Leadership Commitment and Effective AI Initiative Implementation in Saudi Healthcare Administration: The Mediating Role of Change Management

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Abstract: *Effective AI initiative implementation in healthcare administration requires more than the technical deployment of digital tools; it depends on sustained leadership commitment, structured change capability, and institutional alignment. This paper examines the leadership pathway through which leadership commitment contributes to effective AI initiative implementation in Saudi healthcare administration, with change management tested as the mediating mechanism. The study used a quantitative survey design based on 267 usable responses from healthcare administrators in the Tabuk Health Cluster. The analysis followed the reported PLS-SEM procedure, including descriptive statistics, reliability assessment, measurement-model evaluation, structural path analysis, and mediation testing. The verified results show that leadership commitment had a significant direct effect on effective AI initiative implementation (beta = 0.199, t = 2.072, p = 0.003) and a stronger direct effect on change management (beta = 0.559, t = 5.715, p = 0.000). Change management had the strongest effect on effective AI initiative implementation (beta = 0.945, t = 13.457, p = 0.000), while the indirect effect of leadership commitment through change management was also significant (beta = 0.528, t = 5.372, p = 0.000). These findings indicate partial mediation and show that leadership commitment improves AI implementation both directly and by strengthening structured change management. Theoretically, the results position change management as the operational mechanism that translates strategic leadership support into AI implementation effectiveness. Practically, Saudi healthcare organizations should combine visible leadership sponsorship with disciplined transition systems that prepare staff, align resources, manage resistance, and institutionalize AI-enabled administrative practices.*

Keywords: Leadership commitment; change management; effective AI implementation; Saudi healthcare administration; digital transformation; PLS-SEM.

1. Introduction

Artificial intelligence has become increasingly important in healthcare administration because it can support decision-making, improve operational coordination, strengthen monitoring systems, and enhance the efficiency of service delivery. Recent healthcare AI literature confirms that AI applications are increasingly linked to clinical support, administrative efficiency, workflow improvement, and health-service quality, although successful adoption depends on more than technical development alone (Sharma et al., 2022). In Saudi Arabia, AI adoption is also connected to the national modernization of healthcare services and to broader digital transformation priorities under Vision 2030. Recent Saudi-focused evidence further indicates that AI is being positioned as part of healthcare quality improvement, service efficiency, diagnostic support, and operational modernization within the Saudi healthcare system (Alghareeb & Aljehani, 2025). However, the implementation of AI in healthcare administration is not simply a technical matter. It requires organizational readiness, managerial coordination, governance awareness, staff engagement, and a clear understanding of how AI-enabled processes will be embedded into daily administrative work. These requirements make AI implementation a multidimensional organizational challenge rather than a narrow technology installation exercise.

Leadership commitment is central to this transformation because healthcare AI initiatives require strategic direction, resource mobilization, ethical attention, and continuous administrative support. Recent evidence on AI transformation in healthcare organizations shows that leadership is required across strategic, operational, technological, and organizational domains to guide responsible and sustainable AI integration (Sriharan et al., 2024). Leaders who clarify the purpose of AI, communicate expectations, and allocate resources can reduce uncertainty and increase confidence among employees who may be concerned about workflow disruption, professional roles, patient safety, and data responsibility. Ethical and responsible AI implementation also requires governance attention because healthcare AI may raise concerns related to accountability, trust, transparency, fairness, and safe use in sensitive service environments (Siala & Wang, 2022). At the same time, leadership commitment alone may not be sufficient if it is not converted into structured change management. AI initiatives require planned communication, training, resistance management, stakeholder involvement, implementation monitoring, and alignment between strategic objectives and operational routines (Harrison et al., 2021). Healthcare leaders have identified strategic change-management capacity, professional transformation, and AI-specific implementation strategies as central challenges in moving AI from potential value to routine organizational practice (Petersson et al., 2022).

The research gap addressed in this paper concerns the mechanism through which leadership commitment contributes to effective AI initiative implementation in Saudi healthcare administration. Although leadership is often identified as a key driver of digital transformation, less attention is given to how leadership commitment becomes implementation effectiveness through organized change processes. Recent implementation-science work on AI in healthcare also emphasizes the need for structured implementation frameworks that guide preparation, planning, stakeholder engagement, adaptation, and evaluation across the implementation process (Nilsen et al., 2023). This paper therefore focuses on the leadership pathway within the broader empirical model and examines change management as the mediating mechanism between leadership commitment and effective AI initiative implementation. The focused contribution is important because it clarifies that strategic leadership support has both a direct implementation role and an indirect role through the development of structured transformation capacity.

