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ARTIFICIAL INTELLIGENCE-AUGMENTED ETHICAL LEADERSHIP AND JUDICIAL EFFECTIVENESS: THE MEDIATING ROLE OF INSTITUTIONAL TRUST AND THE MODERATING ROLE OF DIGITAL GOVERNANCE CAPACITY

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Abstract

*The rapid integration of Artificial Intelligence (AI) into judicial systems has created significant opportunities for enhancing judicial efficiency, transparency, and decision-making while simultaneously raising ethical and governance challenges. This study examined the influence of Artificial Intelligence-Augmented Ethical Leadership **on** Judicial Effectiveness**,** considering the mediating role of Institutional Trust and the moderating role **of** Digital Governance Capacity**.** Grounded in Socio-Technical Systems Theory, the study proposed that the successful implementation of AI within judicial institutions depends on the effective integration of ethical leadership and technological capabilities. A quantitative, cross-sectional research design was employed, and data were collected through a structured questionnaire administered to judicial officers, court administrators, and legal professionals. The proposed conceptual model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM)**.** The findings indicated that Artificial Intelligence-Augmented Ethical Leadership significantly enhanced Judicial Effectiveness directly and indirectly through Institutional Trust. Moreover, Digital Governance Capacity strengthened the positive relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness, highlighting the importance of institutional readiness for successful AI implementation. The study contributes to the literature on ethical leadership, artificial intelligence governance, judicial administration, and public sector digital transformation by providing an integrated framework that explains how responsible AI leadership improves judicial performance. The findings offer practical guidance for policymakers and judicial administrators in designing ethical AI governance frameworks, strengthening institutional trust,*

and enhancing digital governance capabilities to achieve sustainable judicial effectiveness.

INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative technologies shaping governance systems, public administration, and judicial institutions in the twenty-first century. The integration of AI into judicial systems has significantly enhanced case management, legal research, evidence analysis, document processing, and administrative decision-making, thereby improving operational efficiency and service delivery. Governments across both developed and developing countries are increasingly adopting AI-driven solutions to address longstanding judicial challenges such as case backlogs, delayed judgments, limited transparency, and administrative inefficiencies (United Nations, 2024). However, the effectiveness of AI implementation depends not only on technological advancement but also on leadership capable of ensuring responsible, transparent, and ethical use of intelligent technologies.

Ethical leadership has become an essential component of successful digital transformation because it emphasizes integrity, fairness, accountability, transparency, and responsible decision-making (Brown & Treviño, 2006). In judicial institutions, ethical leadership ensures that AI technologies complement rather than replace judicial reasoning while preserving judicial independence, procedural justice, and citizens' constitutional rights. Artificial Intelligence-Augmented Ethical Leadership represents an emerging leadership paradigm in which ethical leaders utilize AI-generated insights to support evidence-based decision-making while maintaining human oversight and ethical accountability (Dwivedi et al., 2023). Such leadership facilitates responsible AI governance by minimizing algorithmic bias, promoting transparency, and ensuring compliance with legal and ethical standards.

Judicial effectiveness refers to the ability of courts and judicial institutions to deliver timely, impartial, transparent, accessible, and high-quality justice while maintaining public confidence and institutional legitimacy (World Justice Project, 2024). Although AI technologies offer considerable opportunities for improving judicial performance, technological innovation alone cannot guarantee effective judicial outcomes. The success of AI-enabled judicial reforms depends substantially on citizens' trust in judicial institutions and the institutional capacity to govern digital technologies responsibly.

Institutional trust represents citizens' confidence in the fairness, competence, transparency, and integrity of public institutions. Ethical leadership enhances institutional trust by demonstrating fairness, accountability, consistency, and transparency, while responsible AI implementation further strengthens public confidence by ensuring explainability, privacy protection, and human oversight (Lahusen et al., 2024). Consequently, institutional trust may serve as a critical mechanism through which AI-Augmented Ethical Leadership improves judicial effectiveness.

Furthermore, Digital Governance Capacity reflects an institution's ability to develop, implement, regulate, and monitor digital technologies through appropriate infrastructure, skilled human resources, cybersecurity mechanisms, legal frameworks, and organizational readiness (OECD, 2024). Judicial institutions with stronger digital governance capacity are more capable of translating AI-enabled ethical leadership into improved judicial performance than institutions with weaker technological capabilities. Therefore, Digital Governance Capacity may strengthen the effectiveness of AI-Augmented Ethical Leadership in enhancing judicial outcomes.

