designation was collected to establish a contextual background for interpreting results. Stratification ensured equal inclusion of public, private, and non profit institutions, thereby allowing comprehensive assessment of adoption experiences and outcomes. The sample composition provided a sound basis for analyzing how AI MIS implementation influences performance, fairness, and sustainability outcomes. Both managerial and operational staff perspectives were integrated to identify obstacles related to system integration, user training, and data protection.

2.3 Data Collection and Analysis

Primary data were obtained using a structured questionnaire that measured perceptions of organizational efficiency, social equity, economic sustainability, and the costs and barriers associated with AI MIS adoption. Responses were rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Data were processed and analyzed with SPSS version 28 (**Addison & Jenkins, 2023**). Descriptive statistics including means, standard deviations, and percentiles were used to summarize participant responses. To examine relationships among variables, three statistical techniques were employed: correlation coefficients to identify associations, regression analysis to determine effect sizes, and chi square (χ^2) tests to explore relationships between categorical indicators of organizational readiness and implementation challenges (**Mitra, 2023**; **Nguyen et al., 2022**). Statistical significance was determined at $p \leq 0.05$. Ethical standards were maintained by obtaining informed consent, ensuring voluntary participation, and protecting anonymity. The questionnaire was pretested to confirm clarity, reliability, and validity, supporting accurate quantitative analysis and meaningful interpretation of results (**Ali et al., 2023; Hossain et al., 2024**).

2.4 Ethical Considerations

The research strictly adhered to ethical principles to safeguard participant rights and confidentiality. Participation was fully voluntary, and respondents were informed of their right to withdraw at any stage without consequence. No identifying information was collected, maintaining complete anonymity. All data were aggregated and used solely for academic purposes. Ethical approval was obtained from the relevant institutional review board, ensuring compliance with national and organizational standards for studies involving human

participants. The research team followed all procedural safeguards to uphold integrity and participant trust throughout the study.

3. Results

3.1 Demographic profile of respondents

Data were obtained from 350 professionals working across the United States in public, private, and nonprofit organizations. The sectoral composition was 35 percent public, 45 percent private, and 20 percent nonprofit, as summarized in Table 1. Role distribution reflected direct responsibility for AI driven MIS oversight and use, with managers comprising 40 percent of the sample, IT specialist's 35 percent, and decision makers 25 percent. The age structure was broad, with 25-34 years accounting for 38 percent, 35-44 years for 32 percent, 45-54 years for 20 percent, and 55 years and above 10 percent. Educational attainment was high and varied, with 50 percent holding bachelor's degrees, 38 percent master's degrees, and 12 percent doctorates or professional certifications. Geographically, 70 percent of respondents resided in urban locations, while 30 percent were in semi urban or rural settings. Experience with MIS was substantial; 60 percent reported 1-5 years, 25 percent reported 6-10 years, and 15 percent reported more than 10 years.

Table 1. Demographic Profile of Respondents

Demographic Variable	Category	Frequency	Percentage
Organization Type	Public	123	35%
	Private	158	45%
	Non-Profit	69	20%
Age Group	25-34	133	38%
	35-44	112	32%
	45-54	70	20%
	55+	35	10%
Education	Bachelor's	175	50%
	Master's	133	38%
	Doctorate/Professional Cert.	42	12%
Occupation	Manager	140	40%
	Information Technology (IT) Specialist	123	35%
	Decision-Maker	87	25%

This heterogeneity in sector, role, education, geography, and tenure supported a well contextualized assessment of AI MIS impacts on performance, equity, and sustainability as well as the obstacles encountered during implementation. The mix also improved external validity by reflecting the multi-layer composition of typical U.S. organizational ecosystems. Taken together, the sampling frame provided a credible basis for analyzing subgroup differences and for identifying readiness factors associated with successful adoption.

3.2 Organizational efficiency by sector and department

Adoption of AI driven MIS was associated with notable efficiency gains across the study population. Overall, 72 percent of respondents reported faster decision cycles, improved task completion, tighter coordination, and

more effective resource management. Sectoral comparisons indicated that efficiency improvements were most pronounced in the private sector at 75 percent, followed by non-profit organizations at 70 percent, and public organizations at 68 percent, as shown in Figure 1. Departmental analysis revealed consistent benefits in operations, information technology, administration and finance, and human resources. Respondents attributed these gains to automation of routine tasks, real time analytics, and error reduction, all of which shortened process times and stabilized throughput.