1.1 Literature Review and Hypotheses Development

1.2 Effective AI Initiative Implementation in Healthcare Administration

Effective AI initiative implementation refers to the successful integration of AI tools into healthcare administrative processes in a way that improves workflow, decision-making, monitoring, resource optimization, and service outcomes. Evidence shows that AI affects medical and administrative processes, including efficiency, service quality, and operational decision support (Ali et al., 2023). Responsible implementation requires attention to governance, accountability, and operational fit because AI systems operate within sensitive healthcare environments where administrative decisions may influence clinical coordination and patient-related processes (Reddy et al., 2020). Therefore, AI implementation cannot be evaluated only by whether a technology is acquired or launched. It must also be evaluated by the extent to which the technology becomes usable, accepted, monitored, and aligned with institutional objectives. Healthcare AI implementation is frequently described as an implementation challenge because it depends on adoption, staff engagement, workflow integration, management support, and institutional learning (Shaw et al., 2019). Recent reviews show that implementation barriers include ethical, technological, liability, regulatory, workforce, social, and patient-safety challenges (Ahmed et al., 2023). Saudi-focused literature indicates that AI adoption remains shaped by readiness, infrastructure, governance, and implementation challenges (Bayer & Eisawi, 2025). This context increases the importance of leadership-driven coordination and structured execution, because healthcare administrators occupy the operational space where strategy, resources, processes, and employee readiness must be aligned.

1.3 Leadership Commitment as a Strategic Implementation Driver

Leadership commitment refers to the extent to which organizational leaders demonstrate sustained support for strategic objectives, allocate resources, communicate direction, and remain actively engaged in implementation. In digital healthcare transformation, such commitment is essential because AI initiatives require strategic vision, operational follow-through, and leaders who can connect technology adoption with organizational priorities (Kludacz-Alessandri et al., 2025). Committed leaders can strengthen implementation capacity by ensuring that financial, technical, and human resources are available, by aligning AI projects with institutional priorities, and by reinforcing the ethical and practical boundaries within which AI is used. Without this level of commitment, AI initiatives may remain fragmented experiments rather than integrated administrative capabilities. The theoretical logic of this paper is that leadership commitment creates the organizational conditions required for effective AI implementation. Leaders shape priorities, legitimize transformation efforts, and influence how employees interpret the value and risk of AI-enabled change. Evidence on AI deployment indicates that leadership is important for guiding interdisciplinary implementation and translating AI innovation into healthcare outcomes (Li et al., 2025). Accordingly, the paper expects leadership commitment to be positively related to effective AI initiative implementation in Saudi healthcare administration.

1.4 Change Management as a Mediating Mechanism

Change management provides the approach through which strategic support is translated into implementation activities. In digital transformation, organizations must move from existing routines toward new systems through transition processes (Bellantuono et al., 2021). In healthcare, change management matters because technological adoption affects roles, workflows, accountability systems, and performance expectations. Recent evidence identifies stakeholder engagement, implementation leadership, local adaptation, and reflective evaluation as conditions for integrating machine-learning applications (Preti et al., 2024). Effective change management helps organizations introduce new practices while addressing staff concerns, training needs, resistance, and monitoring requirements. These activities are relevant for AI because successful adoption depends on acceptance, workflow fit, trust, and operational integration (Wolff et al., 2021). Leadership commitment is expected to strengthen change management because committed leaders can authorize resources, communicate priorities, remove barriers, and sustain attention during implementation. Digital health readiness also shows that leaders need capacity, training, support, and motivation for workplace change during implementation (Steenkamp et al., 2025). Change management then converts leadership commitment into execution routines by organizing training, communication, stakeholder involvement, resistance management, and continuous improvement. Therefore, change management is positioned in this paper as the operational bridge between leadership support and effective AI initiative implementation.

1.5 Conceptual Framework and Hypotheses

The focused conceptual framework includes leadership commitment as the independent variable, change management as the mediating variable, and effective AI initiative implementation as the dependent variable. Figure 1 presents the paper-specific framework derived from the approved two-paper model logic.

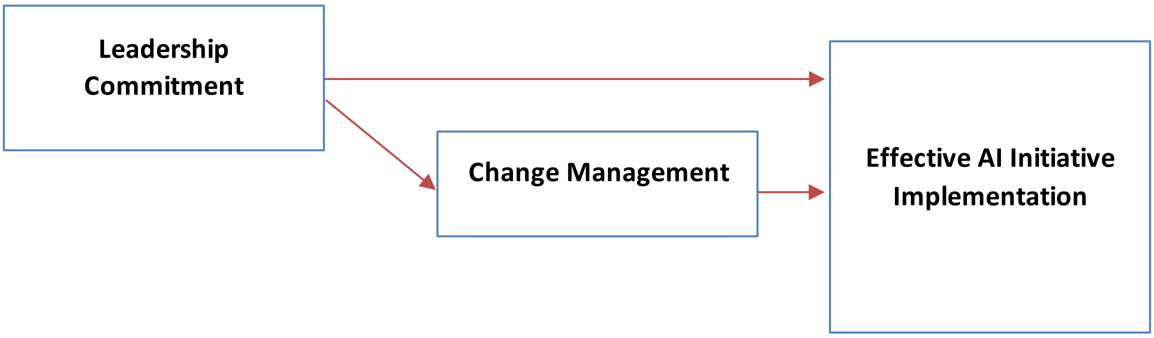

Figure 1 : Conceptual framework

Figure 1 illustrates the theoretical structure of the paper by separating the direct leadership pathway from the indirect pathway through change management. The framework assumes that leadership commitment can influence effective AI initiative implementation directly because leaders provide strategic direction, resources, and institutional support. At the same time, the model assumes that the strongest practical expression of leadership commitment occurs when leaders build change management capacity. In this sense, change management is not treated as a peripheral administrative activity, but as the mechanism that translates leadership intention into coordinated implementation practice. The framework therefore reflects a theoretically meaningful sequence in which leadership commitment strengthens transformation readiness, and transformation readiness then supports effective AI integration in healthcare administration.