Despite growing scholarly interest in artificial intelligence, ethical leadership, judicial modernization, and digital governance, limited empirical research has integrated these variables into a comprehensive framework. Existing studies largely examine AI adoption, leadership, institutional trust, and judicial effectiveness separately, leaving important theoretical and

empirical gaps regarding the mechanisms through which AI-supported ethical leadership influences judicial performance. Accordingly, this study investigates the direct relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness, the mediating role of Institutional Trust, and the moderating role of Digital Governance Capacity.

Problem Statement

Judicial institutions worldwide are experiencing increasing pressure to improve efficiency, transparency, accountability, and accessibility while responding to growing case volumes and rising public expectations. Although governments are investing heavily in Artificial Intelligence technologies to modernize judicial administration, many judicial systems continue to face persistent challenges including procedural delays, inconsistent decision-making, inadequate transparency, declining institutional trust, and limited technological readiness (United Nations, 2024; World Justice Project, 2024). These challenges indicate that technological innovation alone is insufficient to improve judicial effectiveness without ethical leadership and robust governance mechanisms.

Existing literature has extensively examined ethical leadership, AI adoption, judicial performance, institutional trust, and digital governance as separate research domains (Brown & Treviño, 2006; Dwivedi et al., 2023). However, limited empirical research has investigated how Artificial Intelligence-Augmented Ethical Leadership influences Judicial Effectiveness within judicial institutions. More importantly, insufficient attention has been given to the role of Institutional Trust as an explanatory mechanism linking AI-supported ethical leadership with judicial outcomes.

Furthermore, although Digital Governance Capacity has been recognized as a prerequisite for successful AI implementation, its moderating role in strengthening the relationship between AI-Augmented Ethical Leadership and Judicial Effectiveness remains largely unexplored. This gap is particularly evident in developing countries where judicial institutions frequently encounter resource constraints, technological limitations, governance challenges, and low public trust.

Therefore, there is a need for an integrated empirical study that examines how Artificial Intelligence-Augmented Ethical Leadership enhances Judicial Effectiveness through Institutional Trust while considering the influence of Digital Governance Capacity. Addressing these gaps will contribute to leadership theory, AI governance literature, judicial administration, and public sector digital transformation.

Research Questions

- Does Artificial Intelligence-Augmented Ethical Leadership significantly influence Judicial Effectiveness?
- Does Artificial Intelligence-Augmented Ethical Leadership significantly influence Institutional Trust?
- Does Institutional Trust significantly influence Judicial Effectiveness?
- Does Institutional Trust mediate the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness?
- Does Digital Governance Capacity moderate the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness?

Research Objectives

General Objective

To examine the influence of Artificial Intelligence-Augmented Ethical Leadership on Judicial Effectiveness through the mediating role of Institutional Trust and the moderating role of Digital Governance Capacity.

Specific Objectives

- To examine the effect of Artificial Intelligence-Augmented Ethical Leadership on Judicial Effectiveness.
- To investigate the effect of Artificial Intelligence-Augmented Ethical Leadership on Institutional Trust.
- To examine the effect of Institutional Trust on Judicial Effectiveness.

- To determine the mediating role of Institutional Trust in the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness.
- To investigate the moderating role of Digital Governance Capacity in the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness.

Significance of the Study

This study makes important theoretical, empirical, practical, and policy contributions. Theoretically, it extends the ethical leadership literature by integrating Artificial Intelligence into leadership processes within judicial institutions. The study also enriches Socio-Technical Systems Theory by demonstrating how social and technological systems jointly influence judicial effectiveness through institutional trust and digital governance capacity.

Empirically, the study contributes to the emerging literature on AI governance by simultaneously examining direct, mediating, and moderating relationships within a unified conceptual framework. The findings will provide evidence regarding the mechanisms through which AI-Augmented Ethical Leadership improves judicial effectiveness, thereby addressing significant gaps in contemporary public administration and judicial governance research.

Practically, the findings will assist judicial administrators, policymakers, court managers, and government agencies in developing strategies for responsible AI implementation. The study will provide guidance for strengthening ethical leadership capabilities, improving institutional trust, enhancing digital governance capacity, and promoting evidence-based judicial reforms.

From a policy perspective, the research supports national digital transformation initiatives by informing the development of AI governance frameworks, judicial modernization strategies, digital capacity-building programs, and ethical AI regulations. The findings will help policymakers balance technological innovation with judicial independence, accountability, transparency, and public trust.

Finally, the study establishes a foundation for future research investigating AI-enabled leadership across other public sector organizations and contributes to the broader discourse on responsible artificial intelligence, digital governance, and sustainable public sector innovation.

