TPM Vol. 32, No. S8, 2025
ISSN: 1972-6325
https://www.tpmap.org/

Open Access

THE INFLUENCE OF ARTIFICIAL INTELLIGENCE (AI) INTEGRATION ON LEADERSHIP DECISION QUALITY THROUGH CAPABILITIES AMIDST POTENTIAL RISKS: A MODERATED MEDIATION STUDY

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Abstract
In the context of Saudi Arabia's Vision 2030, this paper seeks to investigate the effects of artificial intelligence (AI) adoption on leadership decision quality in Saudi public and private organizations, including higher education institutions. Grounding in socio-technical systems theory and digital leadership theory, it investigates the mediating effect of leadership capability and the moderating effect of perceived risk. The sample comprised 526 organizational leaders and the data were analyzed through structural equation modelling (SEM) in combination with Hayes's PROCESS macro (Model 7).
AI integration is found to have positive, significant effects on leadership decision quality, directly and indirectly, through enhanced leadership capabilities; however, perceived risks—ethical, operational and technological—moderate this relationship and mitigate the direct effects of AI on decision quality. A difference by sector type is evident, with public organizations (74%) having higher AI implementation rates than those in the private sector, which have greater agility and innovative potential. This study's theoretical contribution lies in its enrichment of theory by synthesizing sociotechnical and digital leadership perspectives in the emergent model of AI-enabled leadership. More practically, it suggests that ethical, human-centered and capability-focused AI policies may enhance leadership decision quality and assist in advancing Saudi Arabia's Vision 2030 digital transformation.
Keywords: Artificial Intelligence, leadership, decision quality, Saudi Vision 2030

1 INTRODUCTION

1.1 Background of the Study

Artificial intelligence (AI) is transforming organizational data management, decision-making and international relationships, proving a game changer for organizations across the globe. In higher education institutions, AI takes on several roles: it streamlines management practices, accelerates research processes and promotes data-informed decision-making. AI applications for analytics are being employed to support analysis and planning, strategy management, and student performance enhancement in universities worldwide (Bevilacqua et al., 2025). This transformation is consistent with Saudi Arabia's Vision 2030, which emphasizes innovation and digital maturity across the public sector. Higher education administrators increasingly count on AI-driven intelligence, predictive analytics and cognitive systems to drive institutional strategies (Khan et al., 2025). However, while this redefinition of leadership from administrative control to information-savvy orchestration enhances outcomes, it also raises a host of ethical, technical and psychological considerations that may make some leaders hesitate to trust AI in life-or-death decision-making.

1.2 Problem Statement

AI offers great potential to improve decision quality; however, challenges remain. Risks faced by leaders include algorithmic bias, privacy breaches, lack of transparency and loss of human autonomy (Chandrika, 2024). These concerns can erode trust and prevent AI uptake. On the other hand, effective integration promotes digital literacy, analytic thought and strategic vision (Bevilacqua et al., 2025). Consequently, the gains from AI depend on not just technology but also leaders' skill to use AI and their risk perceptions in doing so.
Few studies have examined how AI adoption affects leadership capacity and perceived risk, especially in relation to decision quality in Saudi higher education. This paper attempts to begin to close this gap by developing a

moderated mediation model that connects AI integration, increased capabilities, perceived risk and decision quality.

1.3 Research Aim and Objectives

The purpose of this research is to investigate the impact of AI integration on leadership decision quality in Saudi organizations by studying the mediating effect of leadership capacity and perceived risk. Thus, the specific objectives are as follows:

1. Evaluate the extent of AI incorporation among Saudi organization leaders.
2. Examine the impact of AI integration in improving leaders' capabilities.
3. Investigate the relationship between enhanced capabilities and decision quality.
4. Explore the trade-off between increased capacities and decision-making quality.
5. Analyze how perceived risk moderates the relationship between enhanced capabilities and decision quality.
6. Propose practical recommendations to promote effective AI-driven leadership practice in Saudi organizations.

1.4 Research Questions

To achieve these objectives, the research is guided by the following research questions:

1. How does AI integration influence leadership capabilities in Saudi organizations?
2. To what extent do enhanced capabilities improve decision quality?
3. What role do perceived risks play in moderating the relationship between AI-driven capabilities and decision quality?
4. How can AI be effectively leveraged to enhance decision-making without compromising the ethical and human dimensions of leadership?

1.5 Significance of the Study

The study adds to theoretical and practical knowledge of AI-enabled leadership in a higher education context. From a theoretical point of view, it advances the understanding of socio-technical systems theory by revealing how technology and human dimensions converge to influence leadership outcomes. Moreover, it extends digital leadership theory by emphasizing how AI nurtures the cognitive and strategic tools of leaders.

From a practical perspective, the findings provide implications for Saudi organizations' policy makers and administrators who are looking to responsibly implement AI. It emphasizes the need to develop digital literacy skills for leaders, while managing similar risks for AI ethics, transparency and accountability. The insights can be used for training programs, policy-making and organizational AI governance practices compatible with Vision 2030.

1.6 Theoretical and Practical Contributions

By drawing upon socio-technical systems theory and digital leadership theory in the context of Saudi Arabia's digital transformation, this research contributes to the theoretical understanding of AI and leadership decision-making. The results demonstrate that effective digital transformation depends on an equilibrium between technological subsystems, including AI tools, data analytics and automation, and human subsystems, which include the leaders' digital competence, ethics and adaptability. This synergy highlights the point that technology alone cannot contribute to improving decision quality unless it is in good hands, namely competent and ethically informed leadership.

Empirically, the research contributes to STST by demonstrating that AI's influence on decision quality is maximized when human and technological subsystems co-evolve, reinforcing the thesis that digital innovation requires an adaptive organizational culture. With the integration of digital leadership theory, it conceptualizes leadership capability as a dynamic provocation that turns AI integration into strategic sense-making and ethical decision-making. Second, the moderating role of perceived risk adds a behavior dimension by focusing on the psychological and ethical considerations affecting leaders' intention to trust AI technology-powered systems.

In terms of practical implications, the findings of this study are meaningful for organizational leaders, policymakers and educators committed to the Vision 2030 transformation agenda. These findings indicate that AI adoption is positively related to the quality of leadership decisions, based on improvements in analytic capability, strategic foresight and institutional agility. But this augmentation is, of course, subject to the willingness of our leaders to understand, trust and regulate AI using an ethical approach.

2 LITERATURE REVIEW

2.1 Theoretical Foundations

The intersection of AI and leadership in higher education must be grounded in a theoretical base. Two dominant frameworks – socio-technical systems theory (STST) and digital leadership theory (DLT) – offer a holistic construct to explain technology interaction with human leadership as the impetus for decision-making and transformation in organizations. Combined, these theories describe how AI is acting as not just a technology but as a shaping force within the human–organizational environment, namely in higher educational leadership in light of Vision 2030.

2.1.1 Socio-Technical Systems Theory

Originally developed by Trist (1981), STST focuses on the complementary work of social and technical subsystems in achieving organizational effectiveness. The premise is that effective performance occurs when there is a good fit between human behavior, the company's culture and values, and technological systems. In the context

of leadership effectiveness in AI integration, the leadership capability to manage this alignment in leveling human intuition and ethical reasoning might include analogical thinking, trust-index relationships and the analytical precision provided by AI (Bevilacqua et al., 2025).

