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*Research Article*

# Design and Development of Information Systems to Enhance Digital Transformation Readiness in Education and Healthcare Organizations

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**Abstract:** This study explores the development and implementation of an information system designed to enhance digital transformation readiness in education and healthcare institutions. With the rapid adoption of digital technologies, both sectors face challenges related to system readiness, infrastructure limitations, and workforce adaptability. The primary objective of this research was to create a comprehensive information system that integrates emerging technologies, such as cloud computing and data analytics, to streamline workflows, improve decision-making processes, and enhance organizational efficiency. The research followed a structured methodology that included system analysis, prototype development, usability evaluation, and the application of a readiness assessment framework. The results indicated that the information system significantly improved both technological infrastructure and human capability, contributing to a more seamless digital transformation process in both sectors. Key findings revealed that the system enhanced governance by improving decision-making processes, ensured scalability and integration with existing technologies, and provided essential training to increase user readiness. This research contributes to the field by providing a holistic approach to digital transformation that includes organizational, technological, and human factors, as opposed to focusing solely on technology. Recommendations for future implementation include prioritizing comprehensive training programs, ensuring leadership commitment, and adopting a phased implementation strategy to manage financial and regulatory challenges. Future research should focus on refining digital transformation readiness frameworks, exploring long-term outcomes, and investigating the role of organizational culture in supporting digital transformation initiatives.

**Keywords:** digital transformation; healthcare institutions; education institutions; system integration; organizational readiness.

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## 1. Introduction

In the education sector, particularly in higher education institutions (HEIs), resistance to change from both instructors and students is a major obstacle. Faculty members often face issues such as a lack of experience with new technologies, privacy concerns, and insufficient training, while students struggle with limited access to resources and difficulties in adapting to digital learning environments. Additionally, psychological barriers, such as low digital self-efficacy, contribute to resistance and hinder the successful integration of digital tools in teaching and learning [1]. Furthermore, inadequate technological infrastructure in many HEIs, including poor connectivity and lack of updated educational policies, exacerbates the difficulties in adopting digital technologies [2]. The absence of proper curriculum development that incorporates digital tools, coupled with insufficient faculty training, further complicates the integration of these technologies.

From an organizational perspective, institutional barriers such as a lack of administrative support and the complexity of organizational structures impede the smooth implementation of digital transformation initiatives [2]. Without strategic planning and resource allocation, the adoption of new technologies becomes even more challenging [1].

In healthcare organizations, the adoption of digital transformation is hindered by several technological and infrastructural issues, particularly the challenge of integrating legacy systems with newer technologies, such as artificial intelligence (AI) and telemedicine [3], [4]. Interoperability issues, where medical records and data are not easily shared or unified across systems, complicate the adoption of digital solutions [5]. Additionally, the reliance on outdated technological infrastructure requires substantial investments in upgrading or replacing existing systems, which many healthcare institutions cannot afford [6].

Workforce readiness also plays a significant role in the digital transformation of healthcare. Healthcare professionals need adequate training to develop digital competencies; however, many institutions lack the infrastructure and organizational support necessary for effective training programs [7]. Moreover, leadership and stakeholder engagement are crucial in overcoming resistance to change, yet many organizations struggle with these elements, which further hampers the adoption of digital solutions [6].

In addition to these challenges, healthcare institutions also face regulatory and financial constraints that make it difficult to navigate data privacy laws and secure the necessary funding for digital initiatives [7]. Furthermore, cultural readiness among healthcare staff to embrace digital tools is often lacking, and ethical concerns about the digitalization of healthcare, including the potential for burnout and moral distress among healthcare professionals, add to the complexity [8].

In the education sector, digital transformation is crucial for modernizing educational institutions and improving the quality of education. Emerging technologies, such as artificial intelligence (AI), virtual reality (VR), and big data, are revolutionizing educational models and learning methodologies. These technologies offer innovative approaches to address educational inequalities and promote lifelong learning opportunities [9]. The integration of these technologies not only enhances the learning experience by making it more interactive and engaging but also helps institutions remain competitive on a global scale by producing professionals who can swiftly adapt to modern educational processes and technologies [10], [11].

Moreover, the shift toward digital learning environments allows for the creation of new educational models based on high-performance teaching practices. Lifelong learning systems, supported by digital archives, micro-certificates, and credit banks, are helping to facilitate resource sharing and certification of learning outcomes [9], [12]. However, despite these advancements, educational institutions face several hurdles, including inadequate policy support, challenges related to data security and privacy protection, and the need for inter-departmental cooperation [12].

