

Designing a Framework for IT-Enabled Governance and Administrative Systems in Indian Higher Education Institutions

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Abstract

The operational context for Higher Education Institutions (HEIs) has become more difficult to navigate due to a large number of students, many regulations, and increasing stakeholder expectations. Due to the rapid pace of change within this environment traditional manual methods of governance will no longer provide the level of efficiency, transparency or accountability needed. Additionally, numerous digital technologies are available to HEIs including ERP systems, LMS and on-line administrative portals; however, these are typically used in isolation by HEIs resulting in fragmented governance processes. The objective of this study is to address this issue through the development of an integrated IT-enabled governance framework for HEIs.

This framework was developed utilizing both literature review and empirical research to examine how digital technologies impact the administration and transparency of an institution's operations.

Governance is viewed as an interrelated system consisting of policy direction; operational processes; information technology infrastructure; and human capabilities. In addition, emphasis is placed on integrating processes, making decisions based upon data; and developing capability to implement effective digital governance. Additionally, rather than focusing solely on adopting new technologies, this study provides a practical guide to assist in implementing sustainable digital transformations in higher education institutions.

Keywords: IT-enabled governance, Higher education administration, Digital governance framework, Educational technology integration, Institutional transparency, Administrative efficiency, Data-driven decision-making, Governance transformation, ERP in higher education, Digital transformation in HEIs

1. Introduction

Higher Education Institutes (HEIs) in India are undergoing a significant change with regards to an increase in student enrollments, expansion of academic programs, enhanced regulatory oversight, and increasing expectations from multiple stakeholders. As HEIs grow and expand, the ability to effectively manage the academic aspects, financial aspects, and administrative aspects of the institution becomes increasingly difficult. Additionally, the need to be transparent, accountable and compliant with regulatory organizations and accrediting agencies adds further layers of complexity that create challenges for HEIs to effectively

govern through traditional means of managing data and making decisions at the institutional level due to the increased amount of data being generated by institutions and the increased need for collaboration among stakeholders at the institutional level to make decisions.

In response to this challenge many HEIs have invested in IT solutions to improve the effectiveness of various components of the academic, financial and administrative functions of the institution (e.g., ERP, LMS, electronic admission processes, etc.). These types of technology can improve the way institutions operate and manage information; however, these solutions are typically developed and deployed separately and therefore cannot provide an integrated approach to the governance of an institution.

This results in disconnected flow of information, inconsistent use of technology and lack of alignment between technology and institutional strategy. Therefore, there is a clear gap between the adoption of technology and formalized governance practices. Institutions need a cohesive framework which integrates policy, processes, people, and digital systems to provide effective governance.

The purpose of this research is to develop an Integrated IT-enabled Governance Framework which will formally connect governance functions with digital infrastructure to enhance the effectiveness of decision-making, transparency and institutional decision-making.

2. Literature Review

The past ten years have shown that the use of technology for governance in higher education is a growing field of scholarly investigation. Researchers all agree that information and communication technologies have the ability to alter how educational institutions are run, how they communicate with their students and faculty and staff, and how well they deliver services to the public (Akour & Alenezi, 2022; Bianchi et al., 2021). This includes such systems as ERP (Enterprise Resource Planning), LMS (Learning Management System), Student Information Platforms, Web-Based Administrative Solutions, etc. The above systems are seen as crucial for managing contemporary higher education institutions (Kumar et al., 2020; Usha Rani et al., 2023). Significant body of research has demonstrated that the application of IT within higher education leads to substantial improvements in operational effectiveness. The use of information technology (IT) has proven to be beneficial in a variety of ways, including enhancing student admission processes, exam administration, financial management, and other human resource functions within post-secondary education. In addition, using IT enables the automation of some tasks and allows for the reduction of employee workload, the elimination of errors that may occur during manual processing, and the acceleration of internal operational processes (Srinivasan, 2018; Rao & Kumar, 2018). The use of electronic record-keeping systems increases accountability within institutions due to its consistency in recording events and actions, and the ability to track those events and actions over time, as well as monitor institutional activities (Reddy & Rao, 2019; Kumar & Jain, 2017).

