

Technology and Quality Management as Drivers of Innovation in Faith-based Higher Education

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Abstract

Higher education institutions are experiencing major transformation as digital technologies, data-driven management and knowledge-based economies reshape how universities create and deliver value. Universities increasingly function as complex organizational systems that coordinate knowledge resources, academic services and institutional activities across multiple stakeholders. Within this context, institutional performance depends not only on academic excellence but also on the ability to develop governance capabilities and manage innovation processes effectively. This study examines how leadership, internal control, technological capability and Total Quality Management influence organizational innovation and institutional performance in Christian faith-based higher education institutions in Indonesia. Using a quantitative approach with Partial Least Squares Structural Equation Modeling (PLS-SEM), data were collected from 213 academic and administrative staff members. The findings indicate that technological capability and quality management play a significant role in enhancing organizational innovation, while leadership and internal control do not have direct effects on performance. Organizational innovation emerges as a key mechanism that mediates the relationship between governance capabilities and institutional performance. These results suggest that institutional performance is achieved through the effective transformation of internal capabilities into innovation outcomes. The study offers a novel perspective by integrating governance mechanisms within an innovation-driven performance framework in faith-based higher education institutions. The study contributes to higher education management literature by demonstrating that technological capability and quality management improve institutional performance mainly through organizational innovation in Christian faith-based higher education institutions.

Keywords: Governance Mechanisms, Higher Education, Organizational Innovation, Technology Capability, Total Quality Management.

Introduction

Higher education institutions are undergoing profound transformation as digital technologies, data-driven management and knowledge-based economies reshape how universities create and deliver value. Universities are no longer limited to traditional roles in teaching and research but increasingly operate as complex organizational systems that coordinate knowledge resources, academic services and institutional activities across multiple stakeholders. In this context, institutional performance depends not only on academic excellence but also on the ability of universities to develop governance capabilities, manage innovation processes and effectively integrate organizational resources across institutional units (1–4). The complexity of these processes can be understood through the Educational Supply Chain Management (ESCM) perspective, which conceptualizes higher

education institutions as integrated systems that manage the flow of knowledge, services and institutional interactions across multiple stakeholders. As shown in Figure 1, universities operate within a broader system that connects inputs such as students and knowledge resources, transformation processes involving teaching, research and administrative coordination and outputs including graduates, research contributions and societal impact (5). Figure 1 clarifies the macro-level logic of Educational Supply Chain Management by showing how higher education institutions transform institutional inputs into academic, research and societal outputs. This representation supports the argument that university performance depends on coordinated processes rather than isolated institutional activities. This holistic perspective highlights that institutional performance is not

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only determined by isolated organizational functions but by the effectiveness of coordination

and integration across interconnected institutional processes.

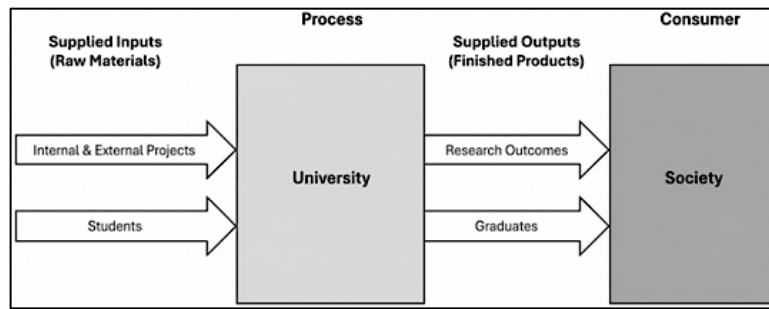


Figure 1: Holistic view of ESCM (5)

Building on this macro-level perspective, the Integrated Tertiary Educational Supply Chain (ITESCM) framework, as presented in Figure 2, provides a more detailed representation of how coordination occurs within higher education institutions. This perspective provides a more detailed view of the internal and external factors involved in the tertiary education supply chain. It illustrates that academic, administrative, research and governance processes are interconnected and require effective coordination to support institutional innovation and performance. ITESCM emphasizes the role of universities as central nodes that facilitate interactions among students, faculty members, administrative units, industry

partners and policymakers. Within this framework, knowledge, information and services flow across institutional actors through coordinated processes supported by organizational systems and managerial practices (5). While ESCM provides a holistic system-level view, ITESCM offers an operational perspective that explains how internal coordination mechanisms enable the transformation of institutional inputs into outputs. Together, these frameworks highlight the importance of governance capabilities in managing institutional complexity and supporting innovation-driven performance.