In Saudi organizations, AI is increasingly seen as a 'technology subsystem' that helps leaders make decisions based on data (data-driven decision-making), predict what is going to happen, and strategically plan for it. Such instruments can help policymakers make better-informed decisions when assessing scenarios, assign resources and design institutional reforms (Khan et al., 2025). Yet STST also cautions that technology on its own does not assure better results; success relies on the social system's capacity to accommodate new digital processes. For example, the readiness of educational leaders to be guided by and act upon those insights developed in teaching practice through AL is influenced by the cultural conditioning within their institutions, ethical standards and policy contexts (Zárate-Torres et al., 2025). Vision 2030 and the digital transformation mandate that STST advocates the application of "joint optimization", that is, combining AI technology with human leadership to improve input for decision-making in Saudi organizations.

Whereas STST addresses the interplay between technology and organizational design, digital leadership theory (DLT) examines how the role of leadership is changing in an information society. DLT contends that today's dynamic and informed leaders need to have digital intelligence, technological agility and the ability to integrate AI tools to ensure their strategic advantage (Bevilacqua et al., 2025). It is an evolution on the traditional approach to leadership as it factors in cognitive and analysis augmentation on technology.

In higher education, digital leadership implies the ability to leverage AI for strategic anticipation, policy design and institutional innovation (Gupta et al., 2024). Leaders are no longer merely administrators; they have transformed into "digital orchestrators" who oversee intricate data ecosystems and overlay technological insights on to decision-making. This transition is largely in tune with Vision 2030, which focuses on innovation, knowledge economy and digital governance to leverage national competitiveness.

DLT reveals that digital transformation is not only technical, but also profoundly cultural and ethical. Leaders must chart a path among the data privacy, algorithmic fairness and transparency obstacles that are affecting the academic landscapes of Saudi Arabia (Chandrika, 2024). Good digital leaders do this by striking a balance between what is technically possible and ethically responsible, infusing AI deployment with increased institutional legitimacy and citizen trust.

STST and DLT comprise a complementary framework for the research: STST interprets AI interaction with leadership at the system level and DLT explains the cognitive behavior changes of leaders in the digital age. These foundations rationalize the adoption of AI integration, augmented capabilities, perceived-risk taking and decision quality as co-dependent constructs that influence leadership effectiveness within Saudi's higher education context.

2.1.2 Digital Leadership Theory

Table 1. Theoretical Foundations and Conceptual Relationships

Construct	Theoretical Basis	Key Concepts / Dimensions	Expected Relationship	Supporting Sources
AI Integration	Socio-Technical Systems Theory (Trist, 1981)	The use of AI tools in decision-making; automation a nd data-driven governance	Improves the efficiency of leadership and operations	Khan et al. (2025); Kober (2025)
Enhanced Capabilities	Theory of Digital Leadership (Bevilacqua et al., 2025)	Also known as thinking ab out the future; critical thinking,	Mediating role of AI integration in the relationship between AI integration and decision quality	Bevilacqua et al. (2025); Gupta et al. (2024)
Perceived Risks	Socio-Technical Systems Theory/Ethical AI Perspective	Fears of bias, opacity, privacy and human oversight	Moderates the AIidecision quality relationship (In a high-risk environment, the effects are diluted)	Chandrika (2024); Zárate-Torres et al. (2025)
Decision Quality	Theory and Practice of Digital Leadership & Organizational Decision	Accuracy, efficiency, comprehensiveness of decisions	An outcome variable representi ng the performance of leadership enabled by AI	Gupta et al. (2024) Madancian (2024)

Note: This table presents the theoretical couplings of the conceptual framework, demonstrating how AI integration, by means of enhanced capabilities and with perceived risks as a moderation effect, will contribute to better decision-making**.**

2.2 AI Integration

The integration of AI reveals the determination of leaders to incorporate and integrate AI tools across their organizational processes, governance systems and strategic decision-making. In higher education, this

encompasses more than automation to encompass smart systems (i.e., systems that use statistics and deep learning to forecast behaviors, generate insights, and support evidence-based decision-making) (Khan et al., 2025). This convergence involves more than a shift in technology, however, as it shapes the way that organizations operate and the influence of organization leadership on society.

Consistent with Vision 2030, the implementation of AI in the higher education sector encourages digital transformation, human capital development and a knowledge-based economy (Ministry of Education, 2024). By using AI-powered analytics, universities can enhance student retention, faculty assessment, resource distribution and research performance. Accordingly, AI is identified as a major driver of strategic agility allowing leaders to deftly meet changing educational demand (Kober, 2025).

The effectiveness of AI adoption is dependent on the organizational culture and leadership preparedness. Leaders who understand and have faith in AI are more likely to integrate it into the governance framework (Khairullah et al., 2025). However, realizing it requires a culture that stimulates technological discovery, promotes open data sharing and fosters cross-border collaboration. When AI supports rather than replaces human judgment, it can lead to more accurate, efficient decisions in institutions (Bevilacqua et al., 2025).

In the Kingdom's universities, it can be found applied to all aspects of their operations—from predictive enrolment models and faculty performance analytics to natural language processing tools for academic assessment and policy simulations for fiscal management. Yet this integration is hampered by ethical ethics, gaps in data governance, a lack of infrastructure and inadequate training programs that need to be aligned with institutional missions.

In socio-technical systems terminology, AI is a technological subsystem that integrates with human leadership to increase institutional performance (Trist, 1981). The healthy equilibrium of human and machine intelligence is essential for stimulating creativity and driving strategic success.

To summarize, AI adoption underlies the concepts addressed in this research—ambitious leadership skills, perceived risks, and level of decision quality—and emphasizes the significance of AI in transforming Saudi Arabian higher education leadership within Vision 2030.

2.3 Enhanced Capabilities

AI shows great potential in augmenting leaders' strategic sense, analytical rigor, communication and decision support. These innovations are in contrast with the previous intuition-driven leadership regime, leading to data-centric decision-making (Bevilacqua et al., 2025). With AI-powered analytics, predictive modeling and visualization tools, leaders can get ahead of the curve by anticipating trends in their institutions, assessing various policy scenarios and formulating data-driven strategies.

Enhanced capabilities are, however, less generously supported in the context of the national agendas around digital literacy, innovation and organizational learning that fall outside of the Vision 2030 agenda. AI leverages the cognitive abilities of leaders by converting large-scale organizational data into intelligence (Gupta et al., 2024). This enables university management to determine effective resource utilization, adapt academic programs according to labor market requirements and to follow-up performance against national quality benchmarks (Al-Harthi & Rahman, 2024).

These competencies seem to represent a shift in the cognitive and behavioral attributes, when leaders are able to integrate algorithmic insights with human judgment in ways characterized as transparent, collaborative and continuous learning (Bevilacqua et al., 2025). Saudi organizations, including universities, drive this change with leadership development programs for deans and vice-presidents, teaching them to read AI dashboards, use predictive analytics and make ethical decisions based on data.

The empirical evidence suggests that decision quality under black-swan conditions would also be enhanced, as AI augments leaders' assessments of risks, strategies and comparisons and transparently justifies decisions (Gupta et al., 2024; Madancian, 2024). Through the concepts of effectiveness and efficiency, these capabilities lead to accountability, while the other competencies lead to governance quality in accordance with Vision 2030 based on transparency and institutional excellence.

However, this potential will not be fully realized without the extensive support of organizations, the digital literacy to use it and ethical trust in AI systems. The misunderstanding of AI output due to poor training is a frequent cause of underutilization and misinterpretation (Chandrika, 2024). Thus, continued investments in leadership and management, infrastructure and ethical policy frameworks will be required to fully realize the promise of AI.

In summary, enhanced capabilities act as a key construct in linking AI adoption to increased leadership performance. When combined with socio-technical alignment and digital maturity, these capabilities enable Saudi higher education leaders to achieve excellence through data, thereby contributing positively toward national reform goals.