In addition to the benefits previously mentioned, literature has identified another general advantage of IT systems – the provision of evidence-based decision making. As institutions become more reliant on real-time data analysis to assess performance, allocate resources, and plan future developments within the institution, the compilation of data from various departments provides a basis for coordinated and informed governance (Mitro & Acharya, 2020; Prakash & Gupta, 2020).

While there are several advantages to implementing IT systems within institutions, the literature also identifies several potential obstacles or barriers to the successful implementation of such systems. A few of the most common barriers to successful implementation of IT systems include a lack of necessary

infrastructure, inadequate training of personnel, limited financial resources, and resistance by the institution to the adoption of new technologies (Patil & Kulkarni, 2019; Sharma & Singh, 2019). Literature suggests that simply implementing technology will not result in enhanced governance unless the institution continues to invest in the maintenance of the technology through ongoing professional development (Wang, 2024; Julianti et al., 2021).

A significant limitation of existing research is that it has focused primarily on the effectiveness of individual digital tools versus the overall governance structures. While many studies have evaluated the effectiveness of individual digital tools (e.g. ERP systems and/or Learning Management Systems), very few research studies have explored the relationship between the two digital tools and how they work together as part of a unified governance structure (Usha Rani et al., 2023; Kumar et al., 2020). Similarly, there is little research exploring the interconnections between policy frameworks, administrative workflow processes, IT infrastructure, and human resource roles (Akour & Alenezi, 2022; Bianchi et al., 2021).

Therefore, although the literature demonstrates that IT can contribute to greater efficiencies, greater transparency, and better decision support, it also identifies a need for a comprehensive governance model that integrates the technological components into a broad governance structure for institutions of higher education. In order to address this gap, the proposed study will develop a structured IT-enabled governance framework that systematically links policy, operational processes, digital systems, and human capabilities within institutions of higher education.

3. Background & Literature Gap

Institutional Governance in Higher Education Institutions - A New Approach Many studies have been conducted on how Information Technology (IT) has impacted the governance and administration within institutions of higher learning. Each study has shown that the implementation of digital systems will help institutions perform at a higher level by improving transparency, improving operational efficiency, improving communication, and improving decision making using available data and information. Studies have also indicated that technology platforms are being utilized for the day-to-day operation of an institution such as management of admissions, support of faculty, support of students, coordination of all aspects of an institution, as well as assist in maintaining regulatory compliance and accountability.

Therefore, the results of these studies reinforce the growing importance of IT as a major factor in the governance of modern higher education institutions.

Although the above-mentioned studies demonstrate the positive effects of IT on institutional performance, most of the research related to IT and institutional governance focuses on the individual components of technology, such as Enterprise Resource Planning (ERP), Learning Management Systems (LMS), and online service systems. While most of the studies measure the success of IT systems by assessing the rate of adoption, technical success, and success of functional uses, they give relatively little attention to how these systems work together as part of an overall governance structure. As a result, IT is usually viewed as a functional tool instead of as a strategic element in the governance design of an institution. There are several significant dimensions that have received very little attention in the research. One dimension is the lack of emphasis on integration frameworks that would provide a basis for linking disparate digital systems into a coherent administrative environment. Another important area is the way authority and responsibility is distributed across administrators, faculty, IT professionals, and governance entities. Finally, there is limited research connecting institutional policy frameworks to the implementation of technology and linking professional development/training to governance goals — both are essential to

implementing technology effectively. The limitations discussed show the necessity to consider all aspects of the governance process with a wide view, integrating policies, processes, skills, and systems to fully comprehend the governance process utilizing technology. This shows the necessity to develop a complete framework for IT-enabled governance in higher education institutions where IT is viewed as a system-wide component of digital governance, rather than as separate tools to be used by an institution. Although the advantages of developing a governance framework for IT-enabled governance exists, the literature also identifies several barriers to successfully implementing technology. Some of these barriers include: infrastructure problems, personnel shortages, funding constraints, and resistance to change within organizations (Patil & Kulkarni, 2019; Sharma & Singh, 2019). In addition, the literature suggests that just adopting technology will not result in improved governance unless the institution is prepared to adequately utilize technology and continually develops its capacity to do so (Wang, 2024; Julianti et al., 2021).