2. Methodology

2.1 Research Design and Context

The study used a quantitative, deductive survey design to test hypothesized relationships among latent constructs in Saudi healthcare administration. This design was appropriate because the objective required statistical assessment of measured relationships rather than exploratory qualitative interpretation. The present paper reports a focused analysis from the broader empirical model and retains only constructs required for the selected leadership pathway: leadership commitment, change management, and effective AI initiative implementation. This focused design allows the paper to examine a coherent mechanism while remaining consistent with the broader data structure and PLS-SEM procedure reported in the source study. PLS-SEM is suitable for models emphasizing prediction, latent-variable relationships, and complex structural paths (Hair & Alamer, 2022). The research context was healthcare administration within hospitals affiliated with the Tabuk Health Cluster in Saudi Arabia. This setting was appropriate because healthcare administrators are positioned within systems that shape AI coordination, workflow redesign, staff preparation, and implementation monitoring. The population frame consisted of 546 healthcare administrators across 12 hospitals, based on Ministry of Health data (Ministry of Health, 2023). Recent SEM literature supports matching analytical approach to the model's measurement and structural purpose (Dash & Paul, 2021). The context supports examining the proposed leadership pathway.

2.2 Population, Sampling, and Data Collection

The empirical data were collected through a structured questionnaire administered to healthcare administrators, appropriate when standardized responses are required from a defined participant group (Ranganathan et al., 2024). The study reported 300 distributed questionnaires, 267 returned questionnaires, no incomplete responses, and 267 usable responses, producing a usable response rate of 89.00%. The final sample size provided an adequate basis for PLS-SEM because it enabled assessment of reliability, descriptive statistics, correlations, direct effects, and mediation effects. Recent PLS-SEM guidance cautions against relying only on simple rules of thumb and emphasizes sufficient statistical power (Jhantasana, 2023). The absence of incomplete responses strengthened dataset usability by eliminating imputation or case deletion. The sampling plan was derived from the finite population of healthcare administrators in the Tabuk Health Cluster. The source methodology discussed Krejcie and Morgan (1970) sample-size guidance and an oversampling rationale for online survey administration, consistent with recommendations to improve response rates in online surveys (Shiyab et al., 2023). The final analysis used 267 usable responses from administrators relevant to strategic coordination, change execution, and AI implementation.

2.3 Measurement of Constructs

The constructs measured for this focused paper were leadership commitment, change management, and effective AI initiative implementation. Leadership commitment was represented by items capturing strategic vision, resource allocation, AI planning participation, training support, goal communication, responsible AI use, strategic alignment, experimentation, proactive change, and cross-functional collaboration. Change management was represented by items capturing structured transition practices, preparation, training, communication, resistance management, stakeholder involvement, support, monitoring, and continuous improvement. Effective AI initiative implementation was represented by items capturing workflow integration, operational efficiency, monitoring, decision support, strategic alignment, training support, resource optimization, and performance metrics. All constructs were measured using structured Likert-type survey items, consistent with latent-variable measurement in survey-based SEM research (Cheung et al., 2024). Measurement quality was evaluated through internal consistency reliability, composite reliability, convergent validity, and item loading assessment. The refined measurement model retained items with acceptable loadings. Because reflective constructs in PLS-SEM require theoretically grounded indicators and appropriate evaluation criteria, the resulting statistics supported subsequent structural analysis (Guenther et al., 2025).

2.4 Data Analysis Procedure

The analysis included preliminary screening, descriptive statistics, reliability analysis, correlation assessment, measurement-model evaluation, structural-model assessment, and mediation analysis. The empirical model was assessed using PLS-SEM with bootstrapping to test path coefficients and indirect effects, consistent with current reporting guidance (Guenther et al., 2023). Bootstrapping was used to estimate standard errors, t-values, and p-values for the structural relationships and indirect effects within the PLS-SEM procedure (Hair & Alamer, 2022). Mediation was interpreted by examining direct and indirect leadership pathways involving leadership commitment, change management, and effective AI initiative implementation (Sarstedt & Moisescu, 2024).

3. Results

3.1 Response Profile

The final analysis was based on 267 usable questionnaires from 300 distributed questionnaires. The usable response rate of 89.00% provides a strong empirical foundation for testing the focused leadership pathway because it reflects substantial participation among the targeted healthcare administrators and reduces concerns about an insufficient analytical sample. Table 1 shows that the study achieved a high usable response rate, with 267 returned and usable questionnaires out of 300 distributed questionnaires. The unreturned questionnaires accounted for 11.00%, and no incomplete responses were recorded, which confirms that all returned instruments were suitable for analysis. This result strengthens confidence in the empirical dataset because the final sample was not reduced by missing or unusable responses. The usable response rate of 89.00% also provides a stable basis for applying PLS-SEM, as the analysis depends on sufficient observations to estimate measurement quality, structural relationships, and mediation effects. In theoretical terms, the strong response profile supports the credibility of the leadership pathway tested in this paper, because the findings are based on a substantial group of healthcare administrators whose perceptions are directly relevant to leadership commitment, change management, and AI implementation effectiveness.