Literature Review

Underpinning Theory

Socio-Technical Systems (STS) Theory

The present study is grounded in Socio-Technical Systems (STS) Theory, originally developed by Trist and Bamforth (1951) and subsequently expanded by Bostrom and Heinen (1977). STS Theory argues that organizational effectiveness results from the joint optimization of social systems (leadership, ethics, organizational culture, trust, governance, and human behavior) and technical systems (technology, artificial intelligence, digital infrastructure, information systems, and automation). Rather than emphasizing technology or people independently, STS Theory posits that sustainable organizational performance is achieved when technological innovations are effectively integrated with human values and organizational processes.

Within judicial institutions, Artificial Intelligence (AI) represents the technical subsystem that enhances legal research, case management, evidence analysis, judicial administration, and decision-support processes. Ethical leadership constitutes the social subsystem that ensures AI technologies are implemented responsibly through fairness, accountability, transparency, integrity, and human oversight. Institutional trust reflects the social outcome resulting from ethical governance, while digital governance capacity represents the institutional capability to integrate AI technologies effectively through appropriate infrastructure, regulations, cybersecurity, digital competencies, and governance mechanisms.

STS Theory therefore provides an appropriate theoretical lens for explaining how Artificial Intelligence-Augmented Ethical Leadership enhances Judicial Effectiveness by strengthening Institutional Trust while recognizing that Digital Governance Capacity conditions the effectiveness of AI implementation. The theory emphasizes that

AI alone cannot improve judicial performance unless it is supported by ethical leadership, institutional readiness, and effective governance structures.

The application of STS Theory has become increasingly relevant in AI governance literature because researchers consistently argue that organizational success in AI implementation depends on balancing technological innovation with ethical governance, stakeholder trust, and institutional capabilities (Dwivedi et al., 2023; OECD, 2024). Consequently, STS Theory provides a comprehensive theoretical foundation for explaining the relationships proposed in this study.

Artificial Intelligence-Augmented Ethical Leadership

Ethical leadership has long been recognized as one of the most influential leadership styles promoting organizational integrity, fairness, transparency, and accountability. Brown and Treviño (2006) define ethical leadership as the demonstration of normatively appropriate conduct through personal actions, interpersonal relationships, communication, and decision-making while encouraging ethical behavior among organizational members. Ethical leaders emphasize justice, honesty, responsibility, respect, and moral decision-making, thereby strengthening organizational legitimacy and stakeholder confidence.

The emergence of Artificial Intelligence has transformed traditional leadership by introducing AI-supported decision-making systems that enhance analytical capability, evidence-based management, and organizational intelligence. Artificial Intelligence-Augmented Ethical Leadership refers to leaders' ability to utilize AI technologies while maintaining ethical principles, human judgment, transparency, fairness, and accountability. Rather than replacing leaders, AI functions as an intelligent decision-support system that enhances leadership effectiveness by processing large volumes of information, identifying patterns, improving forecasting accuracy, and supporting objective decision-making (Dwivedi et al., 2023).

Recent studies suggest that AI-augmented leaders are better positioned to improve organizational performance because they combine technological intelligence with ethical reasoning. However, scholars emphasize that AI implementation within public institutions must remain human-centered, ensuring explainability, algorithmic fairness, privacy protection, and legal accountability (UNESCO, 2021). OECD (2024) similarly argues that trustworthy AI requires transparency, robustness, accountability, human oversight, and responsible governance throughout the AI lifecycle.

Within judicial institutions, AI supports case scheduling, legal document analysis, evidence management, predictive analytics, sentencing assistance, and administrative decision-making. Nevertheless, ethical leadership remains indispensable because judicial decisions involve legal interpretation, moral reasoning, procedural fairness, and constitutional responsibilities that cannot be delegated entirely to AI systems. Accordingly, AI-augmented ethical leadership represents an emerging governance approach that combines technological innovation with ethical responsibility to improve judicial administration while preserving judicial independence.

Judicial Effectiveness

Judicial effectiveness refers to the ability of judicial institutions to deliver timely, impartial, transparent, accessible, efficient, and high-quality justice while maintaining judicial independence and public confidence. Effective judicial systems strengthen the rule of law, democratic governance, investor confidence, economic development, and social stability (World Justice Project, 2024).

Many judicial systems continue to experience increasing case backlogs, procedural delays, limited transparency, inconsistent judgments, inadequate resource allocation, and declining public trust. These challenges have motivated governments worldwide to adopt AI-enabled judicial reforms aimed at improving administrative efficiency and service delivery. AI technologies are increasingly applied in legal research, intelligent document management, predictive case analysis, automated scheduling,

and courtroom administration (United Nations, 2024).