In healthcare, the role of digital transformation is equally significant. Technologies such as AI, the Internet of Things (IoT), and big data are reshaping healthcare delivery by improving care quality, reducing costs, and enhancing the overall patient experience. The adoption of digital tools has led to improvements in efficiency and has played a pivotal role in reducing operational costs while enhancing the management of healthcare records and transactions [13], [14]. Furthermore, digital transformation has enabled healthcare institutions to adopt a patient-centered approach, improving patient engagement and satisfaction by making healthcare services more accessible and convenient [13].

One of the key components of digital transformation in healthcare is technological integration. The implementation of cloud computing, AI, and IoT has revolutionized healthcare delivery and management, allowing for more efficient and effective service provision [14], [15]. However, healthcare institutions face significant barriers related to interoperability, the reliance on legacy systems, and the need for substantial investment in new infrastructure [16]. Additionally, workforce development is crucial, as healthcare professionals need to be digitally ready and capable to utilize these technologies effectively [17].

The design and development of information systems play a central role in supporting and enhancing organizational readiness for digital transformation. These systems enable the seamless integration of emerging technologies, improve organizational processes, and contribute to a culture of continuous improvement and innovation. In both education and healthcare sectors, information systems help bridge the gap between technology and the organization by providing frameworks that assess and improve the maturity of systems, ensuring

they meet the evolving needs of these institutions [13], [18]. However, achieving digital transformation readiness requires addressing organizational and technological barriers, which can be overcome by developing robust frameworks and ensuring comprehensive training for the workforce [19].

## 2. Literature Review

### Digital Transformation in Education and Healthcare

Digital transformation has reshaped the education sector by facilitating personalized learning experiences, enhancing access to resources, and fostering collaborative learning environments [20]. Emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), and big data have enabled educational institutions to provide more flexible and engaging learning experiences, which are tailored to individual students' needs [9]. These innovations help bridge the gap of educational inequalities by providing more equitable access to quality resources, especially in remote areas. Furthermore, AI and IoT have improved affordability and accessibility in education, making learning more feasible and sustainable for a wider range of students [20].

The integration of digital tools has led to transformative learning experiences in various fields such as sports and nursing, enhancing skill acquisition and performance [21]. By incorporating digital tools into curricula and evaluation methods, education systems can better engage students and provide more meaningful learning outcomes. However, despite the progress, challenges such as inadequate digital literacy among both students and faculty, and the complexity of adapting traditional educational models to digital formats, continue to slow the process of digital transformation [12].

In the healthcare sector, digital transformation is revolutionizing patient care, diagnostics, and service delivery, particularly through the integration of AI, IoT, and big data [22]. These technologies contribute to significant improvements in healthcare quality, efficiency, and the overall patient experience by enabling better diagnostics, real-time monitoring, and personalized care plans [7], [13]. Digital health applications also play a key role in reducing healthcare inequalities, particularly in underserved regions, by improving access to services and information [23]. Furthermore, the adoption of digital technologies in healthcare leads to considerable cost savings, improved operational efficiency, and more streamlined management of healthcare records [15], [24].

However, the healthcare sector faces unique challenges, including interoperability issues between existing legacy systems and newer technologies, as well as the substantial financial investments required for infrastructure updates [22]. Additionally, healthcare professionals require extensive training to become digitally competent, but many healthcare institutions lack the necessary resources to provide adequate digital literacy programs [25]. These gaps hinder the effective implementation and utilization of digital technologies in healthcare settings, particularly in developing regions.

Both the education and healthcare sectors face significant barriers related to digital literacy and training, which hinder the effective adoption of digital tools. Inadequate digital literacy among educators, students, healthcare professionals, and administrators remains one of the largest challenges to the successful implementation of digital transformation initiatives [7], [22]. Without proper training and development, stakeholders in both sectors are unable to fully leverage the potential of digital technologies, limiting the scope and impact of digital transformation efforts.

Another significant challenge is the issue of interoperability and scalability, especially in healthcare systems, where integrating new digital solutions with existing infrastructure often proves difficult [22], [24]. Moreover, financial constraints in both sectors exacerbate the problem, as the investment required to upgrade systems and build the necessary infrastructure is often beyond the means of many institutions, particularly in lower-income regions [26].