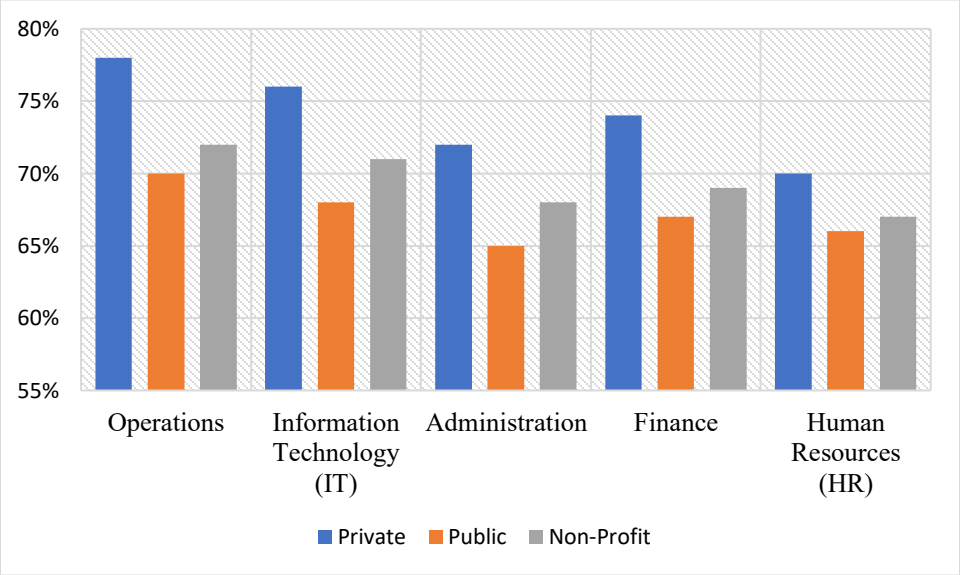

Figure 1: Organizational Efficiency by Sector and Department

Organizational scale and capability also mattered. Larger entities reported greater efficiency improvements, which respondents linked to stronger infrastructure, more mature data architecture, and better prepared workforces. Inferential results corroborated these patterns. Regression estimates indicated a statistically significant positive association between AI MIS use and efficiency outcomes ($\beta = 0.54$, $p = 0.001$). Correlation analysis found a strong positive relationship between AI MIS deployment and efficiency metrics ($r = 0.61$, $p = 0.01$). A Chi square test further showed that organizations classified as more ready for AI adoption had significantly higher odds of reporting efficiency improvements ($\chi^2 = 26.8$). These findings suggest that capability building in data engineering and change management amplifies the operational returns from AI MIS.

3.3 Social equity and economic sustainability

Survey responses indicated that AI MIS also supported more equitable organizational practices and stronger sustainability profiles. Sixty-four percent of participants perceived improvements in resource accessibility, decision transparency, and reduced disparities between units. Public and nonprofit organizations registered the highest rates of social equity gains at 67 percent and 66 percent, respectively, with private organizations at 62 percent, as displayed in Figure 2. Benefits were reported most often in operations, finance, and human resources, where standardized criteria, shared dashboards, and traceable workflows helped curb idiosyncratic gatekeeping and made allocation decisions easier to audit.

Figure 2: Social Equity and Economic Sustainability by Sector

Economic sustainability indicators improved in parallel. Sixty-five percent of respondents reported cost management gains consistent with leaner processes, improved scheduling, and smarter asset utilization. An average 7 percent cost reduction was reported across organizations, with 68 percent citing heightened productivity and more resilient resource management over time. Respondents emphasized the role of predictive analytics in anticipating demand and bottlenecks, which facilitated earlier interventions and reduced waste. Organizations with stronger strategic planning capacity and more advanced technological systems reported the largest cost and productivity effects. These results underscore the dual character of AI MIS as both a performance accelerator and a governance tool that can institutionalize fair access to information and resources.