Despite these technological advancements, researchers consistently argue that judicial effectiveness depends not only on digital technologies but also on ethical governance, judicial independence, institutional legitimacy, and public confidence. AI-supported judicial systems achieve greater effectiveness when technological implementation is accompanied by transparent governance mechanisms, ethical oversight, accountability frameworks, and human-centered decision-making (OECD, 2024). Therefore, ethical leadership remains a fundamental determinant of successful judicial modernization.

Institutional Trust

Institutional trust refers to citizens' confidence in the competence, fairness, integrity, transparency, reliability, and legitimacy of public institutions. Trust represents one of the most important determinants of institutional effectiveness because citizens' willingness to comply with governmental decisions largely depends upon their confidence in institutional integrity.

Within judicial institutions, institutional trust reflects public confidence that judges, courts, and judicial administrators make impartial, lawful, transparent, and ethically responsible decisions. Ethical leadership strengthens institutional trust by demonstrating procedural justice, fairness, accountability, transparency, and integrity (Brown & Treviño, 2006). Similarly, responsible AI governance contributes to institutional trust when AI systems are explainable, unbiased, transparent, and subject to effective human oversight.

Recent AI governance literature emphasizes that trust represents one of the greatest challenges facing AI adoption within public institutions. Citizens generally support AI-assisted administrative functions but remain cautious regarding fully autonomous judicial decision-making because of concerns related to algorithmic bias, privacy, accountability, discrimination, and explainability (Lahusen et al., 2024). Consequently, ethical leadership becomes essential for communicating AI governance principles and strengthening citizens' trust during digital transformation.

Institutional trust therefore serves as an important psychological mechanism through which Artificial Intelligence-Augmented Ethical Leadership enhances Judicial Effectiveness.

Digital Governance Capacity

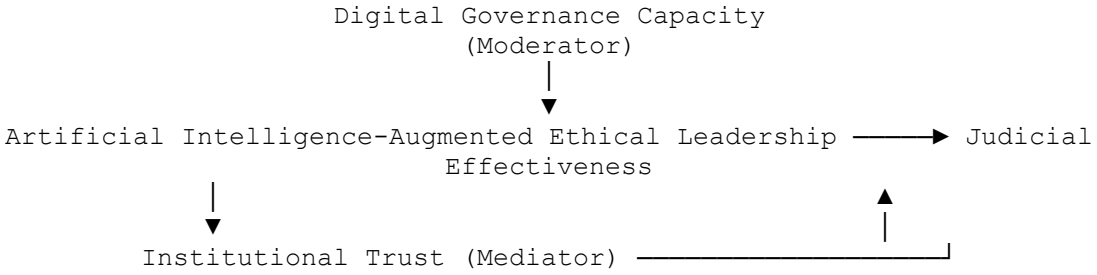
Digital Governance Capacity refers to an organization's ability to effectively design, implement, regulate, monitor, and continuously improve digital technologies through appropriate infrastructure, skilled personnel, governance mechanisms, legal frameworks, cybersecurity systems, and digital competencies.

Recent public administration research identifies digital governance capacity as one of the strongest organizational determinants of successful AI implementation. Institutions possessing advanced digital governance capacity are better able to integrate AI responsibly while ensuring transparency, accountability, explainability, cybersecurity, and legal compliance (OECD, 2024).

The United Nations (2024) emphasizes that successful digital transformation requires comprehensive governance ecosystems involving digital infrastructure, regulatory readiness, human resource development, data governance, and institutional coordination. Similarly, AI governance scholars argue that organizations with stronger digital governance capabilities achieve higher AI adoption success, better organizational performance, and greater public trust because they effectively manage technological risks and ethical challenges (Dwivedi et al., 2023).

Therefore, Digital Governance Capacity is expected to strengthen the effectiveness of Artificial Intelligence-Augmented Ethical Leadership by enabling judicial institutions to implement AI technologies responsibly and efficiently.

Conceptual Framework



Hypotheses

H1: Artificial Intelligence-Augmented Ethical Leadership has a positive and significant effect on Judicial Effectiveness.

H2: Artificial Intelligence-Augmented Ethical Leadership has a positive and significant effect on Institutional Trust.

H3: Institutional Trust has a positive and significant effect on Judicial Effectiveness.

H4: Institutional Trust mediates the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness.

H5: Digital Governance Capacity positively moderates the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness.

Methodology

This study was conducted to examine the influence of Artificial Intelligence-Augmented Ethical Leadership on Judicial Effectiveness, with Institutional Trust as a mediating variable and Digital Governance Capacity as a moderating variable. The methodology was designed to ensure methodological rigor, reliability, and validity in measuring the proposed relationships.

Research Design

A quantitative, cross-sectional survey research design was adopted. The design was considered appropriate because the study aimed to examine relationships among multiple constructs and test mediation and moderation effects using statistical techniques. Data were collected at a single point in time from respondents working within judicial institutions. The cross-sectional approach was selected due to its suitability for examining perceptions, attitudes, and organizational phenomena in a large population efficiently and economically.