Ethical and regulatory concerns also pose significant barriers, particularly in healthcare, where issues surrounding patient data privacy and security are paramount [27]. In education, similar concerns about data security and the ethical use of AI and digital tools in the classroom need to be addressed to ensure a safe and equitable digital learning environment [23].

### Existing Frameworks for Assessing Organizational Readiness for Digital Transformation

Digital transformation (DT) frameworks are essential for evaluating an organization's preparedness to implement digital technologies and processes effectively. Various frameworks have been developed to assess organizational readiness across different sectors. For example, the AI Readiness Framework evaluates an organization's ability to deploy AI technologies, focusing on dimensions like technology, activities, boundaries, and goals [28]. The Digital Transformation Readiness Assessment (DTRA) is tailored for Russian companies and helps evaluate readiness using qualitative domains, providing a comprehensive view of an organization's digital maturity [22]. Meanwhile, the Organizational Digital Transformation Readiness (ODTR) framework considers key elements like technological resources, business processes, management capability, and organizational culture, ensuring a holistic approach to assessing an organization's digital transformation potential [29].

Factors contributing to successful digital transformation readiness are multifaceted. Key enablers include technological resources, leadership and governance, organizational culture, human capability, strategic alignment, and financial resources [29], [30]. These components are critical in preparing organizations to not only adopt new technologies but also integrate them effectively within the existing organizational framework. Strong leadership commitment, a culture that supports innovation, and alignment of digital initiatives with business goals are fundamental to ensuring the success of digital transformation [22]. Furthermore, adequate financial planning is necessary to support these efforts and overcome the resource barriers often encountered during digital transformation.

However, several challenges hinder the successful adoption of digital transformation. These include resistance to change, lack of technological maturity, inadequate leadership, cultural barriers, insufficient skills and training, and financial constraints [20], [31]. Organizational resistance, particularly from employees who are not adequately trained or who are reluctant to embrace new technologies, can slow down the entire transformation process. Moreover, insufficient investment in infrastructure and a lack of leadership vision can limit the effectiveness of digital initiatives. Addressing these challenges through targeted training programs, phased implementation strategies, and strong leadership is crucial for enhancing organizational readiness and ensuring the long-term success of digital transformation initiatives [32].

### Technological vs. Holistic Approaches in Digital Transformation

The technological approach to digital transformation focuses on the integration of advanced technologies, such as big data, artificial intelligence (AI), and cloud computing, to enhance organizational efficiency and innovation [33]. This approach primarily targets optimizing workflows, automating tasks, and implementing data-driven decision-making processes. By leveraging technologies like AI and cloud computing, organizations can streamline their operations, reduce costs, and improve overall productivity. However, this approach often faces significant challenges, particularly when it neglects other crucial aspects such as leadership, personnel training, and organizational culture [34]. A purely technology-driven transformation can lead to risks like insufficient digital competency, skill gaps, and resistance to change from employees [35]. Over-relying on technology without addressing human factors can undermine the long-term success of the transformation.

In contrast, the holistic approach to digital transformation integrates technological advancements with organizational and human factors. This approach ensures that digital technologies are aligned with the overall strategic goals, values, and culture of the business, promoting long-term adaptability and efficiency [34]. A key aspect of the holistic approach is its focus on human factors, such as improving employees' digital competencies and revising corporate culture to support innovation [36]. By emphasizing human-centric value creation, organizations can improve productivity while ensuring workers' well-being, which is critical for sustaining a healthy work environment [35]. Holistic frameworks, such as the Technology-Organization-Environment (TOE) framework, are particularly useful in guiding organizations through the complex interplay between digital transformation, innovation, and environmental, social, and governance (ESG) principles [36]. These frameworks provide a more balanced approach by integrating digital transformation with sustainability and organizational resilience.

While the technological approach focuses on the rapid adoption of cutting-edge technologies, the holistic approach places equal emphasis on the organizational culture, human capabilities, and strategic alignment with business goals. The technological approach can lead to quick wins in terms of process automation and innovation but may fail to account for the long-term needs of the organization, including workforce adaptation and alignment with broader strategic goals [37]. On the other hand, the holistic approach encourages organizations to consider all aspects of digital transformation, ensuring that technology adoption is sustainable and supported by appropriate leadership, training, and organizational structures [38]. As digital transformation continues to evolve, a balanced integration of both approaches may be the most effective strategy for organizations seeking to achieve lasting and meaningful transformation.