Table 1 : Response Rate and Usable Sample

Questionnaire	Frequency	Percentage
Total distributed	300	100
Returned responses	267	89.00%
Unreturned	33	11.00%
Incomplete responses	0	0.00%
Usable responses	267	89.00%

The respondent profile includes administrators with varied demographic and professional characteristics. This variation supports the interpretation of the findings within the administrative healthcare setting examined in the study because it reflects responses from participants with different levels of education, experience, age, and organizational affiliation. Table 2 indicates that the sample was relatively balanced by gender, with 136 male respondents (50.9%) and 131 female respondents (49.1%). The age distribution was also broad, with the largest category being 46-50 years (15.7%) and the remaining groups distributed relatively evenly across early-career, mid-career, and senior age ranges. Educational diversity was evident, as respondents included PhD holders (18.7%), Master degree holders (19.9%), Bachelor degree holders (16.1%), Diploma holders (25.5%), and High School qualification holders (19.9%). The professional experience profile was similarly varied, with the largest group reporting more than 20 years of experience (22.1%). Organizational representation was distributed across private, public healthcare, research or academia, healthcare service provider, technology provider, and other organizational types. This demographic spread strengthens the interpretation of the findings because it suggests that the leadership and change-management perceptions are not limited to a narrowly defined participant subgroup.

Table 2 : Respondent Profile

Variable	Category	Frequency	Percent (%)
Gender	Male	136	50.9
	Female	131	49.1
Age	18–24	41	15.4
	25–30	35	13.1
	31–35	38	14.2
	36–40	37	13.9
	41–45	37	13.9
	46–50	42	15.7
	>50	37	13.9
Education	PhD	50	18.7
	Master	53	19.9
	Bachelor’s	43	16.1
	Diploma	68	25.5
	High School	53	19.9
Experience	1–5 years	53	19.9
	5–10 years	53	19.9
	11–15 years	51	19.1
	16–20 years	51	19.1
	>20 years	59	22.1
Organization Type	Private	42	15.7
	Public Healthcare	48	18
	Research / Academia	42	15.7
	Healthcare Service Provider	41	15.4
	Technology Provider	49	18.4
	Other	45	16.9

3.2 Measurement Model for the Focused Constructs

The measurement results demonstrated strong reliability and convergent validity for leadership commitment, change management, and effective AI initiative implementation. The retained items showed acceptable loading ranges, high internal consistency, and AVE values above the required level for the constructs included in this focused paper. Table 3 confirms that the focused constructs met the required measurement standards for subsequent structural analysis. Leadership commitment retained 12 items with loadings ranging from 0.769 to 0.888, Cronbach's alpha of 0.961, composite reliability of 0.962, and AVE of 0.700. Change management retained 20 items, with loadings ranging from 0.674 to 0.839, Cronbach's alpha of 0.964, composite reliability of 0.965, and AVE of 0.596. Effective AI initiative implementation retained 7 items, with loadings ranging from 0.767 to 0.851, Cronbach's alpha of 0.921, composite reliability of 0.922, and AVE of 0.679. These results indicate that the constructs were measured with strong internal consistency and adequate convergent validity. Theoretically, this strengthens the model because the tested leadership pathway depends on latent variables that are empirically coherent and sufficiently reliable.

Table 3 : Measurement Properties of the Focused Constructs

Construct	Retained items	Loading range	Cronbach's alpha	Composite reliability	AVE
Leadership Commitment	12	0.769-0.888	0.961	0.962	0.700
Change Management	20	0.674-0.839	0.964	0.965	0.596
Effective AI Initiative Implementation	7	0.767-0.851	0.921	0.922	0.679

Figure 2 demonstrates that the measurement model provides a statistically solid basis for testing the focused leadership pathway, as the retained indicators load appropriately on their intended constructs and show strong internal consistency. Leadership commitment and change management display particularly high reliability, while the AI implementation construct also shows acceptable measurement strength through its retained indicators. The loading ranges suggest that the observed items adequately represent the theoretical meaning of each latent construct, supporting the claim that leadership commitment, change management, and effective AI initiative implementation are empirically coherent dimensions. Theoretically, this strengthens the study because the subsequent mediation model depends on constructs that are not only conceptually relevant but also statistically stable, allowing stronger confidence in interpreting the structural relationships among them.