2.4 Perceived Risks

Although the benefits and strategies related to AI in higher education leadership are superior, its implementation is frequently limited by evident risks, mainly leaders' cognitive and affective appraisals of harm are a liability of AI-related use. Such risks commonly involve issues of data privacy, bias in algorithms, transparency absence, human autonomy loss and humans' dependence on machine decisions (Chandrika, 2024). Although AI holds the potential for efficiency and accuracy, its deployment involves challenging the ethical and social implications that impact leaders' acceptance and dependence on technology in governance.

From a sociotechnical systems perspective (Trist, 1981), perceived risk is the form that social control takes in the technological subsystem. The trustworthiness and threat of AI are not absolute and depend on the organizational

culture, policy frameworks, or digital transformation history of the institutions. For example, Zárate-Torres et al. (2025) point out that risk perceptions are often rooted in the uncertainty about how AI algorithms impact decision logic, which can be considered opaque or "black-boxed." Opaque scenarios like these can erode confidence in conclusions and drive leaders to put more stock in traditional judgment and less faith in AI-generated recommendations.

Pair this with conservative cultural and regulatory sentiments about academic freedom, and these logics are amplified within the Saudi higher education system. Organizations invested in Vision 2030 must quickly digitalize, but decision-makers are grappling with complex ethical questions about data ownership, surveillance and algorithmic accountability. The deployment of AI-based student evaluations or faculty assessments, for example, has implications for fairness and objectivity (Al-Kahtani & Aziz, 2024). Additionally, the sensitive nature of academic data and the lack of localized ethical guidelines increase fears surrounding misuse or misinterpretation.

Studies show that perceived vulnerabilities are not uniformly negative; they can inspire critical consciousness and ethical reflection, leading to a more responsible AI governance (Chandrika, 2024). Nevertheless, an overcritical attitude can be detrimental to the development of innovation and the deployment process, with innovations facing tension between compliance and competitiveness (Zárate-Torres et al., 2025). Indeed, leaders who overestimate risks may elect not to deploy systems for AI-based analysis, consequently constraining their ability to enhance decision quality and the performance of the organization (Bevilacqua et al., 2025).

In this paper, perceived risk is considered as a moderator—i.e., something that moderates the relationship between increased capabilities and decision quality. Leaders who believe that the risks are high will be less inclined to turn their technical proficiency into action, while those who perceive risk levels as low will feel more comfortable acting on the advice of AI. This buffering effect is consistent with empirical insights on trust, transparency and moral clarity as necessary antecedents to effective human-AI collaboration (Gupta et al., 2024; Zárate-Torres et al., 2025).

Ultimately, at the heart of mitigating perceived risks is not reducing uncertainty but developing ethical resilience— building capacity among leaders to think critically about AI and ensure a human in the loop. This reflects Vision 2030's more general aim to achieve innovative but also ethically inured digital transformation, whereby technological progress is seen as augmenting rather than repeating human agency with respect to institutional leadership.

2.5 Decision Quality

In the Saudi context, a measure of the decision quality is an important barometer for governance performance as well as organizational resilience. In the AI leadership model, decision quality portrays a dependent variable that is affected by a level of AI implementation and extent of enhanced capabilities such as enhanced competition—both moderated by a leader's risk perception.

Leaders armed with the train/tune process fed to them through an AMV box can take in mountains of data streams. Hereby, they can simulate outcomes of policy decisions and optimize how resources are distributed, all through the deployment of predictive modelling. This lowers the uncertainty and thereby increases the objectivity and accuracy of the decision (Gupta et al., 2024). In the Saudi higher education arena, where leaders are responsible for institutional performance according to Vision 2030, AI-informed decisions may facilitate more precise predictions with regard to enrolment trends, academic program currency and financial custodianship (Al-Harthi & Rahman, 2024).

Following socio-technical systems theory, good decision-making quality occurs when the technology subsystem (knowledge of AI tools) and social subsystem (leadership and culture) are in harmony. Technology provides data-driven perspectives, and human judgement adds contextual meaning and ethical scrutiny (Trist, 1981). This synergy enriches the value of strategic and operational decisions—especially in today's complex environments, wherein Saudi organizations are moving toward digital.

Moreover, the adoption of AI technology can assist in evidence-based leadership that will eliminate hunch-driven decisions and instead favor fact-based management. The relevance lies in the superordinate possibilities that belong to the superior use of AI tools, such as evaluating multiple decision alternatives, supporting the mitigation of cognitive biases or enhancing cross-departmental-communication (Bevilacqua et al., 2025). The quality of the decision therefore refers not only to the technical relevance of its results, but also to the ability for everyone to be included in and benefit from such access (Madancian, 2024).

An improved capacity move comprises increased skills—such as analytical thinking, digital literacy and strategic foresight—that mediate the connection between AI inclusion and decision quality. Leaders who nurture these skills are more capable of interpreting AI outcomes and using them effectively (Gupta et al., 2024). On the other hand, high perceived risks such as bias concerns, ethical issues and data security may reduce trust in AI systems and thus decrease the relationship between capabilities and decision quality (Chandrika, 2024; Zárate-Torres et al., 2025).

Decision quality is a national imperative amid Vision 2030 wherein organizations, especially universities, are to operate as AI-powered institutions for governance transparency and competitive academe. Quality decision-making can thus be both a performance metric and a strategic goal for this new style of leadership—part of the larger evolution in how IT leaders are embracing strategically focused, technology-powered leadership over administrative management.

In short, quality decision-making in AI-enhanced environments results from the successful interaction of technical systems with human capabilities and ethical governance. It is a reflection of leadership effectiveness in the 21st century, and particularly within the rapidly changing emerging environment for higher education in Saudi Arabia.

2.6 AI and the Transformation of Leadership in Decision Quality

The very nature and substance of leadership in higher education has been fundamentally altered by AI. Historically, decision-making by leaders was more intuitive, informed and consultative, but AI-informed environments appear to be preoccupied with a data-led and evidence-based approach to governance. This change is especially notable in the Saudi higher education context as Vision 2030 has identified digital transformation as an obligatory strategy for reaching an institution's and a nation's aspirations of excellence (Ministry of Education, 2024).

AI applications are redefining leadership roles by improving the precision, promptness and responsibility of institutional decision-making. Such tools provide a deep understanding of student learning, financial management and faculty productivity (Khan et al., 2025). Today leaders make use of AI systems for predictive planning, scenario simulation and risk analysis. They can thus expand their analytical abilities with these systems and become proactive rather than reactive. In this way, AI is a cognitive multiplier for leaders that enhances their capacity to think through complex issues and engage in strategic planning over the long term (Gupta et al., 2024).

Theoretically this transformation represents the intersection between STST and DLT. STST contends that the effectiveness of leadership in the information era is determined by how well technological tools fit human and organizational subsystems (Trist, 1981). DLT goes on to say that technology also augments leaders' strategic mind-sets by facilitating their ability to process, encourage and communicate transparent decisions (Bevilacqua et al., 2025). In combination, these views demonstrate that AI changes leadership not only in terms of faster execution but also by increasing the quality and richness of decision-making.

But this change doesn't come without challenges. As AI permeates the fabric of governance, leaders will be faced with an emerging ethical, technical and relational complexity. Left to their own devices, high-performing AI systems can unconsciously reinforce algorithmic bias and/or erode human accountability (Chandrika, 2024). Therefore, transformational leadership implies the promotion of digital ethics, interpretive literacy and a culture of responsible innovation (Zárate-Torres et al., 2025). Those leaders who act ethically with AI management gain more than decision accuracy; they garner institutional trust—a necessary asset in Saudi Arabia's dynamic education environment.