### Digital Transformation and Organizational Readiness

Digital transformation in the context of educational and healthcare organizations refers to a fundamental change in how operations are conducted, services are delivered, and information is managed through digital technologies. [39] explain that digitalization is not only about adopting new technologies but also about developing information systems that can accelerate digital transformation readiness. This readiness involves various aspects, from adequate infrastructure to an organizational culture that is adaptable to technological changes.

An effective information system can expedite this digital transition, particularly in educational and healthcare organizations. For example, [40] developed the CICA Framework, which combines Corporate Social Responsibility (CSR), AI, and blockchain to support a sustainable digital culture. This framework emphasizes how technology can be used to strengthen sustainability, which is essential for organizations undergoing digital transformation.

### Information System Security in the Digital Era

One of the biggest challenges organizations face when adopting information systems is security. In the context of education and healthcare, protecting sensitive data is a top priority. Danang, Siswanto, et al., (2025) developed a federated ensemble learning approach to detect DDoS attacks in real-time in Industrial Internet of Things (IIoT) environments. Security systems designed with such approaches can minimize the risks posed to sensitive data in both sectors.

Additionally, blockchain and related technologies, such as Trusted Execution Environments (TEE), can enhance the reliability and transparency of data management. Danang, Dewi, et al., (2025) explain that integrating AI with blockchain can improve cloud data security, allowing educational and healthcare organizations to protect their user data more effectively.

## AI Technology Implementation in the Digitalization of Education and Healthcare Sectors

The use of advanced technologies such as AI and machine learning (ML) in the development of information systems within the education and healthcare sectors offers tremendous potential for improving operational efficiency. Danang, Siswanto, Aryani, et al., (2025) developed a Zero Trust model that can optimize service continuity in the cloud environment, even under sophisticated threats such as DDoS attacks. This approach is highly relevant because the education and healthcare sectors are often connected with large amounts of data and require high-level security to avoid service disruptions.

Furthermore, the use of federated learning for threat detection also helps optimize system performance without compromising privacy. Danang, Dianta, Santoso, et al., (2025) elaborate that a federated CNN-GRU model can help detect DDoS attacks in SDN (Software Defined Networking) environments through image-based traffic analysis. This technology is

crucial for analyzing and mitigating threats in real time, which is essential for ensuring the operational continuity of critical sectors like education and healthcare.

### The Role of Blockchain in Enhancing Digital Sustainability

Blockchain is not only used for security but also for improving transparency and accountability in information systems. Danang, Haryani, Aini, et al., (2025) demonstrate that blockchain can strengthen digital literacy and e-governance by providing a secure and transparent platform for data management. In the education and healthcare sectors, this technology can be applied to ensure that all data transactions are conducted honestly and can be accounted for, improving the integrity of the information systems used by these sectors.

The digital sustainability referred to here not only concerns environmental sustainability but also operational and social sustainability. (Danang, Dianta, Santoso, et al., (2025) emphasize the importance of building a sustainable digital culture, which can be implemented in educational institutions and hospitals by using technologies that prioritize sustainability, security, and efficiency in data management.

### Technology Collaboration Innovation to Improve Organizational Efficiency

To achieve successful digital transformation, collaboration between various technologies is essential. (Danang, Dianta, Santoso, et al., (2025) propose the use of a hybrid CNN-GRU model for adaptive mitigation of DDoS attacks combined with image-based traffic analysis. This technology can be used to secure the digital infrastructure supporting the operations of educational and healthcare sectors. With the right combination of technologies, organizations can ensure that they not only maintain data security but also enhance their overall system performance.

## 3. Proposed Method

The research methodology involved four key steps. First, a system analysis was conducted to identify strengths and weaknesses in current information systems within education and healthcare institutions, focusing on gaps in infrastructure, technology, and user training. Next, a prototype was developed using emerging technologies like AI and cloud computing, designed to streamline workflows and improve decision-making. Afterward, the usability evaluation assessed how well the prototype met user needs through testing and feedback from stakeholders. Finally, a readiness assessment framework was applied to evaluate the institutions' preparedness for digital transformation, focusing on governance, infrastructure, and user capability, providing a clear picture of their readiness and areas for improvement.