One of the most significant limitations of current research is the narrow focus on individual digital tools, versus the entire governance structure. While much of the research conducted on the effectiveness of individual tools (e.g. ERP, LMS) does not examine how each tool functions together to form a single governance structure (Usha Rani et al., 2023; Kumar et al., 2020), there has been limited research to-date on the interrelationships between: the policy frameworks, administrative workflow, IT infrastructure, and human resource roles (Akour & Alenezi, 2022; Bianchi et al., 2021). Therefore, while the literature indicates that IT enhances institutional performance through increased efficiency, transparency, and decision support, the literature also illustrates the lack of a comprehensive governance framework, addressing how to combine the different components of technology in a manner consistent with an institutional governance architecture.

With this lack of a governance model identified, the purpose of this study is to develop a structured IT-enabled governance framework that links policy, processes, digital systems, and human competencies in higher education institutions.

4. Research Objective of This Paper

The objective of this research is to create an organizational system for managing HEI's using technology, in order to provide a structured approach to governance rather than simply a technology implementation. While previous research demonstrates that implementing technology in HEI's improves administrative efficiency, improves transparency and provides a better decision making environment, this research demonstrates how these improvements can be used to create a formalized governance structure. The intent of this research is to translate empirical research into a formalized governance structure that includes digital technologies and institutional administrative functions. One of the main goals of the research is to develop an IT enabled governance framework for use by HEI's that reflects their operational context. The framework will include the relationship between institutional policy, governance mechanisms, administrative process and technological platforms and will therefore address the current disconnect between the technology implementation and coordinated governance practice. In addition to creating a governance framework for use by HEI's, the research intends to associate specific governance activities such as admissions, examination, financial management, human resources, student services and compliance processes with appropriate IT systems. By linking these governance activities to technology, the research will ensure that the technology used is supporting the governance responsibilities of HEI's. Finally, the research intends to provide clarity on roles and digital procedures within the framework which

will enable HEI's to have coordinated actions among administrators, faculty, IT personnel and governing bodies for long-term digital governance.

5. Methodology Basis for Framework Design

The framework for IT enabled governance that was developed in this paper has been grounded in both an empirical approach using data collection, and a conceptual approach using literature analysis. The conceptual basis of the framework was built upon a comprehensive literature review of digital governance, higher education administration and institutional technology systems. The body of literature reviews demonstrated the positive impact of digital tools on administrative processes; however, this body of literature also demonstrated the absence of a coordinated governance structure. As such, the literature review provided insight into the governance elements that are necessary and how these governance elements are related to technology-based systems.

In addition to the conceptual grounding of the framework, the development of the framework was further informed by empirical data obtained from a structured survey of 150 individuals representing all types of higher education institutions (i.e., faculty, administrative staff and institutional personnel). Survey participants noted many ways in which IT Systems have improved, such as with better efficiency, better information management, a more transparent environment and with better communication. In addition to the positive results reported by survey participants with regard to their utilization of IT systems, survey participants also reported several practical barriers to utilizing technology-based systems for improving administrative procedures. These barriers included: a lack of training on how to properly use technology-based systems; insufficient hardware, software or other infrastructure to support technology-based systems; an aversion to change in order to accommodate the introduction of new technologies; and budget constraints. These practical challenges were incorporated into the model so that it could be applied in realistic settings of higher education institutions. Finally, the four dimensions of governance identified in the study—efficiency, transparency, compliance, and decision support—were identified as critical components of the alignment of IT systems with governance functions within the framework.

6. Core Section — Proposed IT-Enabled Governance Framework

In this study, the IT-enabled governance framework, identifies the digital governance in HEIs as a complex, multi-layered system where policies, technological infrastructure, administrative processes, human competencies, and results of governance, interact and work together. The IT-enabled governance framework does not view technology as separate solutions, but rather, it views technology as part of an established governance structure. The model has been designed with five integrated layers.

