

Digital Leadership, Management Information Systems, and Higher Education Performance: The Mediating Role of Organizational Culture in Indonesian Private Universities

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Abstract

Digital transformation has increasingly reshaped the governance and operational systems of higher education institutions, encouraging universities to strengthen institutional adaptability through leadership capability, digital infrastructure, and supportive organizational environments. Despite extensive discussion regarding digital leadership and management information systems, limited empirical evidence explains how these factors collectively influence institutional performance, particularly through organizational culture within developing-country higher education contexts. This research explores the relationships among digital leadership, management information systems, organizational culture, and higher education performance in private universities under the coordination of LLDIKTI Region II, Indonesia. Data were obtained from 327 academic and managerial respondents representing 160 private universities and analyzed using Structural Equation Modeling (SEM) with LISREL. The analysis demonstrates that management information systems contribute positively to institutional performance, whereas digital leadership does not produce a direct performance effect. However, digital leadership substantially strengthens organizational culture, which subsequently emerges as the most influential factor affecting higher education performance. The findings further reveal that organizational culture fully transmits the effect of digital leadership on institutional performance and partially channels the influence of management information systems. These results suggest that institutional performance improvement in higher education is shaped not only by technological capability and leadership practices but also by the ability of organizations to cultivate adaptive cultural environments that support digital transformation. This study offers empirical support for an integrated framework connecting leadership, information systems, and organizational culture within higher education management.

Keywords: *Digital Leadership, Management Information Systems, Organizational Culture, Higher Education Performance, Digital Transformation, Structural Equation Modeling.*

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INTRODUCTION

The rapid expansion of digital technology has significantly altered how organizations operate, compete, and create value across various sectors, including higher education. Universities are increasingly confronted with demands for greater institutional adaptability, service quality, governance effectiveness, and long-term competitiveness within environments characterized by technological disruption and accelerating digitalization (Verhoef et al., 2021; Kraus et al., 2022). In response to these pressures, higher education institutions have intensified efforts to integrate digital systems into academic, managerial, and administrative activities as part of broader institutional transformation strategies (Benavides et al., 2020; Bond et al., 2020). Digital transformation within universities is therefore no longer limited to technological modernization, but has become closely associated with institutional sustainability, responsiveness, and organizational performance.

The growing influence of Industry 4.0, combined with increasing stakeholder expectations regarding educational quality and institutional efficiency, has further accelerated the adoption of digital practices within universities (Dwivedi et al., 2021; Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, 2021). Universities are expected to respond more rapidly to organizational change by developing flexible governance systems supported by digital infrastructure and integrated information management processes (Habib et al., 2021; Ramadania et al., 2024). However, technological implementation alone is often insufficient to ensure successful institutional transformation. Many higher education institutions continue to encounter difficulties in translating digital initiatives into sustainable organizational performance due to limitations related to leadership capability, organizational readiness, and institutional culture.

Leadership has become one of the central elements influencing the effectiveness of digital transformation in contemporary organizations. Within higher education institutions, leaders are increasingly required to manage technological adaptation, encourage innovation, facilitate organizational learning, and strengthen institutional responsiveness toward environmental change (Avolio et al., 2021; Klus & Müller, 2021). The ability of leaders to strategically utilize digital technologies influences not only operational decision-making but also organizational readiness in facing technological disruption and competitive pressures (Schallmo & Williams, 2020; El Sawy et al., 2021). Consequently, digital leadership has emerged as an important organizational capability that may determine whether digital transformation initiatives are able to generate meaningful institutional outcomes.

Existing empirical evidence indicates that digital leadership contributes to organizational improvement through several organizational dimensions, including innovation capability, employee engagement, organizational agility, and digital maturity (Hasanli, 2021; Van Chien et al., 2023; Bryde, 2023). In university settings, leadership that supports digital transformation has been associated with

improvements in institutional innovation, academic productivity, organizational sustainability, and learning effectiveness (AlAjmi, 2022; Gunawan & Rahman, 2023; Hajjaj et al., 2025). Nevertheless, prior studies have predominantly emphasized the direct relationship between digital leadership and organizational performance, while relatively limited attention has been devoted to understanding the internal organizational mechanisms through which leadership capability contributes to institutional effectiveness (Chatterjee et al., 2021; López-Figueroa et al., 2025).