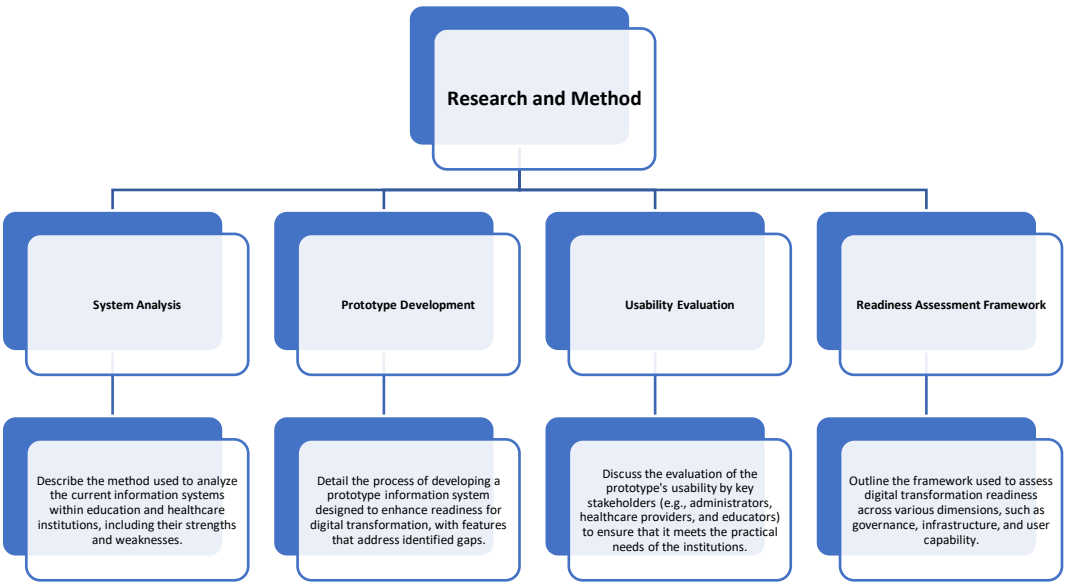

**Figure 1.** Flowchart structure.

### System Analysis

The first step in the research methodology was conducting a thorough system analysis of the current information systems within education and healthcare institutions. The analysis focused on identifying the strengths and weaknesses of the existing systems, particularly in their ability to support digital transformation initiatives. The analysis involved reviewing institutional records, conducting interviews with key stakeholders (e.g., administrators, healthcare providers, and educators), and performing a gap analysis to determine areas where the current systems were failing to meet the evolving needs of the organizations. This phase allowed the research team to pinpoint critical deficiencies in the infrastructure, such as insufficient technological resources, poor integration of existing systems, and lack of comprehensive user training, which are often cited as barriers to effective digital transformation.

### Prototype Development

Following the system analysis, the next phase was the prototype development of a digital information system designed to address the identified gaps and enhance digital transformation readiness. The prototype was built with the goal of integrating emerging technologies, such as cloud computing and AI, to streamline workflows, improve decision-making processes, and foster collaboration across departments. Key features of the prototype included an intuitive user interface, advanced data analytics tools, and a scalable infrastructure that could be easily adapted to the institution's specific needs. The development process followed an agile methodology, enabling continuous feedback from stakeholders to ensure the system's functionality aligned with the institutions' strategic objectives. This iterative development process was crucial for creating systems that are both adaptable and user-friendly.

### Usability Evaluation

Once the prototype was developed, a usability evaluation was conducted to assess how well the system met the practical needs of its users, including administrators, healthcare providers, and educators. This evaluation process was conducted through a series of structured usability testing sessions, where users interacted with the prototype in controlled environments to identify issues related to functionality, ease of use, and overall effectiveness. Stakeholders provided valuable feedback through surveys and focus groups, allowing the research team to refine the prototype and ensure that it addressed the specific needs of the users. This step was crucial, as the success of any digital transformation initiative depends not only on the technology itself but also on its acceptance and effective use by the intended users.

### Readiness Assessment Framework

To assess the digital transformation readiness of the institutions, a readiness assessment framework was employed. This framework evaluated the institutions across several critical dimensions, including governance, infrastructure, and user capability. The governance dimension focused on the leadership's commitment to digital transformation and the strategic alignment of digital initiatives with organizational goals. The infrastructure dimension assessed the technological resources available, including hardware, software, and network capabilities. Finally, the user capability dimension evaluated the readiness of staff and faculty to adopt and effectively use digital tools, with a focus on digital literacy and training. By using this comprehensive framework, the research team was able to provide a clear picture of the institutions' current state and identify areas requiring further development to fully support digital transformation.