Layer 1: Governance Structure Layer

This layer constitutes the foundational institutional governance framework; this includes governing bodies, academic and administrative council structures, and the hierarchical structure, which oversees and executes plans, makes decisions and implements those decisions. In addition to connections with regulatory and accrediting agencies, such as UGC, NAAC, AICTE, and all statutory organizations, this layer ensures that institutional regulations, obligations, and strategic priorities will guide how digital systems are used.

Layer 2: IT Infrastructure Layer

The second layer provides the technological foundation for supporting governance activities. It consists of ERP, LMS, central data management systems, and various automation technologies (e.g., Biometric

Attendance and Electronic Record Systems). The goal of this layer is to deliver real-time, unified and secure information to support governance functions.

Layer 3: Process Integration Layer

The third layer is where digital technology is integrated into significant administrative processes. These processes, which include admissions, examinations, HR functions, financial functions and student services, are linked with systems to eliminate departmental silos and enable automated workflows based on the use of digital technologies.

Layer 4: Human and Capacity Layer

The fourth layer acknowledges the level of institutional preparedness required to successfully implement and sustain a fully operational digital environment. The emphasis is placed on the design of continuous training programs, change management strategies and the development of digital competencies among faculty, staff and IT employees. By developing adequate human resources, organizations will be able to maximize their investment in technology.

Layer 5: Governance Outcome Layer

This final layer (or 5th layer) reflects the tangible results of governance which are derived from the findings of this research based on empirical data collected over the period of time in question. Efficiency was increased; the transparency of the institution was increased; the administrative burdens placed upon all personnel were decreased; compliance with existing regulations was increased; and, ultimately, decision-making is now more informed as a result of the implementation of an integrated governance model. Together, these results reflect the potential for an integrated governance model to positively impact the overall administration of an institution.

Layer 1 – Governance Structure

(Policies, Councils, Regulatory Alignment)

Layer 2 – IT Infrastructure

(ERP, LMS, Data Systems, Automation Technologies)

Layer 3 – Process Integration

(Admissions, Exams, HR, Finance, Student Services)

Layer 4 – Human & Capacity

(Training, Change Management, Digital Competencies)

Layer 5 – Governance Outcomes

(Efficiency, Transparency, Compliance, Decision Support)

7. Framework Workflow Explanation

It-based governance framework: beginning at the beginning

The IT based governance framework represents an iterative and cyclical approach to achieving institutional policy objectives through the application of administrative technologies to accomplish administrative tasks in order to achieve measurable governance outcomes.

1st - Institutional Policy Objectives are established. The Institutional Policy Objectives establish the boundaries and priority areas for the use of Digital Governance, and the use of Digital Governance, and the establishment of the parameters for the use of Digital Governance and its practices.

2nd - Institutional Policy Objectives are implemented through the configuration of appropriate Digital Technologies (i.e. Enterprise Resource Planning (ERP) systems, Learning Management Systems (LMS), Institutional Data Tools etc.). This is to ensure that institutional policies are reflected in digital applications, rather than merely being stand alone applications with no institutional strategic alignment.

3rd - Once Institutional Policy Objectives have been properly configured into digital technologies, they are then used to automate Institutional Administrative Processes (e.g., Admissions Processing, Examination Management, Financial Administration, Human Resource Functions, Student Services). Automating institutional administrative processes reduces the amount of manual effort required to complete these tasks, improves the accuracy and consistency of these tasks.

4th - The automated Institutional Administrative Processes generate structured data that can be accessed and processed by Centralized Systems. Accurate access to information enables institutional leaders to effectively monitor, report and evaluate the effectiveness of institutional governance.

5th - Institutional Leaders utilize the accessible information to support informed decision-making, which contributes to improved governance outcomes (i.e. increased efficiency, greater transparency, regulatory compliance and reduced administrative burdens) thereby completing the institutional governance cycle.