Alongside leadership capability, Management Information Systems (MIS) also represent an important component of institutional digital transformation. The increasing dependence on digital information processing has encouraged universities to utilize integrated information systems to support governance quality, administrative coordination, academic services, and strategic decision-making processes (Laudon & Laudon, 2021; Stair & Reynolds, 2022). Through the availability of accurate and timely information, universities are expected to improve organizational efficiency, institutional transparency, and managerial effectiveness (Abu-Shanab & Al-Jamal, 2021; Chandio et al., 2020).

Previous studies have shown that information systems contribute substantially to organizational productivity, institutional effectiveness, and decision quality across various sectors (Ali et al., 2020; Chong et al., 2023). Within higher education institutions, integrated information systems assist universities in managing academic and administrative activities more efficiently while also supporting institutional planning and policy implementation (Al-Okaily et al., 2022; Nugroho et al., 2025). Despite these benefits, the effectiveness of information systems cannot be separated from organizational conditions in which technological systems are implemented. Institutional culture, organizational readiness, and employee adaptability often determine whether information systems are capable of generating optimal organizational outcomes (Bostrom & Heinen, 1977; DeLone & McLean, 2003).

Organizational culture therefore becomes an important factor in understanding the success of digital transformation within higher education institutions. Institutional transformation is strongly influenced by how organizational members collectively respond to innovation, collaboration, technological adaptation, and continuous learning processes (Schein & Schein, 2021; Cameron & Quinn, 2021). Universities characterized by adaptive organizational cultures are generally more capable of supporting innovation-oriented behavior, encouraging flexibility, and facilitating institutional change in digital environments (Duerr et al., 2018; Veiga et al., 2023).

Prior research consistently indicates that organizational culture contributes to stronger organizational effectiveness by improving coordination, strengthening institutional commitment, and supporting productive work environments (Denison, 1990; Kim & Chang, 2019; O'Reilly et al., 2020). Within higher education contexts, supportive cultural environments have also been associated with improved academic

innovation, service quality, and institutional performance (Susanto & Asmarani, 2023; Ribeiro et al., 2021). Furthermore, organizational culture has increasingly been viewed as a strategic mechanism connecting leadership practices and organizational outcomes (Ali et al., 2021; Philip & Edwin, 2021). Leaders who successfully foster adaptive and innovation-oriented institutional environments are generally more capable of achieving sustainable organizational performance (Kaur et al., 2023; Alshuhumi et al., 2025). Similarly, information systems are more likely to function effectively when technological implementation aligns with organizational values, institutional readiness, and employee behavior (Aissioui et al., 2021; Balqis et al., 2023).

Although studies concerning digital leadership, management information systems, organizational culture, and organizational performance continue to expand, several important issues remain insufficiently explored. Previous studies frequently examine digital leadership and information systems independently rather than integrating both constructs within a comprehensive analytical framework (Al-Qatawneh & Easa, 2020; Hidayat et al., 2023). In addition, empirical evidence regarding the interaction among digital leadership, information systems, and organizational culture within higher education institutions in developing countries remains relatively limited (Ratajczak, 2022; Khurniawan et al., 2024). Existing literature also provides limited explanation regarding how organizational culture mediates the influence of digital leadership and information systems on institutional performance outcomes (Ali et al., 2021; Puliwarna et al., 2023).

These issues are particularly relevant within Indonesian private universities, which currently face increasing pressure associated with institutional competition, resource limitations, quality assurance standards, and digital transformation demands (Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, 2023). Understanding how leadership capability and information systems contribute to organizational performance through organizational culture therefore becomes increasingly important for strengthening higher education governance and institutional sustainability.

Based on these considerations, this study investigates the influence of Digital Leadership and Management Information Systems on Higher Education Performance while examining the mediating role of Organizational Culture among private universities under the coordination of the Higher Education Service Institution (LLDIKTI) Region II in Indonesia. The study is expected to contribute to the literature on digital transformation and higher education management by empirically examining the interconnected relationships among leadership capability, information systems, organizational culture, and institutional performance within higher education institutions.