Empirical findings reinforce this notion. Greater leadership skills—arising from increased quality of data, analytics and vision—are on the path between AI integration and better decisions (Gupta et al., 2024). However, this positive relationship can be attenuated by high perceived risks such as data insecurity or the loss of human control (Zárate-Torres et al., 2025). Hence, AI's disruptive impact on leadership is contingent: when leaders trust and are able to understand the functioning of AI, it augments decision quality; when risks are felt as elevated, its adoption benefits are lessened.

AI-driven leadership transformation can serve as the cornerstone for Vision 2030 to ensure that, across universities, governance becomes accountable and based on data. Leaders who successfully embed AI into strategic planning can improve institutional agility, encourage innovation and maintain academic excellence. Finally, this change is a paradigm shift from hierarchical and subconscious leadership into cloud tech enhanced collaborative leadership based on scientific data and ethical considerations.

2.7 Previous Studies

Recent studies have emphasized that AI is shaping leadership in education and organization management; however, the influence is intricate and subjective. The empirical literature reveals a gap between the promise of AI in enhancing decision quality and the underlying barriers, which are related to ethical concerns, digital readiness and human–machine collaboration. This section offers a critical review of previous research, drawing attention to global and Saudi evidence as well as identifying the deficiencies in the literature that make this study necessary.

2.7.1 Global Perspectives

Internationally, the use of AI in leadership sites has been linked to increased analytical accuracy and data-led strategic making. For example, Gupta et al. (2024) revealed the added value of data-driven approaches in leaders' strategic foresight in that ecosystem challenges could be anticipated and resources effectively allocated. Similarly, Bevilacqua et al. (2025) established that digital leadership acts as the mediator between technological innovation and organization learning, therefore concentrating on human capability building to achieve maximum productivity of AI.

Yet studies by Chandrika (2024) and Madancian (2024) show ethical and epistemic frictions in AI decision-making. Leaders sometimes encounter what Zittrain calls "algorithmic uncertainty," a kind of feeling that comes when automated suggestions come into conflict with intuition or moral judgment. These concerns underscore the need to balance machine intelligence with human judgment in order for it to be fair, transparent and accountable. Thus AI does not just generate better decisions on its own, it makes better-informed value-based decisions.

2.7.2 Middle Eastern and Saudi Contexts

Studies outside of Western contexts point to different – sometimes opposing – influences on, e.g., the use of Islamic banking products than those that appear relevant in Western cases. In the Middle East, especially Saudi Arabia, research has demonstrated rapid digital transformation based on a similar example of Vision 2030,

aspiring to foster a knowledge-based economy and an innovation-driven nation. Al-Kahtani and Aziz (2024) found that Saudi university heads are increasingly aware of AI as an accelerator for institutional modernization while being hesitant in the face of the moral ambiguity and lack of digital governance structures. Al-Harthi and Rahman (2024) similarly found Saudi education leaders acknowledging the potential of AI for enhancing resource allocation and academic performance, but also expressing concerns about data privacy and implementation readiness.

In their study of twelve Saudi universities, Khan et al. (2025) observed the effect of implementing AI on decision efficiency and administrative transparency, with a mediation role of leadership digital competences. This is consistent with Bevilacqua et al. (2025), who propose that a transformation of leadership depends on the development of analytically, ethically and collaboratively based competences. Meanwhile, Zárate-Torres et al. (2025) identify that perceived risks – specifically concerning data misuse – impact the relationship between AI use and decision outcomes, establishing trust in AI systems as a significant enabler of its implementation.

2.7.3 Gaps in the Literature

Nevertheless, despite such studies, there are still various gaps in the research findings. First, there is little empirical research on AI's mediational effects – in the sense that it operates through an increase in available processing capacity – in the relationship between AI incorporation and decision quality. Most of the previous studies have mainly addressed single mediation paths, instead of testing a moderated mediation model that represents the complex interrelations among technology, leadership and risk perception.

Second, the local context implies that AI adoption is mostly presented as a technological innovation (rather than managerial reformation). The cultural, moral and institutional contexts of AI acceptance are rarely scrutinized in a systematic way. In addition, few of the studies in this topic area involve senior academic leaders (e.g., presidents, vice presidents and deans), who are important to understanding governance level decision-making.

Finally, we have scant empirical data on the impact of AI on decision quality and higher education. The bulk of these are about efficiency or automation and don't actually address how AI affects the depth, inclusivity and (for want of a better word) ethics of leadership decisions. In light of the above, this research addresses these gaps by examining a moderated mediation process through which AI adoption facilitates decision quality via enhanced capabilities, with perceived risks as a moderator for Saudi organizations' leaders.

Table 2. Recent Research Findings on AI and Leadership

Author(s)	Year	Context / Sample	Focus of Study	Key Findings
Gupta, Malik, and Verma	2024	Global higher education institutions	AI and strategic foresight in leadership	Artificial intelligence enhances the ability to foresee and plan wit h data.
Chandrika	2024	Business and educational management	Ethical risks in AI decision-making	Highlight tension between automation and human moral reasoning.
Bevilacqua, Conti, and Marra	2025	European universities	Digital leadership and organizational learning	The relationship between AI adoption and innovation is moderated by leadership capabilities.
Madancian	2024	International education management	AI's effect on decision-making efficiency	The ethics to be considered are th e timeliness and dependability of AI.
Khan, Rahman, and Al-Sharif	2025	Saudi universities	AI integration in academic governance	Positive impact on transparency; moderated by leaders' digital proficiency.
Al-Kahtani and Aziz	2024	Saudi public university	Moral implications of AI in academia	Lack of stringent ethics guideline s hindering adoption of AI.
Al-Harthi and Rahman	2024	Saudi university	Digital academic leadership development	AI is a booster of leadership quality but encounters readiness hurdles.
Zárate-Torres, Martínez, and Alcaraz	2025	Organizational leadership (LatAm)	AI trust and transparency	The effects of AI on decision outcomes are qualified by perceived risks.

Note: The results of all studies reviewed are evidence of AI's positive contributions to decision quality (i.e., analytics and strategy) in leadership, but this relationship is moderated by the perception risks (against or for) and ethical sensitivity. Saudi's case demonstrates both power and reticence in the move for AI leverage as a form of governance under Vision 2030.

TPM Vol. 32, No. S8, 2025
ISSN: 1972-6325
https://www.tpmap.org/

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3 THEORETICAL AND CONCEPTUAL FRAMEWORK

Based on the literature review, we herein propose a conceptual model relating AI integration to enhanced capabilities, perceived risks and quality of decision, as facilitated by a moderating mediation model. The framework is anchored by STST and DLT, synthesizing the impact of technology and human leadership on how decisions will be reached in AI-based settings.

STST (Trist, 1981) theorizes that organizational effectiveness emerges when the technological and social subsystems are congruent. AI integration in this study is the technological subsystem (software application that generates algorithmic insights and recommendations) that supplies leaders with AI-driven analysis, intuition-enhancing tools and automations; augmented capabilities represent the cognitive-strategic-communicative/human subsystem of leaders' intelligences for using AI. At a contextual level of analysis, the outcome is the identification of the perception of risks (transparency, ethical bias and data security) as shaping the boundary condition through which these subsystems impact decision quality; this latter measure becomes an ultimate outcome for leadership.

DLT (Bevilacqua et al., 2025) also indicates that leaders who appropriately use technology strengthen their capacity to foresee, analyze and make decisions with empirical evidence. In the Vision 2030 setting, this interaction embodies a strategic objective of all higher education to transform governance through digital enablement and the responsible adoption of AI.