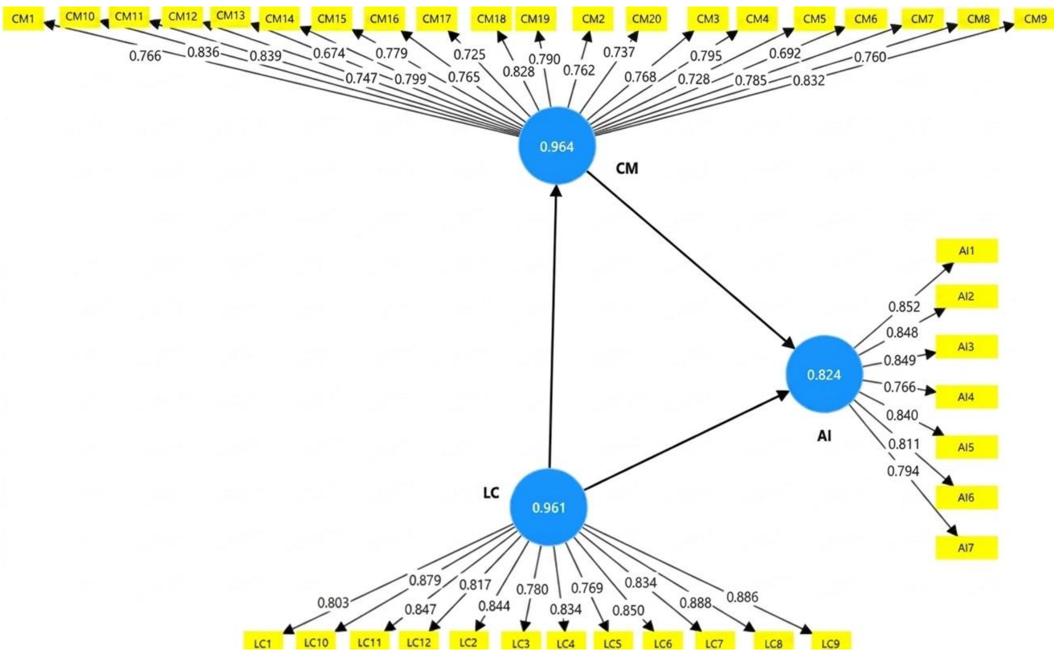

Figure 2 : Evaluation of Measurement Model (Initial Model)

3.3 Descriptive Statistics and Correlations

The construct means were above the scale midpoint, suggesting favorable perceptions of leadership commitment, change management, and effective AI initiative implementation. The correlations were positive and statistically significant at the 0.01 level, providing preliminary support for the hypothesized leadership pathway before the structural model was examined. Table 4 shows that respondents reported generally favorable perceptions across the three focused constructs, with leadership commitment recording the highest mean (M = 4.162, SD = 0.705), followed by change management (M = 4.056, SD = 0.718) and effective AI initiative implementation (M = 4.053, SD = 0.543). These results indicate that respondents tended to agree that leadership support, organized change processes, and AI implementation effectiveness were present in the healthcare administrative context examined. The correlation results further support the expected theoretical relationships. Leadership commitment was positively correlated with change management (r = .638) and effective AI initiative implementation (r = .623), while change management had the strongest correlation with effective AI initiative implementation (r = .745). The strength of the change management-AI relationship is theoretically important because it suggests that structured transition capacity is closely associated with successful AI integration.

Table 4 : Descriptive Statistics and Correlations

Variable	N	Mean	Std. Deviation	LC	CM	AI
Leadership Commitment	267	4.162	0.705	1		
Change Management	267	4.056	0.718	.638**	1	
Effective AI Initiative Implementation	267	4.053	0.543	.623**	.745**	1

** Correlation is significant at the 0.01 level (2-tailed). Only constructs relevant to this paper are shown.

Figure 3 shows that the focused model has meaningful predictive relevance for the endogenous constructs, particularly effective AI initiative implementation and change management. The Q^2 value for AI indicates that the model has strong capacity to predict implementation effectiveness, while the positive Q^2 value for change management confirms that leadership commitment contributes to explaining structured transformation capability. The zero value for leadership commitment is expected because it functions as the exogenous construct in the model rather than an outcome being predicted. Theoretically, these results strengthen the argument that AI implementation is not explained by leadership support alone, but by the pathway through which leadership commitment develops change-management capacity, which then becomes a key mechanism for achieving effective AI integration in healthcare administration.

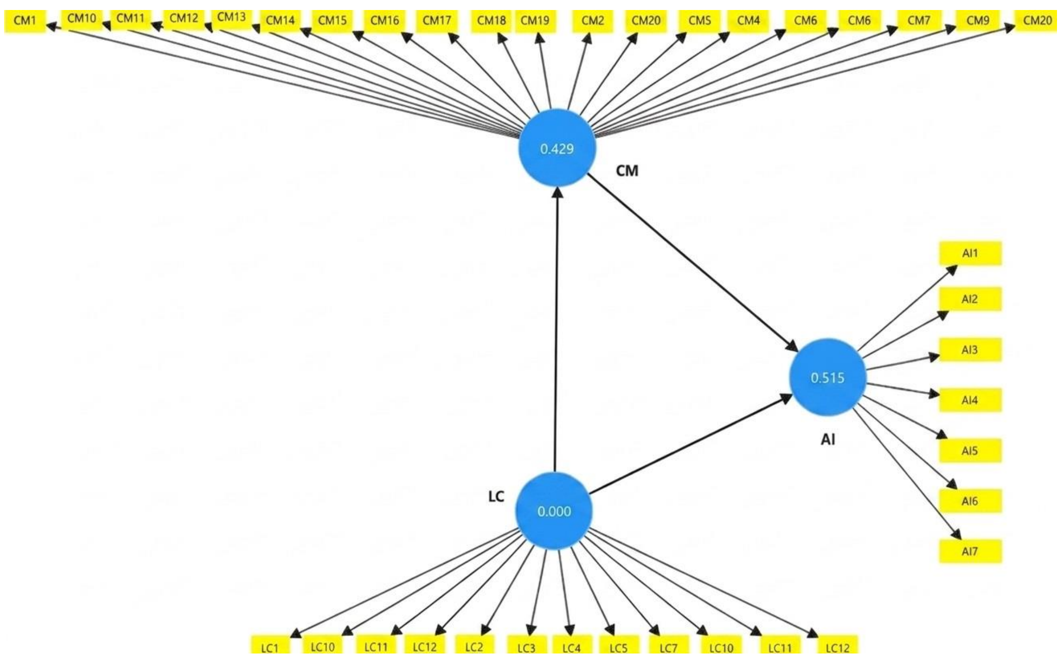

Figure 3 : The Predictive Relevance Model (Q2) (Construct Cross-Validated Redundancy).