METHODS

Research Design

This research was designed within a quantitative explanatory framework to examine the interrelationships among digital leadership, management information systems, organizational culture, and higher education performance in private universities. The study combined descriptive and explanatory perspectives in order to capture both the current institutional conditions and the causal associations among the proposed research constructs. The descriptive component was used to provide an overview of the existing implementation of digital leadership practices, information systems utilization, organizational culture, and institutional performance within private higher education institutions. At the same time, the explanatory component was intended to evaluate the structural relationships among the variables included in the conceptual model. The investigation specifically analyzed the influence of Digital Leadership (DL) and Management Information Systems (MIS) on Higher Education Performance (HEP), with Organizational Culture (OC) functioning as an intervening variable. To evaluate the interconnected relationships among the latent constructs, Structural Equation Modeling (SEM) was applied as the primary analytical technique. The use of SEM allowed the study to simultaneously assess both direct and indirect relationships while accommodating the complexity of multiple latent variables within a single analytical framework. This analytical approach was considered suitable because the proposed model involved multidimensional constructs and mediating relationships requiring comprehensive statistical examination.

Population and Sample

This study involved private universities operating within the jurisdiction of the Higher Education Service Institution Region II (LLDIKTI II), comprising a total population of 160 institutions, encompassing South Sumatra, Lampung, Bengkulu, and the Bangka Belitung Islands provinces. The unit of analysis was the institution, with 327 respondents, including Rectors, Vice Rectors, Deans, Heads of Study Programs, Heads of Quality Assurance, and Heads of Information Technology, who are directly involved in institutional strategic decision-making. The researchers used a multi-informant approach to minimize single-informant bias. Respondents were selected purposively based on positions relevant to digital governance and quality assurance. Institutions included a purposive sampling strategy was applied to identify institutions that had actively implemented digital transformation initiatives and fulfilled the criteria relevant to the objectives of the study and management information systems.

Data Collection Procedures

The study gathered data by administering structured questionnaires to respondents representing the selected higher education institutions.

First, observations were conducted to examine digital leadership practices, management information system implementation, and organizational culture within participating institutions. Second, semi-structured interviews were carried out with university leaders and IT managers to gain contextual insights into institutional digital transformation initiatives. Primary quantitative information was obtained by distributing structured online questionnaires via Google Forms. Each questionnaire item was measured using a five-point Likert scale, with response options ranging from 1 (strongly disagree) to 5 (strongly agree).

Measurement of Constructs

Table 1. Research Constructs and Dimensions

Construct	Dimensions
Digital Leadership	Visionary Leadership, Digital Competence, Agility, Collaboration and Empowerment, Innovation and Change Management, Communication, Ethics and Responsibility
Management Information Systems	Technology, Organization, Human Resources, Data and Information, Decision-Making Process, Security and Ethics, System Performance
Organizational Culture	Innovation and Risk Taking, Attention to Detail, Outcome Orientation, People Orientation, Team Orientation, Aggressiveness, Stability
Higher Education Performance	Teaching and Learning Quality, Research and Publication Quality, Internationalization and Globalization, Social and Economic Contribution, Operational Efficiency and Governance

Data Analysis

The analysis process combined descriptive and inferential statistical techniques to obtain a comprehensive understanding of the research data. Descriptive analysis was first performed to summarize respondent profiles and identify general distribution tendencies across the investigated variables. Subsequently, inferential analysis was conducted using Structural Equation Modeling (SEM) to evaluate the adequacy of the measurement model and examine the causal relationships among the latent constructs included in the proposed framework.

The SEM procedure included:

1. Convergent validity assessment.
2. Discriminant validity assessment.
3. Reliability testing.
4. Structural model evaluation.
5. Hypothesis testing.
6. Mediation analysis.

Table 2. Research Hypotheses

Code	Hypothesis
H1	Digital Leadership positively influences Higher Education Performance
H2	Management Information Systems positively influence Higher Education Performance
H3	Digital Leadership positively influences Management Information Systems
H4	Digital Leadership positively influences Organizational Culture
H5	Management Information Systems positively influence Organizational Culture
H6	Organizational Culture positively influences Higher Education Performance
H7	Organizational Culture mediates the relationship between Digital Leadership and Higher Education Performance
H8	Organizational Culture mediates the relationship between Management Information Systems and Higher Education Performance

RESULTS AND DISCUSSION

Structural Model Evaluation

The structural model assessment was conducted to analyze the interrelationships among Digital Leadership, Management Information Systems, Organizational Culture, and Higher Education Performance. The analysis revealed that the coefficient of determination (R^2) for Organizational Culture reached 0.54, suggesting that Digital Leadership and Management Information Systems collectively accounted for 54% of the variation in Organizational Culture. In addition, the R^2 value for Higher Education Performance was recorded at 0.61, indicating that the antecedent constructs explained 61% of the variance in institutional performance. These results demonstrate that the proposed research model provides strong explanatory capability in capturing organizational phenomena within private higher education institutions. Referring to Hair et al. (2022), an R^2 value above 0.50 reflects a moderate to substantial level of predictive accuracy indicate moderate-to-strong predictive capability in organizational research. The following shows a complete image of the results of model testing using LISREL.

