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Digital transformation model for higher education governance: an integration of business processes, human resources, and technology

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ABSTRACT

Digital transformation has become a strategic priority for higher education institutions to improve governance efficiency, service quality, and adaptability in a rapidly evolving digital environment. However, many universities still face challenges due to fragmented administrative processes, limited system integration, and insufficient organizational readiness. This study examines how digital transformation reshapes governance processes through the integration of business processes, human resources, and technological systems. Using a qualitative case study approach, data were collected through semi-structured interviews with six key informants in university management, including the rector, vice rector, IT manager, and academic staff. Data were analyzed using the Gioia methodology to identify emerging patterns. The findings reveal three key dimensions driving digital transformation: business process modernization, organizational and human resource adaptation, and technology integration. Business process modernization enhances efficiency through standardized digital workflows. Organizational and human resource adaptation supports the development of digital competencies and new work practices. Technology integration improves effectiveness through centralized data management, better coordination, and data-driven decision-making. This study proposes a conceptual model showing how these dimensions interact to strengthen digital governance. It highlights that successful digital transformation depends not only on technology adoption but also on the alignment of organizational processes, human capabilities, and technological infrastructure.

Keywords: digital transformation; business process modernization; higher education governance; technology integration; organizational adaptation.

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1. INTRODUCTION

Rapid Advance in digital technology have significantly reshaped organizational operations across various sectors. Organizations are increasingly integrating digital technologies to enhance efficiency, improve service quality, and strengthen their strategic competitiveness through digital transformation. This shift has positioned digital transformation as a strategic priority for many organizations seeking to remain adaptive and responsive in an increasingly dynamic environment. Digital transformation refers to a fundamental organizational change driven by the integration of digital technologies into business processes, organizational structures, and managerial strategies. This transformation does not merely involve the adoption of new technologies but also requires the reconstruction of organizational capabilities, work processes, and governance mechanisms to create new forms of value and sustain competitiveness in the digital era (Carmo et al., 2025; José et al., 2025). From a theoretical perspective, digital transformation represents a profound organizational change in which digital technologies trigger significant shifts in value creation mechanisms, organizational structures, and strategic orientations (Vial, 2019).

In the higher education sector, digital transformation has become increasingly important as universities face growing pressure to modernize their governance systems and respond to rapidly changing social and technological environments. The growing adoption of technologies such as cloud computing, artificial intelligence, big data, and digital platforms enables universities to automate administrative processes, improve decision-making quality, and strengthen institutional performance (Carmo et al., 2025). At the same time, the digitalization of university governance in many countries has become necessary to address increasingly complex environmental demands, including the need for faster academic services, managerial transparency, and integrated institutional information systems (Duan et al., 2025; José et al., 2025). These technological developments are transforming how higher education institutions manage academic services, administrative workflows, and organizational coordination. Consequently, digital transformation is increasingly viewed as a crucial mechanism for improving efficiency, transparency, and responsiveness in higher education governance.

The growing digitalization of higher education institutions has attracted increasing academic attention in recent years. A systematic review conducted by Castro et al., (2020) indicates that digital transformation in higher education is an emerging research field influenced by broader technological developments associated with the Fourth Industrial Revolution. However, the review also reveals that much of the existing research remains fragmented and often fails to provide a comprehensive perspective that integrates technological, organizational, and managerial dimensions. Similarly, Singun, (2025) found that although digital transformation offers substantial benefits for higher education institutions, many institutions still feel unprepared to fully adapt due to various barriers. Studies on digital governance likewise emphasize that the success of digital transformation does not depend solely on technological provision. Organizational transformation including business process reengineering, adaptation of organizational culture, and the development of digital competencies among human resources plays an equally important role in determining the effectiveness of digital initiatives (Tapia et al., 2023).