Figure 4 indicates that the construct-level communality results support the measurement strength of the focused model, especially for change management and effective AI initiative implementation. The positive value for change management shows that its retained indicators share sufficient predictive and explanatory relevance with the construct they represent, while the stronger value for AI implementation suggests that the AI indicators collectively capture the underlying implementation construct with meaningful empirical consistency. The zero value for leadership commitment is not problematic because leadership commitment operates as the exogenous starting point in the model. Theoretically, this result reinforces the argument that the model is built on coherent constructs, allowing the study to interpret the leadership–change–implementation pathway with stronger confidence rather than treating the findings as isolated statistical associations.

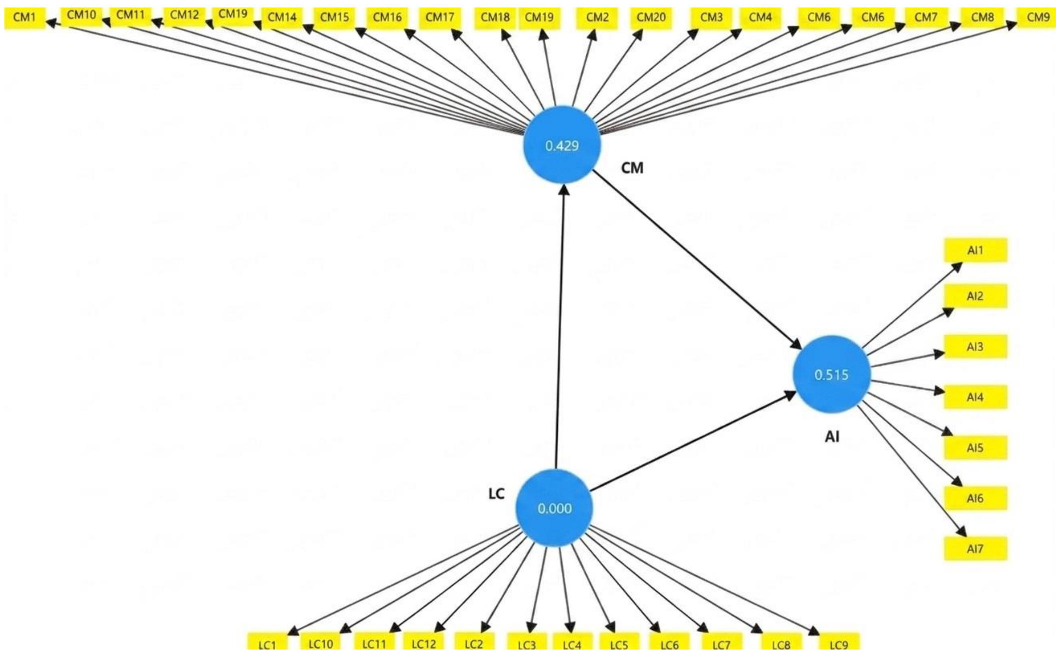

Figure 4 : The Predictive Relevance Model (Q2) (Construct Cross-Validated Communality).

3.4 Direct Structural Effects

The direct effects relevant to this paper were statistically significant. Leadership commitment was positively related to effective AI initiative implementation and strongly related to change management, while change management was the strongest direct predictor of effective AI initiative implementation. Table 5 provides the direct structural evidence for the focused model. Leadership commitment had a significant positive direct effect on effective AI initiative implementation (beta = 0.199, t = 2.072, p = 0.003), supporting the proposition that committed leadership contributes directly to implementation effectiveness. Leadership commitment also had a stronger positive effect on change management (beta = 0.559, t = 5.715, p = 0.000), indicating that strategic leadership support is closely linked to the development of structured transformation processes. The strongest direct effect was from change management to effective AI initiative implementation (beta = 0.945, t = 13.457, p = 0.000), with a large f-square of 0.991. Theoretically, this pattern shows that leadership commitment matters, but its strongest contribution appears to be the formation of change-management capacity that can translate strategic support into implementation outcomes.

Table 5 : Direct Structural Path Results

Path	Beta	Sample Mean (M)	SD	T statistics	P values	f-square	Decision
LC -> AI	0.199	0.077	0.096	2.072	0.003	0.004	Supported
LC -> CM	0.559	0.562	0.098	5.715	0.000	0.214	Supported
CM -> AI	0.945	0.946	0.070	13.457	0.000	0.991	Supported

LC = Leadership Commitment; CM = Change Management; AI = Effective AI Initiative Implementation.