Population

The target population consisted of judicial officers, court administrators, legal professionals, and senior employees working within judicial institutions. These respondents were selected because they possessed direct knowledge of leadership practices, digital governance initiatives, institutional trust, and judicial performance within their organizations.

Sampling Technique

A stratified random sampling technique was employed to ensure adequate representation of different categories of respondents within the judicial system. The population was first divided into relevant strata, such as judges, court administrators, and legal officers. Respondents were then selected randomly from each stratum to reduce sampling bias and improve the representativeness of the sample.

Sample Size

The sample size was determined using established guidelines for structural equation modeling and multivariate analysis. A minimum sample of 300 respondents was targeted to ensure sufficient statistical power for testing direct, mediating, and moderating relationships. This sample size exceeded the minimum recommendations for Partial Least Squares Structural Equation Modeling (PLS-SEM), which generally requires a sample size adequate to estimate the most complex relationship in the model (Hair et al., 2022).

Data Collection Procedures

Data were collected through a structured questionnaire. Prior to full-scale data collection, the instrument was reviewed by academic experts and practitioners to assess clarity, relevance, and content adequacy. A pilot study was then conducted with a small group of respondents to identify ambiguities and refine the questionnaire. Following the pilot study, formal permission was obtained from relevant judicial authorities. Questionnaires were distributed to respondents through official channels and electronic platforms where appropriate. Participation was voluntary, and respondents were informed about the purpose of the study, confidentiality of responses, and their right to withdraw at any stage. Completed questionnaires were screened for completeness before data entry and analysis.

Instruments and Measures

All constructs were measured using previously validated scales adapted from the leadership, governance, and public administration literature. Responses were recorded on a five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

Artificial Intelligence-Augmented Ethical Leadership

Independent Variable

This construct measured the extent to which leaders ethically integrated AI technologies into decision-making processes while maintaining transparency, accountability, fairness, and human oversight. Items were adapted from ethical leadership scales developed by Brown and Treviño (2006) and supplemented with AI governance dimensions from recent AI leadership literature.

Judicial Effectiveness

Dependent Variable

This construct assessed perceptions of judicial efficiency, transparency, accessibility, consistency, timeliness, and quality of service delivery. The scale was adapted from judicial performance and public sector effectiveness literature.

Institutional Trust

Mediator

This construct measured respondents' confidence in the competence, fairness, integrity, and reliability of judicial institutions. Items were adapted from established institutional trust measures used in governance research.

Digital Governance Capacity

Moderator

This construct captured the institution's technological readiness, digital infrastructure, cybersecurity capability, regulatory frameworks, and organizational competence for managing AI and digital technologies. The scale was adapted from digital governance and e-government studies.

Reliability and Validity

Reliability

Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR). Values of 0.70 or higher were considered acceptable indicators of reliability (Hair et al., 2022). During the pilot study, all scales demonstrated satisfactory reliability, and any items with low item-total correlations were revised or removed.

Validity

Several procedures were undertaken to establish validity:

1. **Content Validity**

Content validity was established through expert review by scholars in leadership, public administration, and judicial governance. Experts evaluated the relevance, clarity, and comprehensiveness of each item in relation to the study constructs.

2. **Construct Validity**

Construct validity was assessed through confirmatory factor analysis (CFA) and the measurement model evaluation within PLS-SEM. Factor loadings of 0.70 or above were considered satisfactory indicators of convergent validity.

3. **Convergent Validity**

Convergent validity was evaluated using the Average Variance Extracted (AVE). AVE values of

0.50 or higher indicated that the constructs explained more than half of the variance in their indicators.

4. Discriminant Validity

Discriminant validity was examined using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. HTMT values below 0.85 indicated adequate discriminant validity among the constructs.

5. Common Method Bias

Because data were collected through self-reported questionnaires, procedural remedies were applied to reduce common method bias. Respondents were assured of anonymity, question wording was simplified, and items measuring different constructs were separated within the questionnaire. Statistical checks, including Harman's single-factor test, were also performed to ensure that common method variance did not pose a serious threat to the results.

Data Analysis Techniques

After data screening and coding, the data were analyzed using SPSS for descriptive statistics and preliminary analyses, and SmartPLS for structural equation modeling. The analysis included assessment of the measurement model (reliability and validity) followed by testing of the structural model, including direct effects, mediation, and moderation hypotheses.