3.4 Inferential statistics for AI MIS outcomes

Table 2. Inferential Statistics for AI-MIS Outcomes

Outcome	Regression (β)	Correlation (r)	p-value	χ^2
Organizational Efficiency	0.54	0.61	<0.001	26.8
Social Equity	0.48	0.57	<0.01	21.4
Economic Sustainability	0.51	0.59	<0.02	19.7
Implementation Challenges	-0.46	-0.53	<0.01	23.2

Inferential analyses substantiated the descriptive patterns for efficiency, equity, and sustainability, and clarified the role of readiness and barriers. For organizational efficiency, the regression coefficient was $\beta = 0.54$ with $p = 0.001$, and the correlation was $r = 0.61$ with $p = 0.01$, indicating a robust positive association. For social equity, estimates were $\beta = 0.48$ with $p = 0.01$ and $r = 0.57$ with $p = 0.01$, consistent with a moderate to strong positive

effect. For economic sustainability, the values were $\beta = 0.51$ and $r = 0.59$ with p less than 0.02, again indicating a positive relationship.

Organizational readiness exhibited statistically significant associations with all four consequence variables. Chi square tests showed readiness was linked to efficiency ($\chi^2 = 26.8$), social equity ($\chi^2 = 21.4$, $p = 0.001$), economic sustainability ($\chi^2 = 19.7$, $p = 0.01$), and implementation challenges ($\chi^2 = 23.2$, $p = 0.001$). In line with these associations, readiness negatively predicted the burden of challenges, with $\beta = -0.46$ and $r = -0.53$, indicating that better prepared organizations reported fewer obstacles. These patterns point to the centrality of preparatory investments in infrastructure, data governance, and workforce development.

3.5 Cross outcome synthesis of AI MIS impacts

Table 3. AI and MIS Impact Across Significant Outcomes

Outcome	Positive Response	Regression (β)	Correlation (r)	p-value	χ^2
Organizational Efficiency	72%	0.54	0.61	<0.03	26.8
Social Equity	64%	0.48	0.57	<0.01	21.4
Economic Sustainability	65%	0.51	0.59	<0.01	19.7
Implementation Challenges	54%	-0.46	-0.53	<0.01	23.2

Table 3 consolidates key outcomes by combining respondent reports with regression, correlation, and Chi square results. The strongest reported effect was on organizational efficiency, with 72 percent of respondents citing faster decisions, streamlined workflows, and improved resource stewardship. Social equity improvements were reported by 64 percent of respondents, with public and nonprofit sectors showing the largest shares of positive change. Economic sustainability outcomes were reported by 65 percent, anchored by a 7 percent average reduction in operating costs and broad descriptions of improved productivity and long horizon resource planning.

Challenges clustered in three categories. First, technical integration difficulties, including data interoperability and legacy system constraints. Second, workforce upskilling needs, particularly for roles that interface with model outputs and automated workflows. Third, exposure to cybersecurity threats, which increased with broader data access and expanded digital footprints. Organizations classified as more ready were more likely to mitigate these challenges successfully. The regression structure reflected this pattern, with positive coefficients for efficiency ($\beta = 0.54$), social equity ($\beta = 0.48$), and sustainability ($\beta = 0.51$), and a negative coefficient for challenges ($\beta = -0.46$). Correlations ranged from $r = 0.57$ to $r = 0.61$ for the beneficial outcomes and were negative for challenges, while Chi square values between 19.7 and 26.8 with p values at or below 0.03 affirmed statistical significance. Overall, the joint evidence indicates that AI driven MIS can simultaneously elevate operational performance, embed fairer access to information and resources, and strengthen economic stewardship when

supported by appropriate readiness measures. The results also imply that design choices and governance structures play a determinative role in translating technical capacity into equitable and sustainable practice.

4. Discussion

This study examined how AI driven MIS shape organizational efficiency, social equity, and economic sustainability while documenting the nature and prevalence of implementation challenges across 350 respondents from public, private, and nonprofit organizations in the United States. The integrated results show clear associations between AI MIS adoption and improved operational and governance outcomes, contingent on the level of organizational preparedness. These conclusions align with prior observations that organizations are turning to AI to supplement or replace conventional MIS that struggle with high velocity data and complex decision contexts (**Fabri et al., 2023**; **Pencle, 2022**).