3.5 Mediation and Model-Level Evidence

The indirect effect from leadership commitment to effective AI initiative implementation through change management was statistically significant. Because the direct effect also remained statistically significant, the verified evidence supports partial mediation rather than full mediation for the focused leadership pathway. Table 6 demonstrates that the mediation pathway was statistically supported, as the indirect effect of leadership commitment on effective AI initiative implementation through change management was positive and significant (beta = 0.528, t = 5.372, p = 0.000). This result means that leadership commitment contributes to AI implementation not only through a direct path but also through its ability to strengthen organized change processes. The model-level indicators provide additional support for the structural interpretation. The R-square value for effective AI initiative implementation was 0.768, while the adjusted R-square was 0.766, indicating substantial explained variance. Change management also showed strong explanatory evidence, with R-square of 0.743 and adjusted R-square of 0.741. Predictive relevance was strong for both effective AI initiative implementation (Q2predict = 0.524) and change management (Q2predict = 0.736), while the SRMR value of 0.067 indicated acceptable model fit.

Table 6 : Mediation and Structural Model Context

Indicator	Value/Beta	Sample Mean (M)	SD	T statistics	P values	Decision/Interpretation
LC -> CM -> AI	0.528	0.531	0.098	5.372	0.000	Supported
R-square: AI	0.768					Context
R-square adjusted: AI	0.766					Context
R-square: CM	0.743					Context
R-square adjusted: CM	0.741					Context
Q2predict: AI	0.524					Context
Q2predict: CM	0.736					Context
SRMR: Saturated / Estimated model	0.067 / 0.067					Acceptable fit indicator

LC = Leadership Commitment; CM = Change Management; AI = Effective AI Initiative Implementation.

Figure 5 demonstrates that leadership commitment contributes to effective AI initiative implementation through both a direct and an indirect pathway. The significant path from leadership commitment to change management (β = 0.559, p = 0.000) shows that committed leadership strengthens the organizational capacity needed to manage transformation. The strong path from change management to AI implementation (β = 0.945, p = 0.000) indicates that structured change practices are the most powerful mechanism for converting leadership support into implementation effectiveness. Although the direct effect of leadership commitment on AI implementation remains significant (β = 0.199, p = 0.003), its smaller size confirms partial mediation. Theoretically, the model suggests that leadership becomes most influential when translated into disciplined change capability.

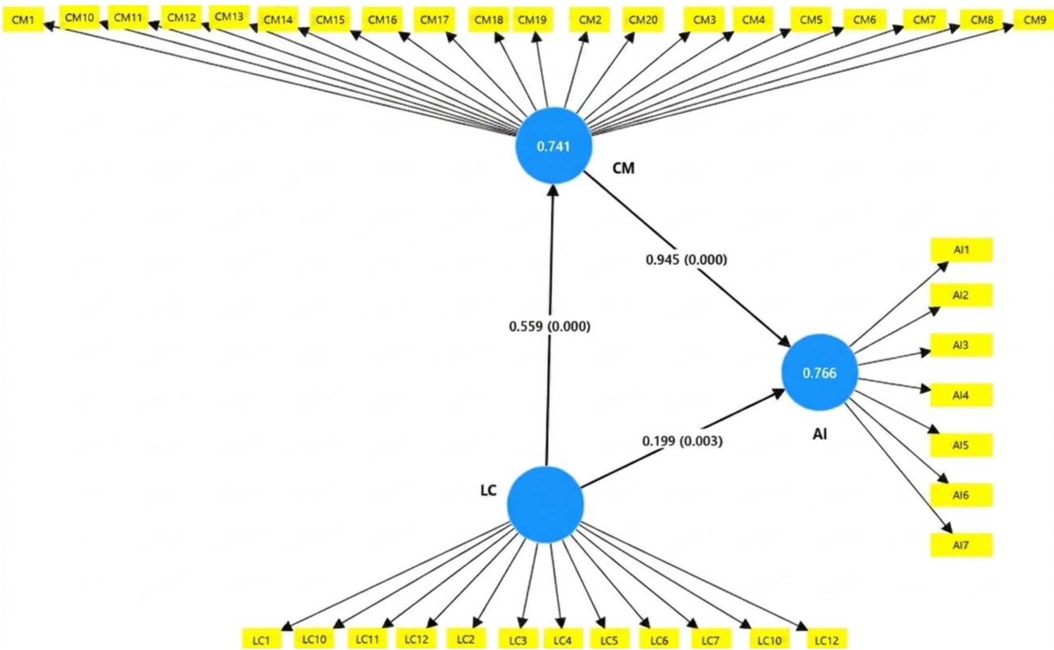

Figure 5 : Path Model Results of Mediation

4. Discussion

4.1 Theoretical Implications

The findings support the argument that leadership commitment is a significant antecedent of effective AI initiative implementation in Saudi healthcare administration. The significant direct effect indicates that strategic support, resource mobilization, communication, and active administrative engagement contribute to AI implementation outcomes. This relationship is important because it confirms that AI initiatives require visible leadership sponsorship rather than passive approval. In healthcare administration, leaders shape priorities, authorize resources, and reduce uncertainty surrounding new technologies. Recent AI implementation evidence identifies leadership, engagement, workflow, training, evaluation, monitoring, and ethics as core implementation-strategy concepts (Nair et al., 2024). The result therefore strengthens the theoretical view that leadership commitment functions as a strategic driver in complex digital transformation settings. The stronger path from leadership commitment to change management shows that leadership commitment builds structured transformation capacity. Leaders do not only influence AI implementation by expressing support; they also create the conditions through which change becomes organized, communicated, monitored, and sustained. This finding aligns with digital transformation literature that emphasizes leadership as a driver of institutional alignment and coordinated change. Within this framework, leadership commitment is best understood as both a strategic antecedent and an enabling force for change-management capability.