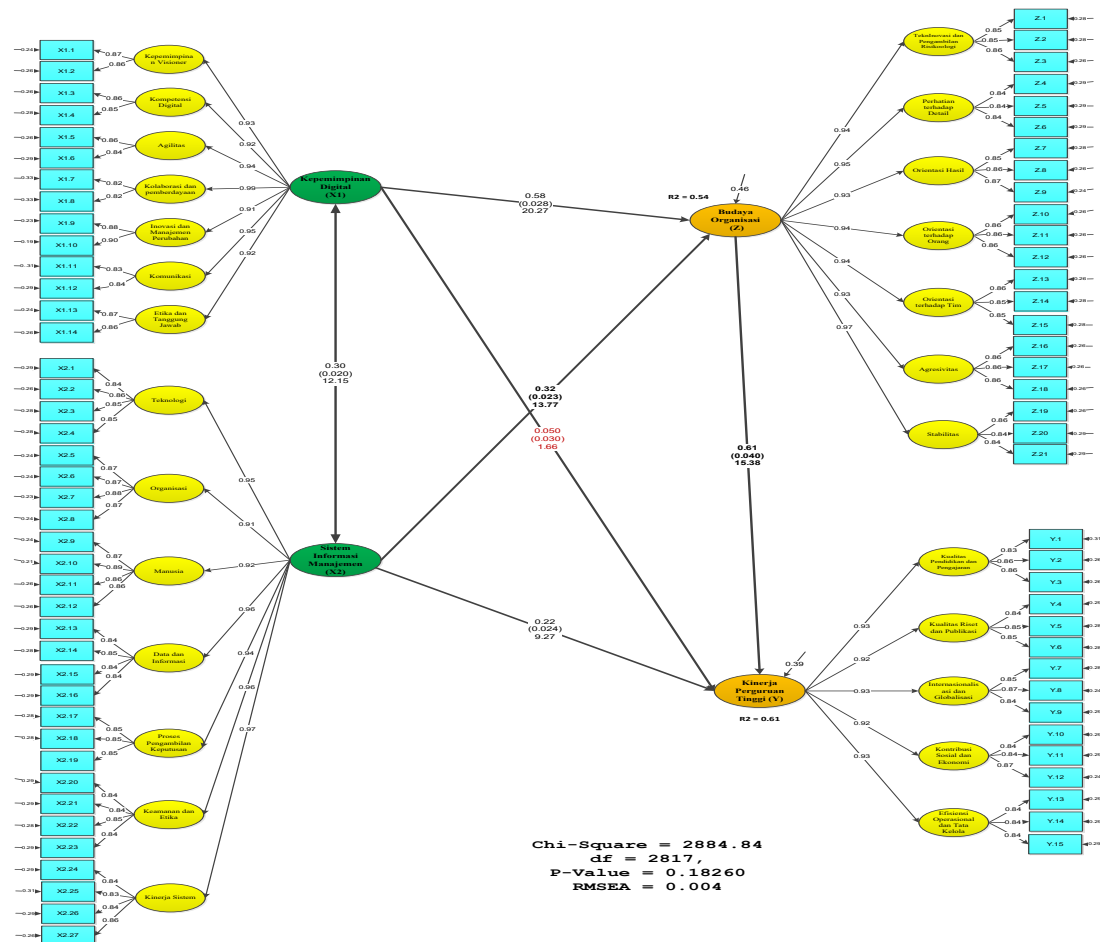


Figure 2. Structural Equation Modeling
Source: Data processed with LISREL (2026)

The structural equations obtained from the LISREL analysis are as follows:

Organizational Culture = 0.58 Digital Leadership + 0.32 Management Information Systems

Higher Education Performance = 0.05 Digital Leadership + 0.22 Management Information Systems + 0.61 Organizational Culture.

The results indicate among the variables examined in the structural model, organizational culture demonstrated the strongest contribution to higher education performance among all constructs examined.