Efficiency gains were the most salient, with 72 percent of respondents reporting faster decision cycles, fewer errors, and smoother coordination, and with the private sector registering the highest share of positive outcomes. These patterns are consistent with earlier accounts of AI enabled acceleration in decision support and process optimization, which point to automation, anomaly detection, and predictive insights as the principal mechanisms (**Garibay et al., 2023**; **Hoffmann, 2021**). The statistical results reinforce this interpretation, with a strong regression signal and correlation for efficiency ($\beta = 0.54$; $r = 0.61$), mirroring prior claims that AI can reduce human error, compress cycle times, and improve decision quality (**Dauvergne, 2020**; **Cowls et al., 2021**; **Helbing, 2018**). The readiness linkage captured by the Chi square test for efficiency suggests that structural change, staff training, and IT modernization are not peripheral but foundational to realizing gains at scale.

Social equity improvements were also prominent, particularly in public and nonprofit organizations, where transparent analytics and standardized criteria can be leveraged to limit discretionary inequities. Sixty four percent of respondents reported fairer resource access and greater decision transparency, with the inferential profile indicating a moderate to strong association for equity outcomes ($\beta = 0.48$; $r = 0.57$). These findings complement recent arguments that algorithmic auditing, open dashboards, and common data vocabularies can reduce disparities and strengthen accountability when embedded in governance protocols (**Rodgers et al., 2022**; **Sharma et al., 2020**; **Bednar & Welch, 2019**). Importantly, the positive equity signal did not negate the need for human oversight. Rather, it underscored that AI MIS should operate within policy frameworks that mandate transparency, contestability, and clear responsibility lines.

Economic sustainability outcomes were widely observed. Sixty-five percent of organizations reported benefits, including an average 7 percent cost reduction and broad productivity gains. The statistical pattern for sustainability was positive and significant ($\beta = 0.51$; $r = 0.59$), echoing prior work that connects granular telemetry, predictive resource planning, and scenario analysis with more efficient expenditure and long-term resilience (**Wirtz et al., 2018**; **Budhwar et al., 2022; Ifty et al., 2023**). Organizations that combined strategic planning with technological readiness and training reported the strongest sustainability improvements, aligning with arguments that competitive advantage arises from coupling data driven capabilities with human capital and process design (**Kumar et al., 2022; Rana et al., 2024**).

Implementation challenges were common, reported by 54 percent of respondents. The dominant categories were integration difficulties, workforce upskilling, and cybersecurity exposure. The negative association between readiness and challenges ($\beta = -0.46$; $r = -0.53$) indicates that preparatory investments can shift the balance from risk to reward. This resonates with recommendations to adopt phased rollouts, define clear model purpose and monitoring regimes, and institute continuous learning programs that build data literacy and human machine teaming skills (**Vinuesa et al., 2020; Happy et al., 2024; Rahman et al., 2024**). In practice, these measures entail aligning use cases to business goals, setting thresholds for model performance and drift, codifying feedback loops, and designing roles so that people remain responsible for consequential decisions while using AI as a decision support partner.

Three implications emerge for leaders and practitioners. First, AI driven MIS are not plug and play solutions. The efficiency and equity benefits observed here reflect the interaction between algorithms and organizational systems that must be engineered to work together. Second, equity and sustainability gains are achievable and measurable when governance, access policies, and auditing routines are integrated into the MIS layer. Third, readiness functions as the key moderator. Data architecture, cybersecurity posture, workforce capability, and change management collectively determine whether AI MIS amplifies value or magnify risk.

This evidence base supports a pragmatic adoption playbook. Begin with targeted use cases that map directly onto priority outcomes such as cycle time reduction, error mitigation, or fair allocation of scarce resources. Invest early in data quality, interoperability, and lineage so that outputs are trustworthy and auditable. Design training for both technical and non-technical staff that emphasizes interpretation, limits of models, and escalation rules. Finally, embed evaluation routines that track not only efficiency but also equity and sustainability indicators, ensuring that performance gains do not come at the expense of fairness or long-term resilience (**Bednar & Welch, 2019**).