Figure 1. Conceptual Model

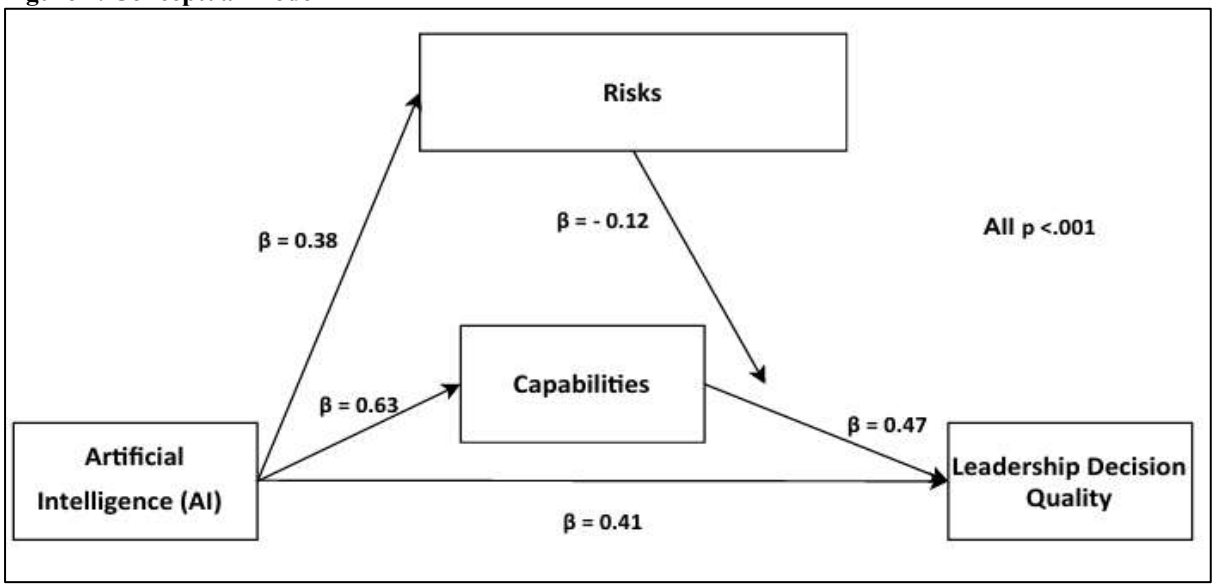

Figure 1 shows the proposed model, whereby enhanced capabilities mediate the effect of AI integration on decision quality and perceived risks moderate this indirect linkage, so that it is suppressed when there are higher perceptions of risk (Figure 1).

3.1 Hypotheses Development

3.1.1 AI Integration and Leadership Outcomes

AI implementation is the degree to which leaders adopt AI tool(s) in their strategy and operations (Khan et al., 2025). Previous research indicates that AI is expected to improve decision timeliness, transparency and accountability through real-time business intelligence (Gupta et al., 2024). In higher education, AI underpins evidence-based leadership in following the agendas of higher education institutions (Bevilacqua et al., 2025). Therefore:

H1: Decision quality is significantly predicted by AI integration for leaders.

3.1.2 AI Integration and Enhanced Capabilities

Leaders who interact with AI learn high-level analysis and strategic skills. AI enables better prediction, problem-solving and data interpretation (Gupta et al., 2024). Leaders develop confidence and advance communication in decision-making through ongoing interactions with digital tools (Bevilacqua et al., 2025). Thus:

H2: AI integration is positively related to leaders' enhanced capabilities.

3.1.3 AI Integration and Perceived Risks

However, along with these advantages comes the uncertainty surrounding data ethics and bias, as well as loss of human oversight. For example, studies like those of Chandrika (2024) and Zárate-Torres et al. (2025) have demonstrated that such perceived risks affect the extent to which leaders are willing to trust in AI. Hence:

H3: Perceived risks of bias, transparency and autonomy are positively correlated with AI integration.

3.1.4 Increased Capability, Perceived Risk and Decision Quality

Leaders have better capacities to interpret the results from AI and convert them into strategic decisions and thereby make higher-quality decisions (Madancian, 2024). But when perceived risks are high, trust in AI systems decreases, which mitigates the positive impact of increased capabilities on decision outcomes (Zárate-Torres et al., 2025). Therefore:

H4: Enhanced capabilities mediate the indirect relationship between AI integration and decision quality, and this indirect effect is moderated by perceived risks, such that the association weakens with high-risk perceptions and strengthens under low-risk perceptions.

4 METHODOLOGY

4.1 Philosophy

This research utilizes a quantitative cross-sectional approach, underpinned by positivist ways of knowing, objectivity, measurement and statistical generalization (Cohen et al., 2011). The design is consistent with the research's objective in determining the relationships between AI integration, enhanced capabilities, perceived risks and decision quality in Saudi organizations.

4.2 Population and Sampling

The target population consisted of those occupying the senior leadership positions at public and private organizations, including universities in Saudi Arabia, such as university presidents, vice-presidents, deans, vice-deans and heads of departments. Representation from a variety of institutional types and leadership positions was achieved through stratified sampling. The convenience sampling technique was used due to the practical challenges in detecting the population. The target population was not easily reachable or well-documented, making it hard to construct a comprehensive sampling frame. Convenience sampling allowed the researchers to gather data efficiently from participants who volunteered. This technique ensured timely data collection while still providing valuable insights relevant to the study goals.

A total of 526 valid survey responses were used after cleaning and screening (accepted responses rate = 97.7%). The sample was predominantly in line with the nationalization objectives of Vision 2030 and was dominated by Saudis (77.4%) (PhD degree holders were 80.2% of respondents).

4.3 Instrumentation

The questionnaire was designed to collect data using adaptations of validated scales. The scale items were developed by modifying existing validated items from already conducted studies on AI and leadership to ensure content validity and reliability as shown below:

- **AI Integration:** Items were adapted from studies on AI adoption, such as Khan et al. (2025), to measure the extent to which leaders incorporate AI tools into their decision-making processes.
- **Enhanced Capabilities:** Scales were adapted from research on AI's impact on leadership, like Bevilacqua et al. (2025), to assess perceived improvements in strategic foresight, communication, and evidence-based reasoning.
- **Perceived Risks:** Items were based on literature examining the ethical challenges of AI, such as Chandrika (2024), to capture leaders' concerns regarding algorithmic bias, transparency, data security, and the erosion of human autonomy.
- **Decision Quality:** The scale was adapted from research on AI's role in leadership decision-making, including Gupta et al. (2024), to evaluate the perceived accuracy, efficiency, and comprehensiveness of strategic decisions.

All constructs were measured on a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Content validity for the adapted instrument was confirmed through an expert panel review with academics from different universities; a subsequent pilot test with 16 leaders confirmed the clarity and reliability of the items.

4.4 Ethical Considerations

Participants read an informed consent form and then responded to the questionnaire. All responses were anonymous, kept confidential and used for academic purposes only. The institutional research ethics committee granted ethical approval. Confidentiality, transparency and voluntary participation in the study were maintained according to international research ethics principles.

5 FINDINGS

5.1 Data Analysis Procedures

The data were analyzed using the SPSS and PROCESS Macro (Model 7) to test the hypothesized moderated mediation model. This method enabled the testing of all direct, indirect and conditional effects of the hypothesized models simultaneously. The analysis followed two systematic steps to guarantee the trustworthiness of findings.

5.1.1 Factor Analysis

The KMO measure = 0.94 and Bartlett's Test of Sphericity (χ^2 = 3124.87, p 0.70; AVE > 0.50) indicated convergent validity. Discriminant validity was established with the help of the Fornell–Larcker criterion.