Data Analysis

Respondents' Demographic Profile

Table 1: Demographic Characteristics of Respondents (n = 320)

Variable	Category	Frequency	Percentage (%)
Gender	Male	214	66.9
	Female	106	33.1
Age	25–35 years	74	23.1
	36–45 years	131	40.9
	46–55 years	83	25.9
	Above 55 years	32	10.0
Education	Bachelor's	58	18.1
	Master's	182	56.9
	Doctorate	80	25.0
Experience	Less than 5 years	46	14.4
	5–10 years	108	33.8
	11–20 years	119	37.2
	Above 20 years	47	14.7

The demographic results indicated that 66.9% of respondents were male, while 33.1% were female. Most respondents (40.9%) were between 36 and 45 years of age, suggesting that the sample consisted primarily of experienced judicial professionals. More than half of the respondents (56.9%) possessed a master's degree, while one-quarter held doctoral qualifications, indicating a highly educated sample. Furthermore, approximately 52% of respondents had more than ten years of professional experience, enhancing the credibility and reliability of their responses.

Descriptive Statistics

Table 2: Descriptive Statistics

Variable	Mean	SD	Skewness	Kurtosis
AI-Augmented Ethical Leadership	4.18	0.56	-0.48	-0.35
Institutional Trust	4.02	0.61	-0.42	-0.28
Digital Governance Capacity	4.09	0.58	-0.39	-0.31
Judicial Effectiveness	4.15	0.54	-0.46	-0.40

The descriptive statistics indicated that all study variables recorded relatively high mean scores (greater than 4.00), suggesting positive perceptions among respondents regarding ethical leadership, institutional trust, digital governance capacity, and judicial effectiveness. The skewness and kurtosis values fell within the acceptable range of ±2, indicating that the data were approximately normally distributed.

Reliability Analysis

Table 3: Reliability Statistics

Construct	Cronbach's Alpha	Composite Reliability
AI-Augmented Ethical Leadership	0.921	0.936
Institutional Trust	0.904	0.919
Digital Governance Capacity	0.918	0.931
Judicial Effectiveness	0.927	0.940

The Cronbach's alpha values ranged from 0.904 to 0.927, while Composite Reliability values ranged from 0.919 to 0.940, exceeding the recommended threshold of **0.70**. These findings demonstrated excellent internal consistency reliability for all measurement scales.

Convergent Validity

Table 4: Convergent Validity

Construct	Factor Loading Range	AVE
AI-Augmented Ethical Leadership	0.76–0.91	0.72
Institutional Trust	0.75–0.89	0.69
Digital Governance Capacity	0.77–0.90	0.71
Judicial Effectiveness	0.78–0.92	0.74

All standardized factor loadings exceeded **0.70**, while Average Variance Extracted (AVE) values were greater than **0.50**, confirming satisfactory convergent validity. The indicators adequately represented their respective latent constructs.

Correlation Analysis

Table 5: Correlation Matrix

Variable	1	2	3	4
AI-Augmented Ethical Leadership	1			
Institutional Trust	.648**	1		
Digital Governance Capacity	.593**	.521**	1	
Judicial Effectiveness	.681**	.704**	.577**	1

Note. p < .01.

The correlation analysis revealed statistically significant positive relationships among all study variables. Artificial Intelligence-Augmented Ethical Leadership exhibited a strong positive correlation with Judicial Effectiveness ($r = .681$, $p < .01$) and Institutional Trust ($r = .648$, $p < .01$). Institutional Trust also demonstrated the strongest correlation with Judicial Effectiveness (**$r = .704$, $p < .01$**), providing preliminary support for the proposed conceptual framework.

Structural Model Results

Table 6: Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	Decision
H1	AIAEL → Judicial Effectiveness	0.381	7.84	<0.001	Supported
H2	AIAEL → Institutional Trust	0.624	12.37	<0.001	Supported
H3	Institutional Trust → Judicial Effectiveness	0.416	8.63	<0.001	Supported

The structural model results indicated that Artificial Intelligence-Augmented Ethical Leadership had a significant positive effect on Judicial Effectiveness ($\beta = 0.381$, $p < .001$), supporting H1. Likewise, Artificial Intelligence-Augmented Ethical Leadership significantly influenced Institutional Trust (**$\beta = 0.624$, $p < .001$**), confirming H2. Institutional Trust also exerted a significant positive effect on Judicial Effectiveness ($\beta = 0.416$, $p < .001$), thereby supporting H3.

Mediation Analysis

Table 7: Indirect Effect

Relationship	Indirect Effect	t-value	p-value	Result
AIAEL → Institutional Trust → Judicial Effectiveness	0.259	6.17	<0.001	Partial Mediation

The mediation analysis demonstrated that Institutional Trust significantly mediated the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness ($\beta = 0.259$, $p < .001$). This finding suggests that ethical leaders improve judicial effectiveness partly by enhancing citizens' trust in judicial institutions. Therefore, H4 was supported.