From an organizational perspective, digital transformation should be understood as a strategic process that involves the redesign of business processes, organizational capabilities, and value-creation mechanisms. Digital technologies can generate strategic value only when they are effectively integrated with organizational structures and managerial practices. Without such integration, technology adoption may fail to produce meaningful organizational change or significant performance improvements (Carmo et al., 2025). In practice, slow, manual, and fragmented administrative processes remain common in many institutions, continuing to hinder organizational performance, increase administrative burdens, and reduce service quality (Yakubu et al., 2020). Therefore, digital governance holds substantial potential to enhance organizational efficiency, data accuracy, inter-unit coordination, and institutional capacity to adapt to environmental changes (Tambingon & Tangkere, 2025).

Despite the growing body of literature on digital transformation in higher education, several important research gaps remain unresolved. First, most existing studies still focus primarily on technology

adoption, digital infrastructure, or information system implementation. Although these studies provide valuable insights into the technological dimension of digitalization, they remain limited in explaining how digital transformation reshapes organizational workflows and governance processes within higher education institutions (Pamplona et al., 2024). In particular, the roles of workflow modernization, business process integration, and inter-unit coordination remain relatively underexplored within the context of digital governance. Second, there is a significant implementation gap between the theoretical conception of digital transformation and its realization in many higher education institutions. Although universities increasingly adopt digital platforms and information systems, administrative processes often remain fragmented, manual, and poorly integrated. As a result, digital initiatives frequently fail to achieve the expected efficiency improvements and may even create new forms of organizational complexity (Amaral et al., 2020; Bisri et al., 2024). This condition indicates that digital transformation should not be viewed merely as a technological issue but must also be analyzed from the perspective of organizational processes and governance structures. Third, the organizational dynamics involved in digital transformation within university governance remain insufficiently examined. Existing studies rarely explore how institutional actors experience, adapt to, and negotiate the changes introduced by digital governance systems at the level of organizational processes (Mavunda, 2025). Without an understanding of these organizational dynamics, digital transformation initiatives risk becoming superficial administrative reforms that merely introduce new technologies without fundamentally improving governance effectiveness or institutional coordination (Kuzminska et al., 2023). Overall, these gaps highlight the need for a more comprehensive understanding of digital transformation that integrates technological systems with organizational workflows and governance processes in higher education institutions.

To address these issues, this study examines how digital transformation reshapes governance processes in higher education institutions by focusing on the integration of business processes, human resources, and technological systems. Drawing on the theoretical perspective of digital transformation and organizational change proposed by Vial (2019), this research analyzes how business process reengineering, organizational adaptation, and technological integration interact in enhancing governance performance. Specifically, the study examines key components of digital transformation, including inter-unit coordination, data transparency, system integration, and changes in organizational work culture. By employing a process-based analytical framework, this research provides a more comprehensive understanding of how workflow modernization strategies can strengthen digital governance and improve institutional efficiency.

This study contributes to the growing discourse on digital transformation in higher education governance in several ways. Theoretically, it provides new insights into the critical role of workflow modernization in achieving effective governance in the digital era. While previous studies have largely emphasized technology adoption, this research highlights the importance of integrating technology, business processes, and organizational dynamics to produce meaningful governance transformation (Filho et al., 2023). Practically, the findings offer important implications for university leaders, policymakers, and technology practitioners. Institutional leaders can utilize these findings to design more comprehensive digitalization strategies that focus not only on technological adoption but also on the redesign of organizational processes. Policymakers may also use these insights to develop digital transformation policies that are better aligned with institutional needs and implementation challenges. Furthermore, system developers and management practitioners can gain deeper insights into how information systems can be designed to align with organizational workflows and governance processes, thereby improving system integration, data consistency, and service quality.

2. METHODOLOGY

2.1. Research Design

This study adopts a qualitative approach using a case study design to examine the phenomenon of digital transformation in the context of higher education governance. A case study design was chosen because it allows researchers to investigate contemporary phenomena in depth within real-life contexts,

particularly when the boundaries between the phenomenon and its context are not clearly distinguishable (Thoha & Mujahidin, 2023; Yin, 2018). The qualitative approach enables a comprehensive understanding of the dynamics surrounding the implementation of digital transformation as well as the experiences of organizational actors involved in the process. This approach allows the research questions to be explored inductively and supports the development of conceptual insights grounded in empirical data obtained from the field (Eisenhardt, 1989).