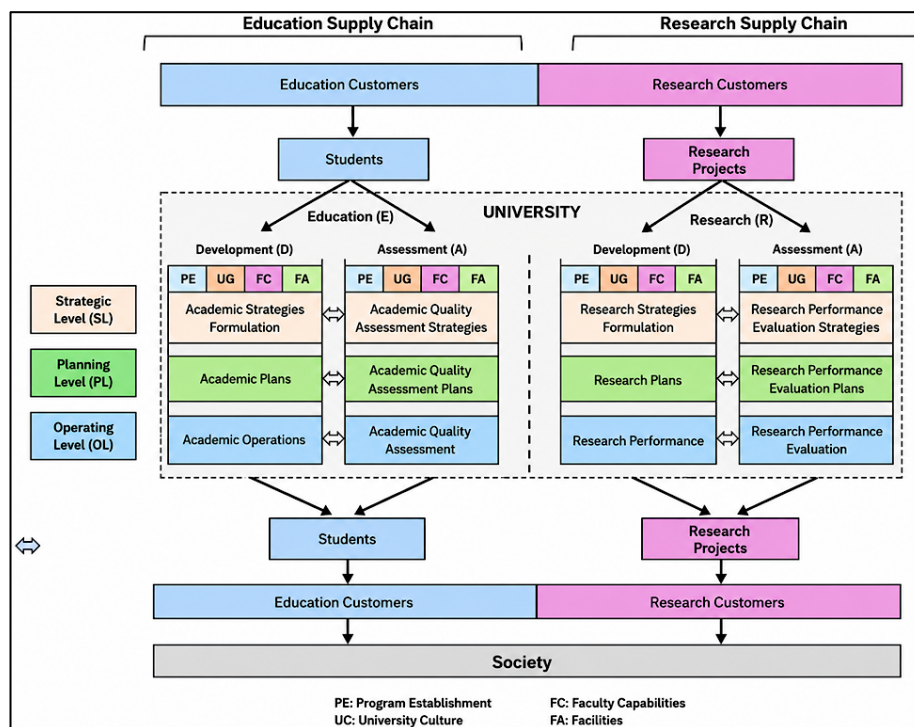


Figure 2: Integrated Tertiary Educational Supply Chain (5)

In faith-based higher education institutions, these coordination processes are further shaped by value-based traditions and religious identity. Such institutions possess unique forms of social and cultural capital that influence leadership practices, organizational commitment and institutional coordination. Religious values may strengthen trust, ethical orientation and collective responsibility among institutional actors, thereby enhancing collaboration and supporting long-term institutional development (6). However, these institutions also face increasing pressure to adapt to digital transformation and institutional modernization, requiring the development of managerial capabilities that support coordination, knowledge sharing and innovation.

From a theoretical standpoint, this study is grounded in the Resource-Based View (RBV), which explains organizational performance as a function of strategic internal resources and capabilities that are valuable, rare, inimitable and non-substitutable (7–10). Within the context of ESCM and ITESCM, governance mechanisms can be conceptualized as organizational capabilities that enable institutions to manage the flow of knowledge and coordinate institutional processes effectively. Leadership, internal control, technological capability and Total Quality Management (TQM) represent key governance-related capabilities that shape how universities integrate distributed resources and support innovation within institutional systems.

Leadership refers to the ability of institutional leaders to provide strategic direction, foster collaboration and promote organizational learning. Internal control reflects mechanisms that ensure transparency, accountability and reliability in institutional processes. Technological capability represents the capacity to utilize digital infrastructures to facilitate knowledge sharing and coordination, while TQM emphasizes continuous improvement and standardized practices that enhance institutional effectiveness. Organizational innovation reflects the ability to introduce new processes and practices, whereas organizational performance represents the achievement of institutional goals and outcomes.