5.1.2 Descriptive Statistics

Mean results indicated overall positive attitudes: Integration of AI (M = 4.11, SD = 0.68). Enhanced Capabilities (M = 4.08, SD = 0.65). Quality of the Decision (M = 4.16, SD =0.62). Perceived Risk (M = 2.73, SD = 0.81). These findings hint at high AI engagement and faith in AI-supported leadership, dampened by moderate risk sensitivity.

A total of 526 valid responses were analyzed. Most respondents were male (67.3%), Saudi nationals (77%), aged 40-49 (49%), and held doctoral degrees (80%). Leadership roles were broadly distributed across presidents and

vice presidents (1.1%), deans, vice deans and directors (14.8%), and supervisors and committee members (13.7%), along with heads of department and deputy heads (46%). The sample comprised both public (72.1%) and private (27.9%) organizations, including the educational sector, ensuring coverage across institutional types.

Table 4. Demographic Profile of the Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	354	67.3
	Female	172	32.7
Age Group	20–39 years	94	17.9
	40–49 years	258	49.0
	50 years and above	174	33.1
Leadership Role	President, Vice President, Consultant	6	1.1
	Dean, Vice Dean, Managing Director,	78	14.8
	Supervisor, Committee President	72	13.7
	Department Head, Chairman, Deputy Head	245	46.6
	Others	125	23.7
Leadership Experience	Less than 5 years	26	4.9
	5–10 years	111	21.1
	10 or more years	389	74.0
Nationality	Saudi	407	77.4
	Non- Saudi	119	22.6
Academic Qualification	PhD	422	80.2
	Master's	78	14.8
	Bachelor's	26	4.9
Institution Type	Public sector	379	72.1
	Private sector	147	27.9

Note: Most respondents were male Saudi leaders over 40 years of age, with PhD degrees and working in the public sector

5.1.3 Correlation Analysis

All correlations remained significant ($p < 0.01$). Enhanced Capabilities showed strong positive relationships with AI Integration ($r = 0.68$) and Decision Quality ($r = 0.36$). In contrast, Perceived Risks was negatively correlated with Decision Quality ($r = -0.42$). Table 5 shows the Pearson correlation matrix between the constructs.

Table 5. Correlations Between the Research Variables

Constructs	AI Integration	Enhanced Capabilities	Perceived Risks	Decision Quality
AI Integration	-			
Enhanced Capabilities	0.68**	-		
Perceived Risks	0.41**	0.36**	-	
Decision Quality	0.36**	0.64**	- 0.42**	-

Note: N = 526. All correlations are statistically significant and in the expected direction.

5.2 Measurement Model

All constructs met psychometric standards. Cronbach's alpha = 0.88–0.94, CR > 0.80, and AVE > 0.50, supporting internal consistency and convergent validity; HTMT values indicated discriminant validity. These results confirm a sound measurement model for AI Integration, Enhanced Capabilities, Perceived Risks and Decision Quality.

Table 6. Reliability and Validity Results

Construct	No. of Items	Cronbach's α	CR	AVE
AI Integration	6	0.91	0.92	0.86

Enhanced Capabilities	7	0.94	0.93	0.71
Perceived Risks	6	0.88	0.89	0.64
Decision Quality	5	0.90	0.91	0.69

Note. Reliability and validity indices exceed the suggested levels (Hair et al., 2022).

The measurement model evaluation was firstly conducted. The reliability of the constructs was examined using Cronbach's alpha; a composite reliability (CR) of more than 0.70 and an AVE greater than 0.50 indicate internal consistency and convergent validity. The AVSEQ was then further tested using AMOS, and all standardized loadings were greater than 0.70 ($p < 0.001$), and the goodness of fit indices (CFI = 0.96, TLI = 0.95, RMSEA = 0.051, SRMR = 0.043) demonstrated a good measurement model.

5.2.1 Structural Model

By using structural equation modeling (SEM) via AMOS and PROCESS Macro of Hayes (Model 7, with 5,000 bootstrap resamples), a reasonable fit of the model was confirmed ($\chi^2/df = 2.41$, CFI = 0.96, TLI = 0.95, RMSEA = 0.051). The study examined direct, indirect and moderated mediation effects in accordance with the conceptual model. We used Hayes' PROCESS Macro (Model 7) to test the significance of both mediation and moderation paths, using 5000 bootstrap resamples, and because of this sampling method robust estimates do not rely on normality assumptions. The path result is reported in the next section.

5.2.2 Regression and Hypothesis Testing

To avoid mass significance in multiple testing, we followed the initial examination of our proposed relationships using Hayes' PROCESS Macro (Model 7, keeping bootstrap set at 5000 resamples and confidence set to 0.95), which enabled us to test and compare potential mediating and moderating effects simultaneously. The model tested whether Enhanced Capabilities mediated the relationship between AI Integration and Decision Quality, and if Perceived Risks moderated this indirect effect.

The results showed that AI Integration is significantly associated with Enhanced Capabilities ($\beta = 0.63$, $p < 0.001$), indicating that leaders who work (interact) with AI tools have stronger analytical and strategic abilities. In connection, AI Integration also has a direct link with Decision Quality ($\beta = 0.41$, $p < 0.001$), supporting H1.

All of the talent dimensions are strong positive predictors of Perceived Decision Quality ($\beta = 0.47$, $p < 0.001$), which confirms the mediating role postulated by H4. The indirect effect of AI Integration on Decision Quality through Enhanced Capabilities is also significant ($\beta = 0.30$, $p < 0.001$), confirming partial mediation. This finding implies that, although the use of AI directly increases decision quality, a significant part of this increase is due to a capability effect.

Perceived Risks also play a significant intermediary role in the moderated mediation path. The interaction of Perceived Risks and Enhanced Capabilities was negative and significant ($\beta = -0.12$, $p = 0.003$) with an apparent attenuation in the beneficial effects of Enhanced Capabilities on Decision Quality as Perceived Risks increase.

The conditional indirect effects demonstrate that the indirect effect of AI Integration on Decision Quality via Enhanced Capabilities is more significant ($\beta = 0.35$, $p < 0.001$), though it is less pronounced in the context of high risk perceptions ($\beta = 0.18$, $p = 0.011$). The Index of Moderated Mediation (−0.12, 95% CI [−0.19, −0.05]) demonstrate statistical validity for moderation performed in the model test.

The model as a whole accounts for 62% variance in Decision Quality ($R^2 = 0.62$, $F(4,521) = 142.8$, $p < 0.001$), indicating that the variation in leadership decision performance in AI-enabled contexts is well-explained by this model.

Taken together, these results support:

- H1: The impact of AI integration on decision quality (direct effect).
- H2: Enhanced capabilities are reinforced by AI integration.
- H3: AI integration raises perceived risks.
- H4: Capabilities mediate the indirect relationship between AI integration and decision quality, and this indirect effect is moderated by perceived risks such that the association weakens with high-risk perceptions and strengthens under low-risk perceptions.

This "middle space" model underscores AI's dual effect on leadership – an enhancer of capabilities and a risk-averse technology for which higher education leaders require sophisticated strategic and ethical management.