2.2. Research Context

This research was conducted at a higher education institution located in Bojonegoro, East Java, Indonesia, which is currently undergoing a process of digital transformation in its academic governance system and institutional services. In the context of higher education, digital transformation encompasses various aspects, including the digitalization of academic services, the management of institutional information systems, and the integration of technology into administrative and teaching processes. The selection of this institutional context was motivated by the increasing demand for digitalization in the management of educational organizations. Universities today are required to adopt digital technologies in order to enhance operational efficiency, improve the quality of academic services, and strengthen institutional competitiveness in an era characterized by rapid digital transformation.

2.3. Data Collection

Research data were collected through semi-structured interviews with key informants who hold strategic roles in institutional management and the implementation of digital transformation. Informants were selected using purposive sampling, which involves identifying participants who possess relevant knowledge and experience related to the phenomenon under investigation. A total of six informants participated in this study, including the rector, the vice rector for general affairs and resources, the head of the information technology unit, the head of the integrated service unit, and two faculty members. These informants were selected due to their direct involvement in decision-making processes, information technology management, and the implementation of digital systems within the institution.

In case study research, the use of multiple sources of evidence is essential for achieving a comprehensive understanding of the research phenomenon (Thoha & Mujahidin, 2023; Yin, 2018). Therefore, in addition to interviews, this study also utilized institutional documents and relevant organizational records to support the analytical process. The data collection process was conducted in several stages. The research team first submitted formal requests to potential informants inviting them to participate in the study. After obtaining their consent, interview schedules were arranged according to the availability of each informant. The interviews were conducted in depth to explore the informants' perceptions, experiences, and perspectives regarding the implementation of digital transformation within the institution.

2.4. Data Analysis

Data analysis in this study followed a grounded theory approach aimed at developing conceptual understanding based on empirical data obtained from the field. This approach enables researchers to identify patterns, categories, and conceptual relationships emerging from the data in a systematic manner (Niasse, 2023; Shrestha, 2025). The analytical process followed the coding procedures proposed by Gioia et al., (2012) the first stage involved open coding, which consisted of identifying phenomena emerging from the interview data and assigning labels to relevant concepts. The second stage was axial coding, in which relationships between categories and subcategories identified in the previous stage were examined. At this stage, the researcher analyzed how these categories were interconnected in explaining the research phenomenon. The third stage was selective coding, which involved integrating the identified categories into a core category representing the central phenomenon of the study (Thoha & Mujahidin, 2023). This process enabled the development of a conceptual structure that explains the dynamics of digital transformation implementation in the context of higher education organizations. The analysis was conducted iteratively through several coding cycles until a stable conceptual structure was achieved. When

additional analysis no longer generated new concepts, the study was considered to have reached theoretical saturation.