5. Conclusion

This research provides evidence that Artificial Intelligence based Management Information Systems can deliver concurrent gains in organizational efficiency, social equity, and economic sustainability across public, private, and nonprofit institutions in the United States. The efficiency signal was strongest in private organizations, where data infrastructure and change management capacities tend to be more mature, enabling faster decision cycles, reduced process errors, and improved cross functional coordination. At the same time, the most substantial equity improvements appeared in public and nonprofit settings, where transparent analytics and standardized criteria supported fairer resource allocation and broadened participation in decision processes. Together, these patterns indicate that AI MIS can function as both a performance accelerator and a governance instrument that embeds consistency, traceability, and accountability in day-to-day operations. Economic sustainability gains were reflected in lower operating costs, better asset utilization, and more resilient planning anchored in predictive analytics. The combination of cost discipline and intelligent resource management suggests that AI MIS can strengthen long term viability by aligning financial decisions with granular operational

telemetry. These improvements were not uniform, however, and depended on the degree of organizational readiness observed at the time of implementation.

Readiness emerged as the pivotal moderating factor connecting AI MIS adoption to outcomes. Organizations that invested early in interoperable data architectures, robust integration pathways, and workforce upskilling reported fewer implementation obstacles and larger efficiency, equity, and sustainability benefits. Conversely, entities with fragmented legacy systems, limited data governance, and insufficient training encountered integration difficulties, cybersecurity exposure, and inconsistent use of model outputs. This contrast underscores that AI MIS value creation is contingent on socio technical alignment that coordinates technology, people, and processes. Three actionable implications follow. First, treat AI MIS adoption as a strategic transformation effort that couples technical deployment with explicit governance rules for transparency, auditability, and escalation. Second, sequence rollout through targeted use cases that are tightly linked to priority metrics such as cycle time reduction, equitable allocation, or cost containment, while establishing feedback loops for continuous improvement. Third, invest in capability building that equips both technical and non-technical staff to interpret outputs, manage risks, and sustain performance over time. AI MIS can reliably improve efficiency, fairness, and sustainability when supported by readiness, governance, and continuous evaluation. The findings position AI MIS not merely as a technological upgrade but as a management framework that, when implemented deliberately, converts data and algorithms into durable organizational advantage.

Funding

This work had no outside funding.

Author Contribution

The authors were involved in the creation of the study design, data analysis, and execution stages. Every writer gave their consent after seeing the final work.

Acknowledgments

We would like to thank the reviewers for their valuable suggestions.

A statement of conflicting interests

The authors declare that none of the work reported in this study could have been impacted by any known competing financial interests or personal relationships.

6. References

Addison, C. C., & Jenkins, B. W. C. (2023). Data analysis using SPSS: Jackson Heart Study. In *Springer eBooks* (pp. 363–379). https://doi.org/10.1007/978-3-031-41784-9_21

Alami, H., Rivard, L., Lehoux, P., Hoffman, S. J., Cadeddu, S. B. M., Savoldelli, M., Samri, M. A., Ahmed, M. A. A., Fleet, R., & Fortin, J. (2020). Artificial intelligence in health care: Laying the foundation for responsible,

sustainable, and inclusive innovation in low- and middle-income countries. *Globalization and Health, 16*(1). https://doi.org/10.1186/s12992-020-00584-1

Ali, K., Kausar, N., & Amir, M. (2023). Impact of pollution prevention strategies on environment sustainability: Role of environmental management accounting and environmental proactivity. *Environmental Science and Pollution Research, 30*(38), 88891–88904. https://doi.org/10.1007/s11356-023-28724-1

Bednar, P. M., & Welch, C. (2019). Socio-technical perspectives on smart working: Creating meaningful and sustainable systems. *Information Systems Frontiers, 22*(2), 281–298. https://doi.org/10.1007/s10796-019-09921-1

Budhwar, P., Chowdhury, S., Wood, G., Aguinis, H., Bamber, G. J., Beltran, J. R., Boselie, P., Cooke, F. L., Decker, S., DeNisi, A., Dey, P. K., Guest, D., Knoblich, A. J., Malik, A., Paauwe, J., Papagiannidis, S., Patel, C., Pereira, V., Ren, S., … Varma, A. (2023). Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT. *Human Resource Management Journal, 33*(3), 606–659. https://doi.org/10.1111/1748-8583.12524