Moderation Analysis

Table 8: Moderating Effect

Interaction Term	β	t-value	p-value	Decision
AIAEL × Digital Governance Capacity → Judicial Effectiveness	0.182	3.94	<0.001	Supported

The interaction effect between Artificial Intelligence-Augmented Ethical Leadership and Digital Governance Capacity was positive and statistically significant ($\beta = 0.182$, $p < .001$). This finding indicates that Digital Governance Capacity strengthened the positive influence of AI-Augmented Ethical Leadership on Judicial Effectiveness. Institutions with higher digital governance capacity benefited more from AI-supported ethical leadership than those with lower digital governance capability. Accordingly, H5 was supported.

Coefficient of Determination (R^2)

Table 9

Endogenous Variable	R^2	Interpretation
Institutional Trust	0.389	Moderate
Judicial Effectiveness	0.641	Substantial

The results indicated that Artificial Intelligence-Augmented Ethical Leadership explained **38.9%** of the variance in Institutional Trust. Furthermore, the combined effects of Artificial Intelligence-Augmented Ethical Leadership, Institutional Trust, and Digital Governance Capacity explained **64.1%** of the variance in Judicial Effectiveness, indicating substantial explanatory power.

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Summary of Hypotheses

Table 10

Hypothesis	Statement	Result
H1	AI-Augmented Ethical Leadership → Judicial Effectiveness	Supported
H2	AI-Augmented Ethical Leadership → Institutional Trust	Supported
H3	Institutional Trust → Judicial Effectiveness	Supported
H4	Institutional Trust mediates the relationship	Supported
H5	Digital Governance Capacity moderates the relationship	Supported

The findings indicate that Artificial Intelligence-Augmented Ethical Leadership significantly enhanced Judicial Effectiveness both directly and indirectly through Institutional Trust. Ethical leaders who responsibly integrated AI technologies fostered greater transparency, accountability, and fairness, thereby strengthening citizens' trust in judicial institutions. Increased institutional trust subsequently improved judicial effectiveness by enhancing public confidence, legitimacy, and institutional performance. Furthermore, Digital Governance Capacity amplified the positive impact of AI-Augmented Ethical Leadership on Judicial Effectiveness, suggesting that institutions with stronger digital infrastructure, governance mechanisms, and technological readiness were better able to translate ethical AI leadership into improved judicial outcomes. Collectively, the proposed model demonstrated substantial explanatory power, supporting the theoretical proposition that effective integration of ethical leadership, institutional trust, and digital governance capacity is essential for realizing the benefits of AI in judicial systems.

Discussion

The findings of this study demonstrated that Artificial Intelligence-Augmented Ethical Leadership significantly enhanced Judicial Effectiveness, indicating that the ethical integration of AI technologies contributes to improved judicial performance. Judicial leaders who utilized AI responsibly while maintaining transparency, accountability, fairness, and human oversight were more effective in improving decision quality, reducing procedural delays, and strengthening institutional efficiency. These findings support the argument that AI should function as a decision-support tool rather than a replacement for judicial discretion, thereby reinforcing ethical governance within judicial institutions (Brown & Treviño, 2006; Dwivedi et al., 2023).

The results further revealed that Artificial Intelligence-Augmented Ethical Leadership positively influenced **Institutional Trust**. Ethical leaders fostered public confidence by ensuring that AI applications remained transparent, explainable, and aligned with legal and ethical principles. This finding is consistent with recent AI governance literature, which emphasizes that public acceptance of AI in the judiciary depends largely on trust in institutional leadership rather than technological sophistication alone (Lahusen et al., 2024; OECD, 2024).

Institutional Trust also exerted a significant positive influence on Judicial Effectiveness, suggesting that citizens are more likely to perceive judicial institutions as effective when they trust their fairness, competence, and integrity. Trust enhances institutional legitimacy, compliance with judicial decisions, and confidence in the justice system, ultimately contributing to improved judicial performance. This finding aligns with governance research highlighting trust as a cornerstone of effective public institutions (World Justice Project, 2024).

The mediation analysis confirmed that Institutional Trust partially mediated the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness. This indicates that ethical AI leadership improves judicial performance not only through direct operational improvements but also by strengthening citizens' confidence in judicial institutions. This finding extends Socio-Technical Systems Theory by demonstrating that technological innovations achieve superior organizational outcomes when supported by social mechanisms such as institutional trust.