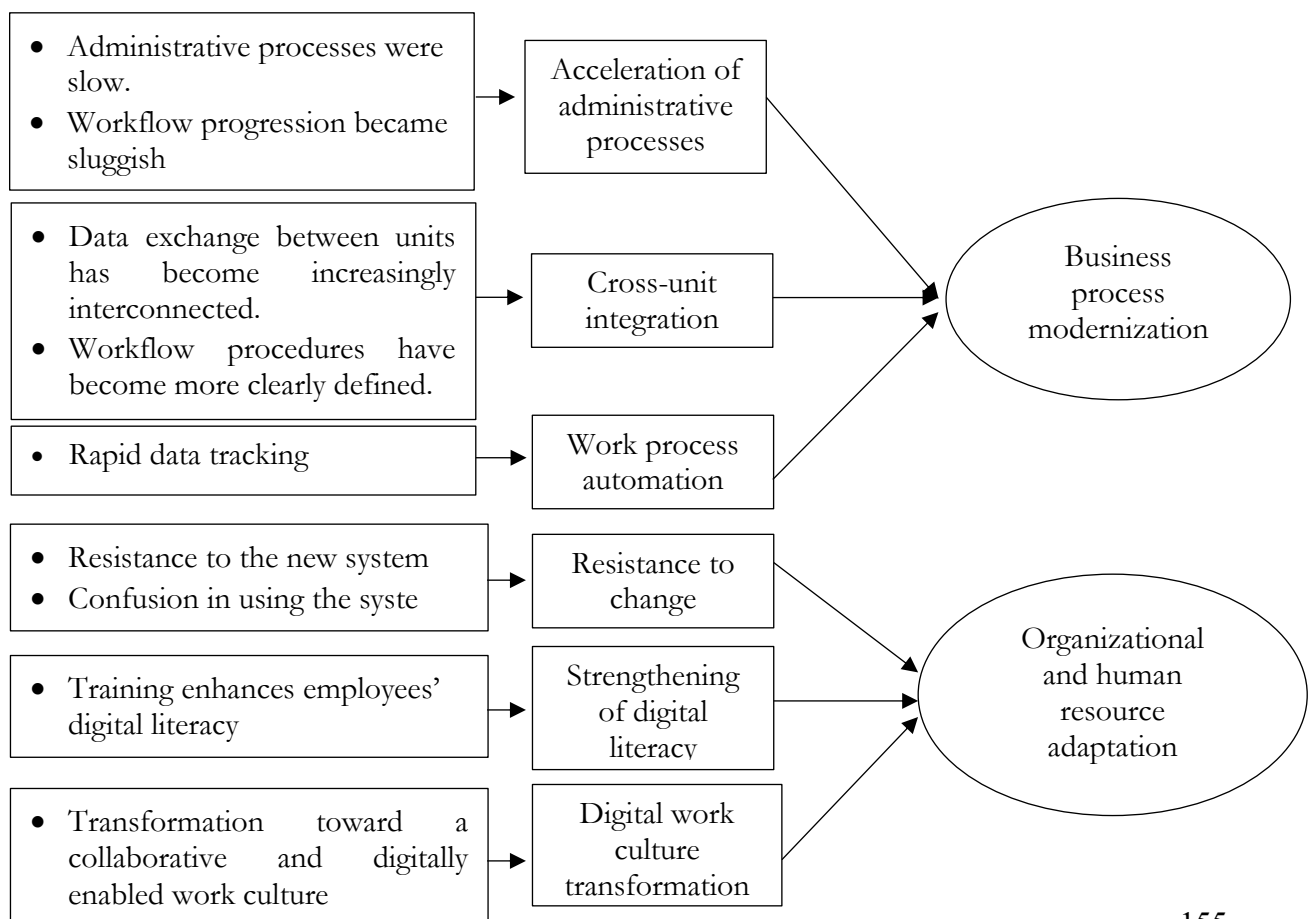
2.5. Trustworthiness of Data

To ensure the quality and validity of the research findings, several strategies were employed to enhance the trustworthiness of the data. The criterion of credibility was used to assess the extent to which the research findings accurately reflect the actual conditions in the field (Becket & Brookes, 2008). First, this study employed data triangulation, which involves using multiple sources of information to strengthen the validity of the research findings. The data sources included interviews with key informants as well as relevant organizational documents. Second, the analytical process was conducted systematically and thoroughly documented to ensure transparency in the research process. This documentation allows researchers to trace the analytical steps undertaken throughout the study. Third, the interpretation of the findings was carried out carefully by taking into account the organizational context as well as the perspectives of the informants involved in the study.

3. RESULT AND DISCUSSION

3.1. Result

The findings indicate that digital transformation in university governance is not merely associated with the adoption of new technologies, but also involves fundamental changes in organizational processes, human resource work patterns, and the integration of information systems to support institutional effectiveness. Such transformation emerges through three interrelated dimensions: the modernization of business processes, organizational and human resource adaptation, and the integration of technology to enhance organizational effectiveness. These three dimensions were identified through the processes of open coding, axial coding, and selective coding using the Gioia methodology, which aims to uncover conceptual patterns emerging from empirical data. The systematic mapping of these themes is presented in Figure 1