Effect of Digital Leadership on Higher Education Performance

The statistical results indicate that Digital Leadership did not demonstrate a significant direct effect on Higher Education Performance ($\beta = 0.05$; $t = 1.660$; $p > 0.05$). Accordingly, Hypothesis 1 was not supported in this study. This result suggests that the presence of digitally competent leaders alone is insufficient to directly improve institutional performance. Although digital leaders are expected to demonstrate vision, innovation, agility, collaboration, and technological competence, these characteristics may require supporting organizational mechanisms before generating measurable institutional outcomes.

This finding supports previous studies indicating that digital leadership often influences performance indirectly through organizational transformation processes. According to Van Chien et al. (2023), digital leadership tends to enhance organizational performance indirectly by strengthening digital transformation practices within institutions. Similarly, Klus and Müller (2021) argued that digital leaders create value by fostering organizational readiness and adaptability rather than producing immediate performance outcomes. Within the context of Indonesian private universities, digital leadership may still be in a transitional phase where strategic initiatives have not yet fully translated into operational performance indicators.

Effect of Management Information Systems on Higher Education Performance

Management Information Systems were found to exert a positive and statistically significant influence on Higher Education Performance ($\beta = 0.22$; $t = 9.270$; $p < 0.001$), indicating support for Hypothesis 2. The results suggest that the effective implementation of information systems enhances institutional performance through improvements in managerial coordination, decision-making accuracy, operational efficiency, academic administration, and resource allocation processes. Within higher education institutions, integrated digital systems enable universities to manage organizational activities more systematically and responsively in increasingly dynamic academic environments. These findings align with the Information Systems Success Model developed by DeLone and McLean (2003), which emphasizes that organizational benefits are strongly associated with information quality, system reliability, and service effectiveness. The results also reinforce the argument presented by Al-Okaily et al. (2022), who identified information systems as an important driver of digital transformation success in higher education institutions. The increasing dependence on digital platforms, integrated academic systems, and institutional databases has positioned information systems as a strategic organizational capability that supports institutional effectiveness and long-term university performance, and integrated institutional databases has positioned information systems as an important strategic resource for universities aiming to strengthen organizational performance.

Effect of Digital Leadership on Organizational Culture

The empirical analysis indicates that Digital Leadership exerts a positive and statistically significant influence on Organizational Culture ($\beta = 0.58$; $t = 20.270$; $p < 0.001$). Accordingly, Hypothesis 3 was supported. These results suggest that leaders with strong digital capabilities play an important role in fostering organizational values, behavioral norms, and institutional practices that encourage innovation and support digital transformation initiatives. Leadership practices that emphasize collaboration, technological adaptation, experimentation, and

continuous learning contribute substantially to the establishment of a digitally oriented organizational culture.

The results correspond with the study of Chatterjee et al. (2021), which highlighted the role of digital leadership in fostering adaptive organizational cultures and strengthening digital capability within organizations. Similar evidence was presented by Gfrerer et al. (2023), who described digital leadership as a key driver of organizational cultural change during digital transformation processes within organizations undergoing digitalization. The large coefficient obtained in this study indicates that leadership remains a dominant force in creating organizational environments that support technological change.

Effect of Management Information Systems on Organizational Culture

Management Information Systems significantly influence Organizational Culture ($\beta = 0.32$; $t = 13.770$; $p < 0.001$). Therefore, Hypothesis 4 is supported. The implementation of integrated information systems encourages transparency, collaboration, knowledge sharing, and data-driven decision-making practices. These practices gradually shape organizational values and behavioral norms. The finding supports the argument of Laudon and Laudon (2021) that information systems are not merely technological infrastructures but also mechanisms that facilitate organizational change. Likewise, Veiga et al. (2023) emphasized that digital technologies significantly contribute to the formation of a modern organizational culture within higher education institutions. Consequently, universities that invest in robust information systems are more likely to cultivate adaptive and innovation-oriented organizational cultures.

Effect of Organizational Culture on Higher Education Performance

The statistical evaluation demonstrates that Organizational Culture has a positive and highly significant effect on Higher Education Performance ($\beta = 0.61$; $t = 15.380$; $p < 0.001$). Thus, Hypothesis 5 was supported. Among all direct relationships examined in the structural model, the influence of Organizational Culture on Higher Education Performance showed the greatest effect magnitude, indicating that organizational culture is the primary determinant of institutional performance. A strong organizational culture promotes commitment, collaboration, innovation, and alignment with institutional goals. These factors collectively contribute to improvements in academic quality, operational effectiveness, and stakeholder satisfaction. The result supports Schein and Schein (2021), these findings support the argument that organizational culture constitutes a fundamental element in achieving organizational effectiveness. The results also reinforce the studies conducted by Denison (1990) and Ali et al. (2021), which reported that a strong organizational culture contributes substantially to improved organizational performance across various institutional sectors. For higher education institutions facing increasing competition

and digital disruption, culture becomes a strategic resource that sustains institutional excellence.