The strong path from change management to effective AI initiative implementation indicates that structured transition processes are central to AI success. This result supports the argument that complex healthcare technologies require implementation frameworks that address human, procedural, and governance dimensions (Harrison et al., 2021). Theory-based AI implementation evidence further shows that adoption depends on engagement, inner-setting readiness, data quality, interoperability, and implementation-science expertise (Chomutare et al., 2022). The theoretical implication is that implementation effectiveness depends less on AI technology alone and more on the organizational capacity to absorb, adapt, and institutionalize AI-enabled processes. Change management therefore occupies a central position because it converts strategic intention into practical implementation routines. The mediation result provides the main theoretical contribution of this paper. The evidence supports partial mediation because both the direct effect of leadership commitment and the indirect effect through change management were statistically significant. This means leadership commitment contributes independently to implementation effectiveness while also operating through structured change management. The finding refines the conceptual logic of AI implementation by showing that leadership commitment is not a single-path determinant. Instead, it works through a dual mechanism: direct strategic influence and indirect operational transformation. This dual mechanism explains how leadership support becomes measurable AI implementation effectiveness in healthcare administration.

4.2 Practical Implications

For Saudi healthcare administrators, the results indicate that successful AI implementation requires visible and sustained leadership commitment. Leaders should communicate a clear AI vision, allocate financial and technical resources, support training, and maintain active engagement throughout the implementation process. However, the findings also show that leadership commitment becomes most valuable when it is translated into structured change management. Leaders should therefore avoid limiting their role to approving AI projects. Instead, they should sponsor transition plans, remove barriers, coordinate cross-functional work, and monitor implementation progress. This approach can help healthcare organizations reduce resistance, strengthen employee readiness, and embed AI-enabled practices into routine administrative processes. The relatively small f-square value for the direct leadership commitment path indicates that leadership may have limited unique explanatory strength when change management is included in the model. Practically, this means that leadership support is not sufficient if it remains symbolic or disconnected from implementation systems. Healthcare organizations should design AI governance and implementation plans that make leadership responsibilities explicit. These responsibilities should include resource approval, communication, ethical oversight, staff support, risk monitoring, and performance review. By linking leadership commitment to formal change-management activities, organizations can improve the probability that AI initiatives will move from strategic intention to sustainable administrative practice.

The strong effect of change management on effective AI initiative implementation suggests that Saudi healthcare organizations should invest in transition structures as seriously as they invest in technology acquisition. This includes training programs, stakeholder engagement, communication plans, resistance-management procedures, feedback channels, and continuous improvement mechanisms. Such practices are especially important in healthcare because AI adoption may affect professional routines, accountability structures, and trust in administrative and clinical decision support. The findings therefore imply that implementation success depends on creating a disciplined organizational pathway in which employees understand why AI is being introduced, how it changes work, and what support is available during the transition.

4.3 Limitations and Future Research

This paper is limited by the cross-sectional survey design, which restricts claims about causal ordering. Although the tested model is theoretically grounded and statistically supported, longitudinal research would be valuable for examining how leadership commitment influences change management and AI implementation across different project phases. Future studies could assess whether leadership commitment is most influential during initiation, implementation, stabilization, or continuous improvement stages. Such research would provide a more dynamic understanding of the leadership pathway and would help distinguish short-term implementation effects from sustained institutionalization of AI-enabled practices. The study relied on self-reported perceptions from healthcare administrators. While these perceptions are highly relevant because administrators directly experience leadership support, change processes, and AI-related coordination, future research could combine survey responses with additional evidence. Project performance indicators, implementation documents, system adoption metrics, interviews, or case studies could provide a more complete understanding of how the leadership pathway operates in practice. Future studies could also compare different healthcare regions, private hospitals, or national health systems to determine whether the same mediation pattern appears across diverse institutional settings.

Future research may also investigate whether different forms of leadership behavior have distinct effects on change management and AI implementation. For example, strategic leadership, ethical leadership, transformational leadership, and digital leadership may influence AI implementation through different mechanisms. Examining these leadership forms separately would clarify which leadership practices are most effective during complex healthcare technology transformation. Additional research could also test whether organizational culture, digital maturity, employee readiness, governance quality, or AI literacy moderate the relationship between leadership commitment, change management, and effective AI implementation.

5. Conclusion

This paper examined the relationship between leadership commitment and effective AI initiative implementation in Saudi healthcare administration, with change management tested as the mediating mechanism. The verified results showed that leadership commitment had a significant direct relationship with effective AI initiative implementation and a stronger relationship with change management. Change management was the strongest direct predictor of effective AI initiative implementation and significantly mediated the leadership pathway. Because the direct leadership effect remained significant while the indirect effect through change management was also significant, the evidence supports partial mediation. The main conclusion is that committed leadership matters most when it is translated into structured implementation capacity. Saudi healthcare organizations seeking successful AI adoption should therefore combine strategic leadership commitment with systematic change management practices that prepare employees, coordinate workflows, manage resistance, and sustain AI-enabled transformation.

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