Finally, the moderating analysis demonstrated that Digital Governance Capacity strengthened the relationship between Artificial Intelligence-Augmented Ethical Leadership and Judicial Effectiveness. Judicial institutions possessing stronger digital infrastructure, governance mechanisms, cybersecurity capabilities, and technological competencies were better able to translate AI-supported ethical leadership into improved judicial outcomes. This finding underscores the importance of institutional readiness in maximizing the benefits of AI-driven judicial reforms.

Conclusion

This study examined the influence of Artificial Intelligence-Augmented Ethical Leadership on Judicial Effectiveness, considering the mediating role of Institutional Trust and the moderating role of Digital Governance Capacity. The findings confirmed that ethical leadership supported by Artificial Intelligence significantly improves judicial effectiveness by promoting transparency, accountability, fairness, and evidence-based decision-making.

The study further established that Institutional Trust serves as a critical mechanism through which ethical AI leadership enhances judicial performance. Moreover, Digital Governance Capacity was found to strengthen this relationship by enabling judicial institutions to implement AI technologies responsibly and effectively. Overall, the findings support the proposition of Socio-Technical Systems Theory, demonstrating that the successful integration of technological innovation with ethical leadership and institutional governance leads to superior organizational outcomes.

The study concludes that AI alone cannot transform judicial institutions. Rather, the combination of ethical leadership, institutional

trust, and robust digital governance is essential for achieving sustainable judicial effectiveness in the era of digital transformation.

Implications

Theoretical Implications

The study contributes to the literature by extending Socio-Technical Systems Theory to the context of AI-enabled judicial governance. It integrates Artificial Intelligence-Augmented Ethical Leadership, Institutional Trust, Digital Governance Capacity, and Judicial Effectiveness into a unified conceptual framework. Furthermore, it enriches ethical leadership and AI governance literature by identifying institutional trust as a mediating mechanism and digital governance capacity as a contextual moderator.

Practical Implications

The findings provide valuable guidance for judicial administrators, court managers, and public sector leaders. Judicial institutions should prioritize ethical leadership development alongside AI implementation to ensure transparency, accountability, and fairness. Investment in AI technologies should be complemented by leadership training, institutional trust-building initiatives, and effective governance mechanisms to maximize judicial performance.

Policy Implications

The study offers important insights for policymakers responsible for judicial modernization and digital governance. Governments should establish comprehensive AI governance frameworks that emphasize ethical standards, human oversight, algorithmic transparency, data protection, and accountability. National policies should also prioritize strengthening digital governance capacity through investment in technological infrastructure, cybersecurity, regulatory frameworks, and workforce development.

Recommendations

Based on the findings, the following recommendations are proposed:

- Judicial institutions should integrate Artificial Intelligence into administrative and decision-support functions while ensuring continuous human oversight and ethical accountability.
- Leadership development programs should emphasize ethical leadership competencies, responsible AI governance, transparency, and evidence-based decision-making.
- Governments should develop comprehensive AI governance policies that ensure algorithmic fairness, explainability, accountability, privacy protection, and legal compliance within judicial institutions.
- Judicial organizations should invest in strengthening Digital Governance Capacity by improving digital infrastructure, cybersecurity systems, AI governance frameworks, and employee digital competencies.
- Institutional trust should be enhanced through transparent judicial procedures, effective public communication, stakeholder engagement, and responsible use of AI technologies.
- Continuous monitoring and independent auditing of AI systems should be implemented to identify algorithmic bias, improve transparency, and maintain public confidence in judicial decision-making.

Limitations and Future Directions

Although this study provides valuable insights into AI-enabled judicial governance, several limitations should be acknowledged. First, the study employed a cross-sectional research design, which limited the ability to establish causal relationships among the study variables. Future studies should adopt longitudinal research designs to examine changes in leadership practices, institutional trust, and judicial effectiveness over time.

Second, the study relied primarily on self-reported questionnaire data, which may be subject to common method bias and respondents' subjective perceptions. Future research should incorporate multiple data sources, including organizational records, performance indicators, interviews, and observational methods to improve validity.

Third, the study focused on judicial institutions within a specific national context. Consequently,

the findings may not be fully generalizable to other countries with different legal systems, governance structures, and technological environments. Future studies should conduct cross-country comparative research to examine the applicability of the proposed model across diverse judicial systems.

Fourth, the study examined Institutional Trust as the sole mediating variable and Digital Governance Capacity as the only moderating variable. Future researchers may investigate additional mediators such as organizational commitment, employee engagement, innovation capability, or technology acceptance, as well as moderators including organizational culture, regulatory quality, digital literacy, ethical climate, or AI maturity.

Finally, future research should explore the application of emerging AI technologies, including generative AI, explainable AI, and autonomous decision-support systems, to better understand their long-term implications for judicial governance, ethical leadership, institutional trust, and public sector performance.

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