Mediating Role of Organizational Culture

The mediation assessment reveals that Organizational Culture serves as an important mechanism connecting Digital Leadership with Higher Education Performance. The indirect relationship produced a coefficient value of 0.354 and a Sobel test result of 12.281 ($p < 0.001$). The absence of a significant direct effect between Digital Leadership and institutional performance indicates that the contribution of leadership capability becomes meaningful only when leadership practices are able to cultivate adaptive organizational values, collaborative work environments, and openness toward technological change. In other words, the influence of Digital Leadership on institutional outcomes operates primarily through the development of Organizational Culture rather than through direct organizational intervention. This finding suggests that digital leadership contributes to institutional improvement by cultivating organizational environments that encourage innovation, collaboration, adaptability, and technological acceptance. The results are consistent with the Resource-Based View proposed by Barney (1991), which emphasizes that intangible organizational resources, including culture, are capable of converting leadership capabilities into sustainable competitive and performance advantages.

The relationship between Management Information Systems and Higher Education Performance was also transmitted through Organizational Culture, indicating the important role of institutional culture in translating technological capability into organizational outcomes. The indirect effect reached 0.195, accompanied by a Sobel test value of 10.278 ($p < 0.001$). This outcome reflects partial mediation, indicating that Management Information Systems influence institutional performance both directly and indirectly through Organizational Culture. Beyond improving operational efficiency and information processing, information systems also contribute to shaping organizational values, institutional behavior, and work practices that support organizational effectiveness. Overall, these findings confirm the results further imply that the contribution of Digital Leadership and Management Information Systems to institutional performance largely depends on the ability of organizations to cultivate supportive cultural environments contribute to performance enhancement within higher education institutions.

Discussion of Theoretical Contributions

The study provides additional empirical insight into higher education digital transformation by highlighting the importance of Organizational Culture in connecting leadership capability and information systems with institutional performance outcomes. The findings broaden the perspective of digital leadership research by indicating that leadership effectiveness within higher education institutions is achieved largely through the development of adaptive

organizational cultures rather than through direct performance effects alone. Furthermore, the study strengthens information systems literature by demonstrating that technological investments are more likely to generate organizational benefits when supported by conducive cultural conditions. Overall, the results provide empirical support for the argument that effective digital transformation in higher education institutions depends on the strategic alignment of leadership capability, technological infrastructure, and organizational culture.

CONCLUSION

Digital transformation within higher education institutions requires more than technological investment, as organizational effectiveness is also shaped by leadership capability and institutional culture. The study demonstrates that Management Information Systems contribute directly to higher education performance by strengthening operational efficiency, governance quality, and institutional decision-making processes. In contrast, Digital Leadership does not directly improve institutional performance, indicating that leadership capability alone is insufficient to generate measurable organizational outcomes without supportive internal mechanisms. The results show that Digital Leadership exerts a substantial influence on Organizational Culture, which subsequently becomes the strongest determinant of higher education performance. These findings highlight the importance of adaptive organizational environments that encourage collaboration, innovation, technological readiness, and continuous learning within universities undergoing digital transformation. The mediation analysis further confirms that Organizational Culture fully transmits the influence of Digital Leadership on institutional performance and partially mediates the relationship between Management Information Systems and Higher Education Performance. This condition suggests that organizational culture functions as a strategic organizational resource capable of transforming leadership capability and technological infrastructure into sustainable institutional outcomes. Universities characterized by supportive cultural environments are more likely to achieve stronger organizational adaptability, institutional effectiveness, and long-term competitiveness in increasingly digital academic environments. The study also provides empirical evidence supporting the integration of digital leadership, information systems, and organizational culture within a unified higher education management framework. From a practical perspective, university leaders should prioritize the development of adaptive organizational cultures alongside investments in digital infrastructure and information systems implementation. Strengthening institutional culture may therefore become an essential strategy for improving organizational performance and sustaining digital transformation initiatives within higher education institutions

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