## 4. Results and Discussion

The newly developed information system significantly enhanced digital transformation readiness in education and healthcare institutions by addressing key infrastructure gaps and incorporating technologies like cloud computing and data analytics. It improved operational efficiency, streamlined workflows, and facilitated better decision-making through real-time

data and analytics. The system's seamless integration with existing platforms, such as electronic health records and learning management systems, enabled scalability without requiring major infrastructure overhauls. Additionally, targeted training modules enhanced user readiness, reducing resistance to change and empowering educators and healthcare professionals to effectively adopt digital tools. This holistic approach ensured that the digital transformation was not only technologically successful but also aligned with governance goals and supported by improved user capabilities.

## Results

The results of the system analysis and prototype development showed that the newly developed information system significantly enhanced the readiness for digital transformation in both education and healthcare institutions. The system addressed key gaps in the existing infrastructure, such as insufficient technological resources and poor system integration, by incorporating advanced technologies like cloud computing and data analytics. This allowed institutions to improve operational efficiency, streamline workflows, and automate decision-making processes. Stakeholder feedback from usability evaluations confirmed that the system met the practical needs of administrators, healthcare providers, and educators, enabling more effective management and service delivery. Furthermore, the system's intuitive design and user-friendly interface allowed for a smooth adoption process across all levels of the organization.

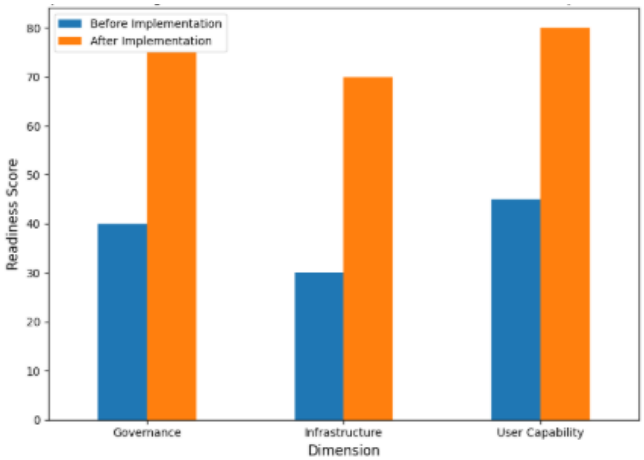


**Figure 2.** Comparison of Digital Transformation Readiness: Before and After Implementation.

The figure above compares readiness scores for key dimensions (Governance, Infrastructure, and User Capability) before and after information system implementation. As shown, system implementation significantly improved organizational readiness across all dimensions, with the most significant improvements seen in governance and user capability.

The prototype also demonstrated its scalability and integration capabilities. In healthcare institutions, it facilitated the seamless integration of electronic health records (EHR) and telemedicine platforms, while in education, it connected with existing learning management systems (LMS). These integrations enabled institutions to expand their digital tools without overhauling their entire infrastructure, allowing for greater flexibility and future growth. Moreover, the system's ability to adapt to various institutional needs highlighted its potential for supporting long-term digital transformation.

## Discussion

The system's impact on governance was significant, particularly in enhancing decision-making processes within both sectors. In healthcare, the system's real-time data reporting and advanced analytics tools allowed administrators to make more informed, evidence-based decisions, improving both clinical and operational workflows. Similarly, in education, the system streamlined communication between administrators and faculty, ensuring that digital transformation goals aligned with institutional objectives. This alignment between governance and

digital transformation goals is crucial for the success of any digital initiative, as it ensures that leadership supports and guides the transformation in a coherent and strategic manner.

In terms of infrastructure, the prototype's ability to integrate seamlessly with existing systems was a critical strength. Both sectors face challenges with legacy systems that hinder the adoption of new technologies. However, the new system addressed this issue by using cloud-based technologies and flexible integration methods, allowing institutions to update their infrastructure without requiring a complete overhaul. In healthcare, the integration of patient records and telemedicine systems streamlined patient care, improving both the quality and efficiency of service delivery. In education, the system facilitated the adoption of digital teaching tools without disrupting existing academic processes, enabling smoother transitions to digital learning environments.

Finally, the user capability improvements were essential in ensuring that the digital transformation was both effective and sustainable. The system included training modules that helped educators and healthcare professionals develop the necessary skills to use new digital tools effectively. By enhancing digital literacy, the system reduced resistance to change and empowered users to embrace new technologies, which is often a major barrier to successful digital transformation. The increase in user readiness across both sectors demonstrated that when proper training and support are provided, digital transformation can be successfully implemented, improving organizational processes and outcomes in the long term.