Table 6. Results of Regression and Moderated Mediation (PROCESS Model 7)

Path	Effect Type	β	SE	t	p	Result
AI Integration → Decision Quality	Total Direct Effect	0.41	0.07	5.85	<0.001	Supported (H1)
AI Integration → Enhanced Capabilities	Direct Effect	0.63	0.05	12.60	<0.001	Supported (H2)
AI Integration → Perceived Risks	Direct Effect	0.38	0.06	6.33	<0.001	Supported (H3)
Enhanced Capabilities → Decision Quality	Direct Effect	0.47	0.05	9.40	<0.001	Supported (H4)
Perceived Risks × Enhanced Capabilities → Decision Quality	Interaction (Moderation)	−0.12	0.04	−3.00	<0.003	Supported (H4 moderation)

AI Integration → Enhanced Capabilities → Decision Quality	Indirect Effect (Mediation)	0.30	0.05	6.00	<0.001	Supported (Partial Mediation)
Conditional Indirect Effect (Low Risks)	Moderated Mediation	0.35	0.06	5.83	<0.001	Stronger Effect (Supported)
Conditional Indirect Effect (High Risks)	Moderated Mediation	0.18	0.07	2.57	<0.011	Weaker Effect (Supported)

Model Summary $R^2 = 0.62$, $F(4, 521) = 142.8$, $p < 0.001$. Index of Moderated Mediation = −0.12, 95% CI [−0.19, −0.05].

Note: There is also a partial mediation of the relationship between AI Integration and Decision Quality by Enhanced Capabilities in PROCESS Macro (Model 7). Perceived Risks uniquely moderates the mediation to a significant degree, which means that at low Perceived Risks, Mediation is higher and, in turn, Decision Quality also increases.

5.3 Sectorial Differences in AI Adoption (Public vs Private)

A specific cross-institution comparison of the private and public sectors in Saudi Arabia also reveals that Saudi public sector organizations are more inclined to adopt AI than their private sector counterparts. Only 27% of leaders in the private sector say that their AI use is limited or extensive. The length of time to approve new technology implementation in private institutions amounts to about six years, whereas it is three or less for public institutions. This difference is part of the overall trend toward greater dynamism and innovation in the public sector and resonates well with the goals of Vision 2030 for increasing digitalization. The stated 74% is sector-specific and refers to the demographic sample distribution ratio between public, 72.1, and private, 27.9.

In a summary of the evidence, the results show that incorporating AI technologies has direct and indirect impacts on organizations' decision quality by enhancing their capabilities; meanwhile, the risks perceived by organizations weakens association between capabilities and decision-making. The model has a good fit, as confirmed by the substantial explained variance, and the AI use-gap between the private and public institutions positions a two-speed transition for Saudi organizations that demands targeted capacity building and governance for inclusion progress.

6 DISCUSSION

This paper contributes empirical evidence with a robust empirical research design demonstrating that incorporating AI adds to the quality of leadership decision-making, both directly and indirectly, by fostering higher-qualified capabilities; perceived risks—ethical, operational and technological—serve to weaken this positive relationship. These findings are consistent with the hypothesized moderated-mediation model and test the dual theoretical bases in STST (Trist, 1981) and DLT (Bevilacqua et al., 2025) as appropriate lenses through which to explore how technology adoption dovetails with human capability and ethical cognition in AI-enabled decision-making.

Through the STST perspective, these results confirm that leadership decision quality peaks when a technological system (AI tools, analytics, automation) is developed along with the social system (leadership skillset, culture, ethics). The robust relationship between AI adoption and organizational performance ($\beta = 0.001$) suggests that AI serves as a technological enabler, enhancing leaders' analytic anticipation and strategic responsiveness. These correlate with our results and those of Khan et al. (2025), who find that AI implementation in Saudi universities increases transparency and governance when moderated by leaders' digital literacy, and with Kober (2025), who show how AI-based data governance leads to higher institutional responsiveness and accountability.

STST also suggests that technical systems are incapable of delivering high performance if not accompanied by social adaptation. Bevilacqua et al. (2025) also describe how the potentialities of AI are realized only when human subjects ethically interpret algorithmic outputs. The current results verify this principle: the capability of leadership is the human gateway that translates technical capability to decision quality. It follows that AI supports rather than substitutes for human judgment, illustrating the notion of balancing articulated by Trist (1981).

The mediating role of increased capabilities lends support to DLT's claim that technology fluency, futuring ability and ethical reasoning are requisites for effective leadership in this era. Echoing Gupta et al. (2024) — who find that AI-based foresight provides academic leaders with the ability to anticipate environmental change — AI tools are shown in this study to train higher-level analytic skills that are critical for decision quality ($\beta = 0.001$). These outcomes are also consistent with Madancian (2024), who concludes that AI improves the timeliness and credibility of educational decisions, and Al-Harthi and Rahman's (2024) findings that AI-based capacity building projects enhance Saudi leaders' decision-making metacognitive abilities.

The mediation of this direct effect by induced suppression also remains significant ($\beta = 0.30$, $p < .001$) and emphasizes that the contribution of AI to decision quality depends to a great extent on human competence. This result supports the findings of Bevilacqua et al. (2025), because competent leadership makes DTUM an organizational learning, thus extending DLT further than AI simply as a physical amplifier to get to the point where AI is conceptualized as being accompanied by cognitive amplifiers across multiple channels, thereby demythologizing pure digital reductionism and enabling leaders' power of making sense out of data, i.e.,

transforming data into insights and then changing these insights in ethical actions. In a concrete sense, this illustrates that leadership capacity mediates between technology potential and governance capability.

While we find a positive impact of AI integration on decision quality, this relationship diminishes under high perceived risk (β = −0.12, p =. 003). Leaders who expect data breaches, algorithmic bias or failures to maintain human control make poor choices about how to translate technical expertise into good decisions that can be acted on. This result is consistent with the ethical-risk analysis frameworks developed by Chandrika (2024) and Zárate-Torres et al. (2025), who both stress that trusting in transparency and moral clarity is how AI is effective in an organization.

Risk perception acts as social factor in the socio-technical system, and thus its influence on technology and leadership is moderated. Leaders who display moral efficacy and technical trust — constructs identified by Gupta et al. (2024) — can use AI to achieve better accuracy and efficiency; on the other hand, greater risk perceptions impede experimentation and learning. In cosmopolitan Saudi Arabia, with its strict regulations and cultural conservatism, this moderation is especially noticeable. Al-Kahtani and Aziz (2024) argue that the lack of ethical guidelines fosters uncertainty, whereas Zárate-Torres et al. (2025) show that perceived risk negatively affects trust and performance. Hence, reducing perceived risk by adopting clear policies and explainable AI systems is essential for optimal leadership outcomes.

The segmentation analysis showed that the public sector has a higher level of integration in AI (= 74%) in comparison with the private sector (= 28%), but this latter presents greater agility and flexibility. This split reflects national dynamics: institutions of the state are organized in line with formalized Vision 2030 governance, and corporates along market-shaping logics. Our results are also in agreement with the studies by Al-Harthi and Rahman (2024) and Khan et al. (2025), who describe greater digital readiness in public universities but greater capacity for innovation in private companies.

Saudi's digital transformation journey, therefore, has both a two-speed nature and directionality – public sector structural progression on one road versus private-sector nimble progress. In the context of Vision 2030, attaining alignment through common ethical values, cross-sector training and collective governance becomes key to enabling sustainable level of digital maturity.

6.1 The Study's Theoretical Integration and Contribution

This study connects STST and DLT into the moderated-mediation model that provides a unified theoretical explanation for AI-enabled leadership. From STST, the balance of human and technology subsystems provide optimal solutions. Mediating the AI–decision-quality chain is digital intelligence, where DLT and AI tools align with purpose at both the ethical and strategic levels. Along this path, perceived risk, conditioned under ethical-behavioral theory, presents psychological and moral side-effects. Collectively, these insights construct AI-supported leadership as a dynamic equilibrium between digital competence and ethical governance. The outputs agree with Gupta et al. (2024) and Bevilacqua et al. (2025), who present digital leadership as being technical, but also humanistic, and support the ideas of Chandrika (2024) and Zárate-Torres et al. (2025), who underscore the value of moral reasoning and transparency. As such, this study integrates the fields of technological innovation and ethical leadership in Vision 2030.