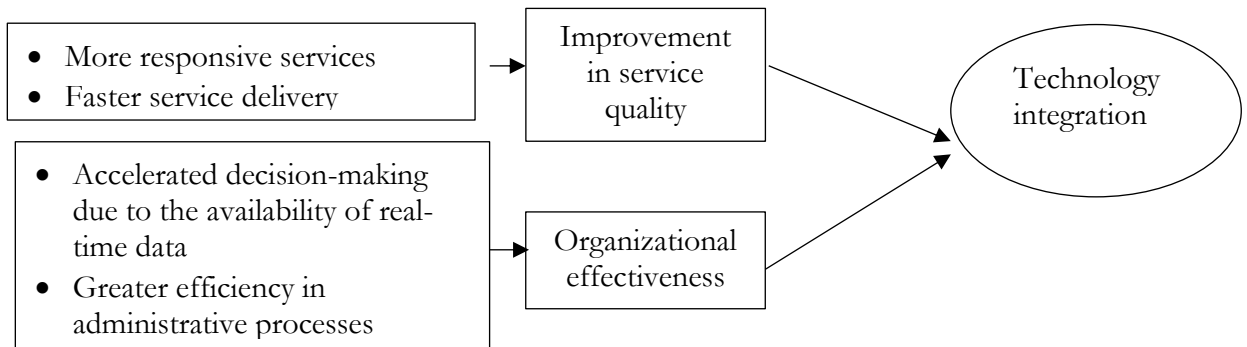


Figure 1 Gioia Data Structure

Source: Researcher, 2025.

3.2. Business Process Modernization

The findings indicate that business process modernization constitutes a fundamental component of digital transformation in universities. Digitalization does not merely transfer administrative activities into online systems; rather, it reconstructs workflows to become more efficient, transparent, and integrated. The implementation of digital systems enables the automation of various academic and administrative procedures, thereby reducing data duplication, accelerating service processes, and improving coordination across organizational units. One informant explained: *“In the past, the process was manual and slow, but now the new system has made workflows clearer, more standardized, and interconnected across units.”* (Informant 3).

These findings suggest that digitalization functions as an instrument for business process reengineering in university governance. Traditional business processes that tend to be bureaucratic and inefficient can be restructured through the utilization of digital technologies, resulting in more adaptive organizational systems. Previous studies have shown that business process modernization is one of the key prerequisites for successful digital transformation in both public sector organizations and higher education institutions (Bharadwaj et al., 2013; Vial, 2019)

3.3. Organizational and Human Resource Adaptation

Digital transformation also requires organizational adaptation and the enhancement of human resource capacity. During the early stages of digital system implementation, resistance to change emerged due to established work habits and limited technological competence among staff and faculty members. However, through training programs, policy socialization, and institutional leadership support, human resources gradually adapted to the new work systems. As expressed by the research informants: *“At the beginning of the digital transformation, many people resisted because they were confused and had to readjust to the new system.”* (Informant 1) and *“Now, after training and socialization programs, we have started to adapt, and our working patterns have become more collaborative.”* (Informant 2).

These findings indicate that the success of digital transformation is not determined solely by technological readiness but also by organizational preparedness and individual competencies in adopting new systems. Previous research emphasizes that changes in work culture, the development of digital literacy, and the strengthening of human resource capabilities are essential factors supporting successful digital transformation in modern organizations (Henriette et al., 2016; Kane et al., 2015)

3.4. Technology Integration for Organizational Effectiveness

The third dimension emerging from the findings is technology integration, which contributes to enhancing organizational effectiveness. The integration of digital systems enables universities to manage data in a centralized and real-time manner, thereby supporting faster and more data-driven decision-

making processes. Moreover, technology integration improves the quality of academic and administrative services provided to students. One informant stated: “Tracking and finding data is now much faster because the system connects everything.” (Informant 4) and “Services have become much faster now because the data are already synchronized.” (Informant 5).

Technology integration in university governance enables more effective cross-unit coordination and enhances the responsiveness of institutional services. Previous studies suggest that the integration of organizational information systems can improve operational efficiency and strengthen institutional capacity to utilize data as a basis for strategic decision-making (Tilson et al., 2010; Vial, 2019).