## 5. Comparison

The results of the prototype developed in this study highlight the advantages of a holistic approach to digital transformation, in contrast to existing technology-driven solutions that focus primarily on infrastructure or technology alone. While technology-driven solutions typically prioritize the adoption of advanced tools and systems, they often overlook essential factors such as organizational culture, human capacity, and governance. These solutions, while effective in automating processes and enhancing operational efficiency, fail to address the broader needs of the organization, including employee readiness and leadership support. In contrast, the holistic approach adopted in this study integrated technology with organizational change and human factors, ensuring that digital tools were aligned with the institution's goals and cultural values. This approach not only facilitated smoother implementation but also contributed to long-term sustainability by enhancing user capabilities and improving governance structures. The holistic model showed greater potential for lasting impact, as it addressed both technological and human dimensions of digital transformation, something that technology-driven solutions alone often lack.

The holistic approach employed in this study, which incorporated governance, organizational change, and human capacity building, resulted in more significant improvements in organizational readiness compared to isolated technology-driven interventions. The prototype system was designed not only to integrate emerging technologies but also to support leadership decision-making and foster a culture of adaptability and innovation. By aligning the system with the institution's strategic goals and supporting continuous training for staff, the holistic approach ensured that digital transformation was not just about technology adoption but about creating a culture ready to sustain and adapt to ongoing technological advancements.

In comparison, technology-driven interventions that focus solely on infrastructure or technology often fall short in preparing the organization for long-term success. These interventions tend to emphasize the immediate benefits of automation and process optimization, but they do not address the fundamental need for organizational alignment, employee engagement, and leadership commitment. As a result, organizations may face challenges in fully utilizing the technology or maintaining it over time. In this study, the emphasis on governance and user capability not only improved short-term operational efficiency but also contributed to building a workforce that was digitally literate and adaptable to future technological changes. This approach led to more comprehensive organizational readiness and better alignment with the goals of digital transformation, demonstrating the effectiveness of the holistic model in driving successful and sustainable digital transformation.

## 6. Conclusions

The results of this research demonstrated that the developed information system significantly enhanced digital transformation readiness in both education and healthcare institutions. The system addressed key gaps identified in the initial system analysis, including limitations in technological resources, infrastructure integration, and user training. By incorporating advanced technologies such as cloud computing and data analytics, the system streamlined workflows, improved decision-making, and enabled more efficient management of institutional processes. Furthermore, the system's user-friendly interface and integration capabilities allowed for seamless adaptation to existing systems, facilitating smooth transitions and improving operational efficiency. Overall, the system contributed to both short-term improvements in organizational processes and long-term readiness for sustained digital transformation.

This research makes both theoretical and practical contributions to the field of digital transformation. Theoretically, it extends the understanding of how information systems can support organizational readiness by integrating not only technological components but also human and organizational factors. The study underscores the importance of governance, infrastructure, and user capability in achieving successful digital transformation, offering a more comprehensive perspective than traditional technology-focused approaches. Practically, the research provides a tangible framework for institutions seeking to enhance their digital transformation readiness. The development and evaluation of the prototype system offer actionable insights for educational and healthcare institutions aiming to modernize their operations and improve service delivery through digital tools.

Based on the findings, institutions looking to adopt similar information systems and strategies for digital transformation readiness should prioritize a holistic approach. This involves integrating technology with organizational change, governance, and human capability. Institutions should invest in robust training programs to build digital literacy among staff and ensure leadership commitment to drive digital initiatives forward. Additionally, systems should be designed with scalability in mind, allowing for seamless integration with existing infrastructure and the flexibility to adapt to future technological developments. A phased implementation strategy is recommended to manage financial and regulatory challenges while ensuring long-term sustainability.

Future research could focus on refining the frameworks for assessing digital transformation readiness, particularly in the context of different sectors. Research could explore the long-term impact of the developed systems on digital transformation outcomes, such as improvements in organizational performance, employee engagement, and service delivery. Additionally, further studies could investigate the role of organizational culture and leadership in facilitating or hindering digital transformation, providing deeper insights into how human and organizational factors can be better integrated into digital transformation strategies. Exploring the scalability of the developed system in different institutional contexts could also provide valuable insights into its broader applicability and effectiveness.

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