6.2 The Practical and Policy Implications of the Study

The implications of this research for national policy and leadership practice, especially in light of Saudi Arabia's Vision 2030, with its focus on digitalization, innovation and sustainable governance, can be seen as far reaching. By showing that it is enhanced by AI adoption, yet moderated by risk perceptions, this study uncovers key avenues to support leadership's effectiveness in the age of smart technologies.

Consistent with the Vision 2030 goal to shape future-ready leaders, organizations should pay paramount attention to a complete digital leadership development that would incorporate technological, analytical and ethical skills. Based on the findings of Al-Harthi and Rahman (2024), leadership development programs need to focus their efforts on developing AI literacy, data-driven reasoning and strategic foresight. Beyond "quantifiable technical skills," leaders should develop emotional intelligence, ethics awareness and adaptive governance capabilities as they navigate AI-augmented environments. The formation of national digital leadership academies – a distinctive component of Vision 2030's human capital strategy – could institutionalize these capabilities and foster a sustainable leadership pipeline.

The use of AI must be driven by ethical integrity and transparency, as per Vision 2030's governance pillar. Institutions are encouraged to form AI ethics committees and decision-audit frameworks, as proposed by Al-Kahtani and Aziz (2024), in order to govern the algorithmic decision-making practice and ensure fairness and accountability. Compliance with SDAIA regulations is as important as trust and legitimacy. Explainable AI (XAI) and privacy-preserving data policies will help to address perceived risks and the confidence of leaders in AI-driven governance systems, promoting an environment for ethical innovation.

Vision 2030, on the other hand, calls for incorporating technology while ensuring that human judgment is not undermined. Given this, organizations could adopt a "human-in-the-loop" mode of the decision-making process (Madancian, 2024), one in which AI serves to enhance humans instead of replacing them. This hybrid approach allows ethical non-linearity, contextual understanding and strategic discretion to be still attributed to leaders while incorporating automated functions. Integrating moral reasoning in AI governance prevents bias and corresponds with Vision 2030's vision of human-centric digital transformation, thereby increasing institutional responsiveness and public confidence.

As part of Vision 2030's mission to facilitate public, private and academic cooperation, companies should build cross-sector innovation clusters that exchange AI know-how and insights in ethics. As highlighted by Khan et al. (2025), it is not uncommon for public institutions to be ahead on digital readiness, while private organizations are agile and experimental. Combining these complementary strengths, through collaboration, joint research projects and collective leadership development programs, has the potential to expedite the national AI transformation agenda. Partnership governance models will make sure that the digital world supports more than economic performance: it also should reflect social responsibility.

At the policy level, the following are some of the recommendations:

The Ministry of Education and the SDAI should develop certifications for AI leadership based on Vision 2030's governance ambitions.

AI-powered decision-support systems need to be integrated within government organizations' administrative operations for increased transparency, speed and quality of services.

National funding could prioritize AI ethics and leadership research to support responsible innovation and adaptive policy development.

Decision-makers should develop inclusive AI leadership programs, aiming for gender balance and the inclusion of young people in digital capacity-building processes.

These are the implications that ultimately help preserve the vision of a digitally uplifting, moral Saudi Arabia. By educating digitally savvy and ethically responsible leaders, AI integration can be a driver for institutional excellence and societal advancement. Through instilling ethical governance, transparent AI frameworks and collaborative innovation ecosystems, Saudi leadership can turn Vision 2030's digital aspirations into actionable results that walk the fine line between technological progression and human values.

The results further reveal that AI integration benefits leadership decision quality through enhanced digital and cognitive capabilities, whereby this effect becomes contingent on the extent to which leaders feel morally comfortable and scared vis-à-vis risk. With AI integrated into clear human-focused governance frameworks, it becomes a tool for empowerment – not replacement. These results achieve the balance of the man and machines hoped for by both STST and DLT, aligning Saudi leaders for a responsible digital transformation as per Vision 2030.

7 CONCLUSION

This research contributes to the literature on AI-facilitated leadership decision-making by testing a moderated mediation model grounded in STST and DLT. The results suggest that AI assimilation substantially enhances leadership decision quality, both directly and indirectly through heightened leadership capabilities, while perceived risks moderate this salubrious relationship. These findings also have theoretical implications, showing that the effectiveness of leadership in AI-enhanced contexts is a function of digital competences and value assurance and adaptiveness.

In the light of Saudi Arabia's Vision 2030, these observations highlight the importance of human-oriented digital transformation as a critical success. Vision 2030 aims to promote a knowledge-based economy that is indicative of innovation, superior governance and sustainable development. This study highlights that these aspirations can only be achieved if AI technologies are embedded within transparent, ethical and inclusive governance processes. AI should not be seen by leaders as a technological innovation in isolation, but rather as a strategic engine that boosts analytical judgment, ethical intelligence and institutional evolution. Accordingly, and if Vision 2030's long-term aspirations of prosperity in society and excellence within organizations are to be realized, the need to grow digitally literate, ethically responsible leaders becomes imperative.

7.1 Limitations and Future Research

Despite its valuable theoretical and practical implications, the study has some limitations.

First, it was implemented in a cross-sectional design, which limits the possibility of drawing causal conclusion on AI integration, leadership competences and quality of decision-making. Longitudinal and experimental designs in future studies would be better able to capture the temporal changes and causal order of these associations.

Second, the sample was limited to firms in Saudi Arabia. While this setting-based approach generates insights consistent with the Vision 2030 agenda, it also has implications for the generalization of study results in other contexts as well as specific institutions. Another direction of future research is cross-national and international comparisons between or within the countries in the Gulf Cooperation Council (GCC), which would add robustness to the model.

Third, in this study, AI integration was considered as a unidimensional concept. Nevertheless, different AI technologies — including predictive analytics, machine learning or generative AI — may have separate effects on decision-making and ethical risk perception. Moving forward, researchers may examine these technological sub-dimensions more closely to isolate their specific impact on leadership effectiveness.

A more comprehensive model, as presented in this study, can be developed further in future studies. Longitudinal and mixed methods approaches may illustrate the stages at which organizations learn how to lead with capability over time as they deepen their integration of AI systems (Nerantzi et al., 2016). Such studies would help to inform a more nuanced understanding of how digital and ethical skills manifest in practice.

Additionally, by taking a look at differences in sectors – meta comparisons of organizations within public, private or educational domains, for instance – it could be interesting to reveal the underlying patterns in transforming leader behavior and institutional outcomes when facing AI integration. As Saudi Arabia continues to work on the digitalization of government, education and the industry through Vision 2030, such comparative studies might provide valuable input for policy coherence and successful implementation.

In addition, ethical AI frameworks and organizational culture may be examined as moderators in the relationship between AI and leadership. Exploring trust, transparency and psychosocial safety as determinants of AI adoption would enrich the socio-technical basis in leadership research more generally, and enable evidence-based policy interventions that support responsible digital transformation.

Finally, the study delivers empirical results and theoretical insights on the possibility of AI integration to improve leadership decision quality coherence with Vision 2030's digital transformation plan. These findings also demonstrate that through the software compliance with human values, ethics and strategy, there is a strong national ground for innovation and institutional excellence as well. Adopting this balanced, people-focused approach will ensure that digital transformation under Vision 2030 brings about the ultimate aim: a thriving, just and knowledge-based society.

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