Overall, the findings of this study indicate that digital transformation in higher education governance represents a comprehensive organizational change process involving business process modernization, organizational and human resource adaptation, and technology integration. The conceptual framework derived from the findings illustrates that digital transformation in university governance operates through an interconnected process among the three dimensions identified in this study. Business process modernization serves as the initial driver that restructures traditional administrative and academic workflows into more efficient and standardized digital processes. This transformation subsequently requires organizational and human resource adaptation, as staff and faculty members must adjust their work practices, develop digital competencies, and adopt more collaborative ways of working. As these organizational adjustments take place, institutions become better positioned to achieve technology integration, where digital systems are interconnected and data flows seamlessly across units. The integration of technology ultimately enhances organizational effectiveness by enabling faster information access, improving coordination, and supporting data-driven decision-making within the university. The dynamic relationship among these dimensions suggests that digital transformation is not a linear technological upgrade but rather a comprehensive organizational change process in which technological innovation, human capability, and institutional structures evolve simultaneously. The conceptual relationship among these three dimensions contributing to organizational effectiveness is illustrated in Figure 2.

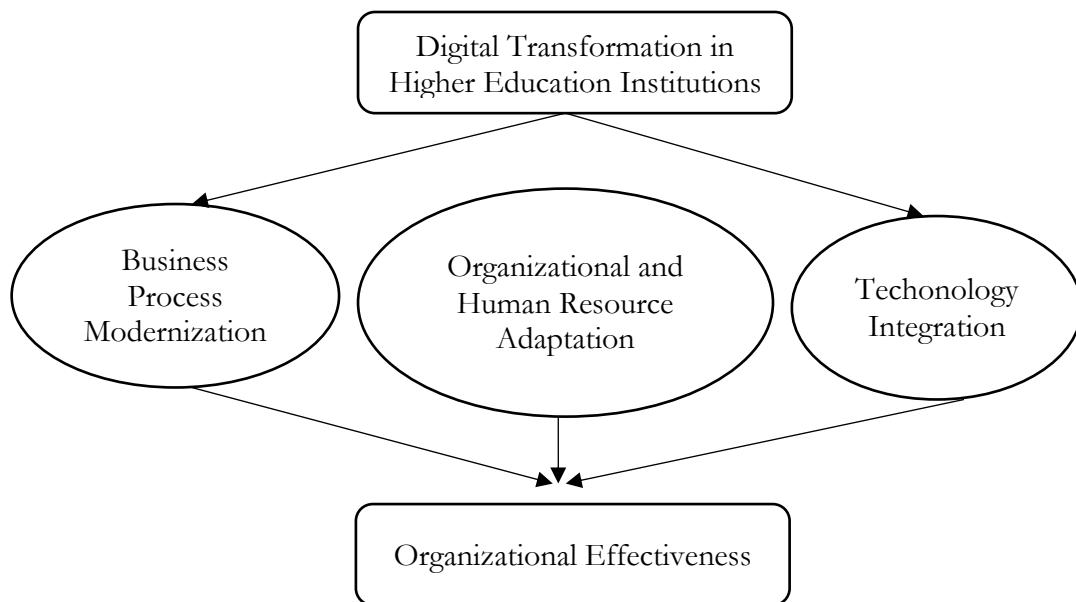


Figure 2 Conceptual Model of Digital Transformation in Higher Education Institutions

Source: Researcher, 2025.

3.5. Discussion

The findings of this study indicate that business process modernization, together with organizational and human resource adaptation, constitutes a key driver of successful digital transformation in higher education institutions. From a theoretical perspective, these results suggest that digital transformation should not be understood merely as the adoption of new technologies, but rather as a broader organizational change process involving the restructuring of work processes, the enhancement of human capabilities, and the integration of technological systems to support institutional effectiveness. Business process modernization enables organizations to transform manual workflows into more standardized, transparent, and data-driven systems, thereby improving operational efficiency and accelerating decision-making processes. In this context, digital technologies function not only as administrative tools but also as strategic infrastructures that facilitate information management and organizational coordination more effectively. These findings are consistent with the perspective of [Bharadwaj et al., \(2013\)](#), who argue that digital transformation requires fundamental changes in business processes in order for technology to generate strategic value for organizations. Business process modernization facilitates the integration of information systems, the automation of administrative activities, and greater transparency in organizational workflows. In the context of higher education, where organizational structures are often complex and involve multiple academic and administrative units, business process modernization becomes a critical foundation enabling digital technologies to produce tangible impacts on organizational effectiveness. Recent research further suggests that university digitalization requires the alignment of technological strategy, organizational governance, and changes in work culture in order to generate meaningful institutional transformation ([Fernandes & Singh, 2022](#)).