8. Challenges and Control Mechanisms

Higher Education Institutions (HEIs), which can be impacted by an IT-enabled governance model, face numerous challenges and opportunities for their organization. An important concern about implementing an IT-enabled governance model in HEIs is the fact that many of the institutions have very limited financial resources. These limited financial resources may be used to acquire new software packages, upgrade current hardware, maintain current systems, and provide technical support to end-users. A second challenge to implementing an IT-enabled governance model within HEIs is the limited number of digital skills among both academic and administrative staff. Limited digital skills among academic and administrative staff will negatively affect the ability to effectively and properly utilize various technology platforms. Reluctance to adapt to and utilize new digital systems from individuals who have traditionally worked using non-digital methods create another obstacle to the successful implementation of digital systems into HEIs. Challenges that create obstacles to implementing an IT-enabled governance model into HEIs create opportunities to address these challenges, therefore the framework outlines multiple corrective actions. Implementing an IT-enabled governance model into HEIs in stages over time reduces the total cost of the implementation and enables a smoother transition to utilizing technology. Continued training and development programs provided to employees will enable them to build competencies and become "digital-ready" to properly implement digital systems. Establishing a dedicated IT governance body ensures that digital initiatives are developed and monitored on a coordinated basis. Establishing standardized processes and data management protocols will improve the interoperability of digital systems

and reduce the fragmentation of digital systems. Therefore, the proposed corrective actions will assist in creating an environment in which digital governance is implemented in a sustainable and efficient manner.

9. Framework Validation

The above study proposes a governance model using IT that utilizes both conceptual based reasoning as well as empirical based findings to provide support for it. The positive features of this proposed model are; (1) document how digital systems can improve administrative performance, (2) demonstrate through empirical evidence that utilizing IT provides increased transparency, (3) informed decision-making, and (4) improved administrative efficiency. In addition to documenting the benefit of utilizing IT, the model also outlines the practical barriers encountered during the research process.

These included limited financial resources, the availability of sufficient digital competencies, the adequacy of digital infrastructures, and institutional support. Strategies were developed to address the limitations identified in the research phase. For example, the gradual implementation of new technology, the development of a structured training program, and the establishment of central oversight mechanisms provides a method by which the model could be applied in "real world" operating environments rather than in hypothetical or theoretical ones. Finally, the model aligns with the priorities of institutional governance (policy guidance, workflow, compliance) utilizing digital technologies, thus providing a structure for institutions of higher education to develop a comprehensive and long-term digital governance environment.

10. Implications

The IT enabled governance model that is described above is very relevant to many different groups of stakeholders in the Post-Secondary Education (PSE) Sector.

Institutions of Higher Education (HEIs), the model is a comprehensive process for creating and implementing governance using digital technologies that combine institutional policy, operational processes, employee competencies and Information Systems (IS) as an integrated system. This model will support the transition of HEIs from utilizing individualized applications of technology to use technology to enable administrative integration; thereby improving the efficiency and transparency of HEI operations, compliance with regulatory requirements and quality and timeliness of decision-making. The model should also serve as a guide for HEIs in creating strategic plans to sustain long-term digital transformation. For policymakers, the model is a potential guide for creating standard digital governance models across institutions. The model could provide a basis for developing standards-based policies, accreditation criteria, and regulatory standards to support the effective and responsible application of technology in governance.

For researchers, the model provides a theoretical foundation for conducting additional research and validating the results of this study. Future studies can examine the stages of development of governance processes, best practices for integrating digital technologies in governance processes, and the impact of technology based governance models on the performance of institutions.

11. Conclusion

"Technology adoption in higher education is important but should be extended to the implementation of formal IT-based governance models in order to realize the complete potential of digital tools for the support of administrative tasks. Digital technologies have become more common in supporting

administrative functions; however, they will not reach their potential unless integrated with a formalized framework of governance. The proposed model for this research combines the elements of an institution's policies, administrative workflow, technological systems and people's capabilities to create a unified governance model."

"The model provides a structural relationship between the use of technology and the administrative function of the institution through the provision of digital platforms that can serve to provide input on governance objectives including efficiency, transparency, compliance and informed decision-making. Technology then becomes a tool of strategy as opposed to being a tool of operation in addition to aligning the direction of policy, automation of processes, and use of data in managing through the model. In conclusion, the model acts as a useful resource for higher education institutions seeking to implement long-term and sustainable digital transformations. The model also enables the development of formalized, accountable and results-driven governance structures which ultimately leads to increased institutional effectiveness and improved performance in administration."

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