Budhwar, P., Malik, A., De Silva, M. T. T., & Thevisuthan, P. (2022). Artificial intelligence: Challenges and opportunities for international HRM A review and research agenda. *The International Journal of Human Resource Management, 33*(6), 1065–1097. https://doi.org/10.1080/09585192.2022.2035161

Chen, M., Liu, Q., Huang, S., & Dang, C. (2020). Environmental cost control system of manufacturing enterprises using artificial intelligence based on value chain of circular economy. *Enterprise Information Systems, 16*(8–9). https://doi.org/10.1080/17517575.2020.1856422

Cowls, J., Tsamados, A., Taddeo, M., & Floridi, L. (2021). The AI gambit: Leveraging artificial intelligence to combat climate change Opportunities, challenges, and recommendations. *AI & Society, 38*(1), 283–307. https://doi.org/10.1007/s00146-021-01294-x

Dauvergne, P. (2020). Is artificial intelligence greening global supply chains? Exposing the political economy of environmental costs. *Review of International Political Economy, 29*(3), 696–718. https://doi.org/10.1080/09692290.2020.1814381

Elliott, K., Price, R., Shaw, P., Spiliotopoulos, T., Ng, M., Coopamootoo, K., & Van Moorsel, A. (2021). Towards an equitable digital society: Artificial intelligence (AI) and corporate digital responsibility (CDR). *Society, 58*(3), 179–188. https://doi.org/10.1007/s12115-021-00594-8

Fabri, L., Häckel, B., Oberländer, A. M., Rieg, M., & Stohr, A. (2023). Disentangling human–AI hybrids. *Business & Information Systems Engineering, 65*(6), 623–641. https://doi.org/10.1007/s12599-023-00810-1

Fatima, S., Desouza, K. C., & Dawson, G. S. (2020). National strategic artificial intelligence plans: A multi-dimensional analysis. *Economic Analysis and Policy, 67*, 178–194. https://doi.org/10.1016/j.eap.2020.07.008

Garibay, O. O., Winslow, B., Andolina, S., Antona, M., Bodenschatz, A., Coursaris, C., Falco, G., Fiore, S. M., Garibay, I., Grieman, K., Havens, J. C., Jirotka, M., Kacorri, H., Karwowski, W., Kider, J., Konstan, J.,

Koon, S., Lopez-Gonzalez, M., Maifeld-Carucci, I., … Xu, W. (2023). Six human-centered artificial intelligence grand challenges. *International Journal of Human-Computer Interaction, 39*(3), 391–437. https://doi.org/10.1080/10447318.2022.2153320

Goralski, M. A., & Tan, T. K. (2019). Artificial intelligence and sustainable development. *The International Journal of Management Education, 18*(1), 100330. https://doi.org/10.1016/j.ijme.2019.100330

Gupta, S., Modgil, S., Bhattacharyya, S., & Bose, I. (2021). Artificial intelligence for decision support systems in the field of operations research: Review and future scope of research. *Annals of Operations Research, 308*(1–2), 215–274. https://doi.org/10.1007/s10479-020-03856-6

Helbing, D. (2018). Societal, economic, ethical and legal challenges of the digital revolution: From big data to deep learning, artificial intelligence, and manipulative technologies. In *Springer eBooks* (pp. 47–72). https://doi.org/10.1007/978-3-319-90869-4_6

Hoffmann, S. (2021). Challenges and opportunities of area-based conservation in reaching biodiversity and sustainability goals. *Biodiversity and Conservation, 31*(2), 325–352. https://doi.org/10.1007/s10531-021-02340-2

Ifty, S. M. H., Hossain, B., Ashakin, M. R., Tusher, M. I., Shadhin, R. H., Hoque, J., ... & Sunny, A. R. (2023). Adoption of IoT in Agriculture-Systematic Review. *Applied Agriculture Sciences*, *1*(1), 1-10.