In addition, the findings highlight that organizational and human resource adaptation plays a crucial role in strengthening technology integration. Individuals with adequate digital literacy and organizations that support change are more capable of leveraging technology effectively. These results support the digital transformation framework proposed by [Vial \(2019\)](#), which conceptualizes digital transformation as a multidimensional process involving simultaneous changes in technology, organizational processes, and work practices. Within higher education institutions, the development of digital competencies among academic staff and administrative personnel becomes a key factor enabling institutions to effectively utilize technology in both academic and managerial activities. Recent studies further emphasize that digital literacy and organizational readiness are critical determinants of successful digital transformation in universities, as the adaptive capacity of human resources determines the extent to which technology can be effectively implemented within complex academic environments ([Farias-Gaytan et al., 2025](#)). Furthermore, this study reveals an organizational mechanism explaining how business process modernization and human resource adaptation reinforce technology integration. When organizational workflows are simplified and standardized, digital technologies can be integrated more effectively across various operational activities. At the same time, improvements in human resource capacity enable individuals within the organization to utilize technology for data management, cross-unit coordination, and information-based decision-making. The interaction between process transformation and human capability development creates conditions that allow digital transformation to generate tangible organizational value. This mechanism aligns with the argument of ([Mexhuani, 2025](#)), who suggests that failures in digital transformation are often caused more by limited organizational adaptability and human resource capability than by technological constraints. Other studies similarly indicate that the integration of digital systems can enhance operational efficiency and support data-driven decision-making in the management of higher education institutions ([Lyulyov et al., 2024](#)).

The findings are also consistent with higher education research highlighting that institutional digitalization depends not only on technology but also on organizational readiness and cultural change. Research by ([McKenna, 2021](#)) suggests that the transformation of higher education institutions requires structural and cultural changes that enable technology to be embedded within university governance. Similarly, studies [Antonopoulou et al., \(2023\)](#) emphasize that the success of digital innovation in universities is strongly influenced by organizational capacity to manage institutional change and develop human resource capabilities. Recent research also indicates that universities that successfully implement

digital transformation typically combine technological strategies with organizational process reforms and the development of digital competencies among academic staff (Cyfert et al., 2025).

Nevertheless, these findings should be interpreted within certain boundary conditions. First, the dynamics of digital transformation in higher education differ from those in industrial or business sectors. Universities often operate within relatively bureaucratic organizational structures, complex academic governance systems, and collegial decision-making processes, which may influence the speed and scope of digital transformation initiatives. Second, although this study highlights the importance of business process modernization and human resource adaptation, other factors such as strategic leadership, technological infrastructure, and institutional policy support may also influence the success of digital transformation. Recent research suggests that organizational barriers, including resistance to change and technological capacity limitations, often represent major challenges in the implementation of digitalization within higher education institutions (Singun, 2025). Beyond organizational implications, the findings of this study also relate to broader social issues, particularly those concerning the quality of educational governance and access to public services in the digital era. Digital transformation in higher education institutions not only enhances internal organizational efficiency but also has the potential to improve the quality of educational services provided to students and society more broadly. Business process modernization and digital system integration enable universities to deliver academic services that are more transparent, responsive, and accessible. This, in turn, may contribute to improved institutional governance and greater public accountability in higher education management.

Moreover, digital transformation also carries implications for the issue of the digital divide within the education sector. Institutions capable of effectively integrating technology can expand access to digital education services, including online learning systems, electronic administrative services, and real-time access to academic information. However, the benefits of digital transformation are not always distributed equally, particularly when technological infrastructure is limited or when digital literacy levels among faculty members and students remain low. Therefore, policies supporting digital literacy development, the strengthening of educational technology infrastructure, and the enhancement of human resource capacity are essential to ensure that digital transformation contributes to more inclusive educational access. These findings resonate with the perspective of Marginson (2008), who emphasizes that transformations in higher education systems must consider issues of equitable access and broader social impact.

Conceptually, this study contributes to the literature by demonstrating that digital transformation in higher education is driven not primarily by technology itself but by the organization's ability to align business process modernization with human capability development and institutional structures. This finding reinforces the argument of Tilson et al., (2010) that digital governance emerges from the alignment between technology, organizational processes, and institutional structures. Recent studies further highlight that a systemic approach integrating technology, organizational governance, and human capability development is a key prerequisite for successful digital transformation in universities (Mabotha & Ngcamu, 2025). Universities that are able to redesign work processes, strengthen human resource capacity, and integrate technological systems comprehensively are therefore better positioned to develop governance systems that are adaptive to the dynamics of change in the digital era. From a practical perspective, these findings provide important implications for university leaders, policymakers, and higher education managers in designing more comprehensive digital transformation strategies. Institutional digitalization strategies should not focus solely on the procurement of technology but must also involve organizational process reform and the strengthening of human resource capacity. By integrating these three elements holistically, higher education institutions can develop governance systems that are more modern, efficient, and responsive to the evolving demands of educational services in the digital age.

Finally, future research may extend these findings by examining digital transformation across different higher education contexts, including variations in governance systems, technological capacity, and organizational culture. Future studies may also adopt quantitative or mixed-method approaches to examine the relationships among business process modernization, organizational adaptation, technology integration, and institutional performance more comprehensively. Longitudinal research designs may

further provide deeper insights into how digital transformation evolves dynamically within higher education organizations over time.

4. CONCLUSION

This study explored how digital transformation reshapes governance processes in higher education institutions by examining the integration of business processes, human resources, and technological systems. The findings demonstrate that digital transformation in university governance is not merely a technological upgrade but a comprehensive organizational change process involving the modernization of business processes, the adaptation of organizational structures and human resources, and the integration of technological systems. The results highlight that business process modernization serves as the foundation of digital transformation by restructuring traditional administrative workflows into more efficient and standardized systems. This transformation requires organizational and human resource adaptation, as institutional actors must develop new digital competencies and adjust their work practices to operate effectively within digital environments. As these organizational adjustments occur, institutions become better positioned to achieve technology integration, which enhances organizational effectiveness through centralized data management, improved coordination across units, and more informed decision-making processes. Conceptually, this study contributes to the literature on digital transformation in higher education by proposing a process-based model that illustrates the dynamic interaction between organizational processes, human resource capabilities, and technological systems. The findings suggest that successful digital transformation depends on the alignment between these three dimensions rather than on technological adoption alone. From a practical perspective, the study provides important implications for university leaders and policymakers. Digital transformation strategies should not focus solely on the procurement of digital technologies but must also involve the redesign of organizational processes and the development of human resource capacities. By integrating these elements holistically, higher education institutions can develop governance systems that are more efficient, transparent, and responsive to the evolving demands of the digital era. Finally, future research may expand this study by examining digital transformation across multiple higher education institutions or by employing quantitative and mixed-method approaches to test the proposed conceptual model in broader institutional contexts.

Ethical Approval

Not Applicable

Informed Consent Statement

All interview participants were informed about the purpose of the study prior to their involvement. Informed consent was obtained verbally, as participants voluntarily agreed to take part in the interviews. All information provided by participants was kept confidential and used solely for academic research purposes.

Authors' Contributions

AM Contributed to conceptualization, research proposal development, preparation of interview guidelines, data analysis. Z Contributed to participant recruitment, conducting interviews, data analysis. BI Contributed to data analysis, interpretation, and development of the discussion section

Disclosure Statement

The authors declare that there is no potential conflict of interest regarding the research, authorship, or publication of this article.

Data Availability Statement

The data supporting this study are available from the corresponding author upon reasonable request. Due to privacy and confidentiality considerations, interview transcripts are not publicly accessible.

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