Kumar, S., Lim, W. M., Sivarajah, U., & Kaur, J. (2022). Artificial intelligence and blockchain integration in business: Trends from a bibliometric-content analysis. *Information Systems Frontiers*. https://doi.org/10.1007/s10796-022-10279-0

Mitra, A. K. (2023). A step-by-step guide to data analysis using SPSS: Iron Study data. In *Springer eBooks* (pp. 343–362). https://doi.org/10.1007/978-3-031-41784-9_20

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. T. (2022). Ethical principles for artificial intelligence in education. *Education and Information Technologies, 28*(4), 4221–4241. https://doi.org/10.1007/s10639-022-11316-w

Pencle, N. (2022). Motivating corporate sustainability research in management accounting through the lens of paradox theory. *Accounting Perspectives, 21*(4), 663–696. https://doi.org/10.1111/1911-3838.12314

Richey, R. G., Chowdhury, S., Davis-Sramek, B., Giannakis, M., & Dwivedi, Y. K. (2023). Artificial intelligence in logistics and supply chain management: A primer and roadmap for research. *Journal of Business Logistics, 44*(4), 532–549. https://doi.org/10.1111/jbl.12364

Rodgers, W., Murray, J. M., Stefanidis, A., Degbey, W. Y., & Tarba, S. Y. (2022). An artificial intelligence algorithmic approach to ethical decision-making in human resource management processes. *Human Resource Management Review, 33*(1), 100925. https://doi.org/10.1016/j.hrmr.2022.100925

Sharma, G. D., Yadav, A., & Chopra, R. (2020). Artificial intelligence and effective governance: A review, critique and research agenda. *Sustainable Futures, 2*, 100004. https://doi.org/10.1016/j.sftr.2019.100004

Truby, J. (2020). Governing artificial intelligence to benefit the UN Sustainable Development Goals. *Sustainable Development, 28*(4), 946–959. https://doi.org/10.1002/sd.2048

Tsolakis, N., Schumacher, R., Dora, M., & Kumar, M. (2022). Artificial intelligence and blockchain implementation in supply chains: A pathway to sustainability and data monetisation? *Annals of Operations Research, 327*(1), 157–210. https://doi.org/10.1007/s10479-022-04785-2

Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., Felländer, A., Langhans, S. D., Tegmark, M., & Nerini, F. F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. *Nature Communications, 11*(1). https://doi.org/10.1038/s41467-019-14108-y

Wirtz, B. W., Weyerer, J. C., & Geyer, C. (2018). Artificial intelligence and the public sector: Applications and challenges. *International Journal of Public Administration, 42*(7), 596–615. https://doi.org/10.1080/01900692.2018.1498103

Xiang, X., Li, Q., Khan, S., & Khalaf, O. I. (2020). Urban water resource management for sustainable environment planning using artificial intelligence techniques. *Environmental Impact Assessment Review, 86*, 106515. https://doi.org/10.1016/j.eiar.2020.106515

Zhao, J., & Fariñas, B. G. (2022). Artificial intelligence and sustainable decisions. *European Business Organization Law Review, 24*(1), 1–39. https://doi.org/10.1007/s40804-022-00262-2

Rana, M. N. U., & Bhuyian, M. T. (2024). Elevated Resilient Agrostructures (ERA): A Climate-Smart Solution for Nutrition and Livelihood Security in Flood-Prone Rural Landscapes. *Research Sustainability*, *1*(01), 01-15.

Rahman, M. H., Islam, T., Hossen, M. E., Chowdhury, M. E., Hayat, R., Shovon, M. S. S., ... & Sunny, A. R. (2024). Machine Learning in Healthcare: From Diagnostics to Personalized Medicine and Predictive Analytics. *Integrative Biomedical Research*, *8*(12), 1-8.

Hossain, B., Sunny, A. R., Gazi, M. M. R. N., Das, A. R., Mohajon, R., Miah, T. H., & Rana, M. N. U. (2024). Advancing fish farming through deep learning: Applications, opportunities, challenges, and future directions. Pathfinder of Research, 2(3), 58–80.

Happy, A. T., Hossain, M. I., Islam, R., Shohel, M. S. H., Jasem, M. M. H., Faysal, S. A., ... & Sunny, A. R. (2024). Enhancing Pharmacological Access and Health Outcomes in Rural Communities through Renewable Energy Integration: Implications for chronic inflammatory Disease Management. *Integrative Biomedical Research*, *8*(12), 1-12.