Although prior research has examined these constructs in higher education contexts, most studies have treated governance mechanisms independently rather than as integrated

capabilities within broader coordination systems such as ESCM and ITESCM. Moreover, empirical evidence in faith-based higher education institutions remains limited, particularly in understanding how value-driven governance interacts with technological and managerial capabilities in shaping innovation processes and performance outcomes.

The originality of this study lies in its integration of governance mechanisms, technological capability, quality management and organizational innovation within a single innovation-driven performance framework for Christian faith-based higher education institutions. Previous studies have generally examined leadership, internal control, technology, quality management, innovation, or performance as separate organizational issues. In contrast, this study positions these elements as interrelated institutional capabilities that support the transformation of knowledge, services and governance processes into performance outcomes. The study contributes to existing knowledge in three ways. First, it extends the Resource-Based View by showing how technological capability and quality-oriented governance function as strategic institutional resources in higher education. Second, it advances higher education management literature by explaining organizational innovation as a mediating mechanism between institutional capabilities and performance. Third, it provides empirical evidence from Christian faith-based higher education institutions in Indonesia, a context that remains underrepresented in innovation and performance studies.

Based on the RBV perspective and the coordination logic reflected in ESCM and ITESCM frameworks, governance mechanisms are expected to influence organizational performance both directly and indirectly through organizational innovation. Leadership is expected to enhance collaboration and knowledge integration, internal control to strengthen institutional reliability and coordination, technological capability to support innovation through digital infrastructures and TQM to improve institutional processes through continuous improvement. Organizational innovation is further expected to function as a mediating mechanism that translates these governance capabilities into measurable performance outcomes.

Accordingly, this study addresses the following research questions:

- a) How do leadership, internal control, technological capability and Total Quality Management influence organizational innovation in Christian faith-based higher education institutions?
- b) Do these governance-related capabilities directly affect organizational performance?
- c) Does organizational innovation mediate the relationship between governance-related capabilities and organizational performance?
- d) How do technological capability and quality management contribute to innovation-driven performance in faith-based higher education institutions?

Based on these theoretical arguments, the following hypotheses are proposed: leadership significantly influences organizational innovation (H1), leadership significantly influences organizational performance (H2), organizational innovation mediates the relationship between leadership and organizational performance (H3), internal control significantly influences organizational innovation (H4), internal control significantly influences organizational performance (H5), organizational innovation mediates the relationship between internal control and organizational performance (H6), technology capability significantly influences organizational innovation (H7), technology capability significantly influences organizational performance (H8), organizational innovation mediates the relationship between technology capability and organizational performance (H9), total quality management significantly influences organizational innovation (H10), total quality management significantly influences organizational performance (H11), organizational innovation mediates the relationship between total quality management and organizational performance (H12) and organizational innovation significantly influences organizational performance (H13).

Methodology

This study employs a quantitative cross-sectional survey design to examine the relationships among leadership, internal control, technology capability,

Total Quality Management, organizational innovation and organizational performance. The unit of analysis is the higher education institution as an organizational system. In this system, governance mechanisms shape knowledge sharing, service coordination and institutional processes across academic and administrative units. Primary data were collected through a structured questionnaire distributed to personnel working in Christian faith-based higher education institutions in Indonesia. Within this institutional context, governance practices and academic service delivery can be understood as organizational processes through which policies, information and academic services are coordinated among institutional actors and stakeholders.

To improve the reproducibility of the study, the empirical research design was organized into several sequential stages as shown in Figure 3.

First, the theoretical framework was developed by integrating the Resource-Based View, Educational Supply Chain Management and Integrated Tertiary Educational Supply Chain perspectives. Second, the constructs and measurement indicators were selected from previously validated studies and adapted to the context of Christian faith-based higher education institutions. Third, the questionnaire was prepared using a Likert-type scale and distributed to academic and administrative staff who were familiar with institutional governance, academic coordination and service delivery processes. Fourth, the collected responses were screened and coded before statistical analysis. Fifth, the measurement model was evaluated by examining outer loadings, Cronbach's Alpha, Composite Reliability, Average Variance Extracted and discriminant validity. Finally, the structural model was assessed using R^2 , Q^2 and bootstrapping with 5,000 subsamples to test the direct and mediating relationships among the constructs.

This research design presents the empirical research design and PLS-SEM analysis procedure used in this study. The figure shows the sequence from theoretical framework development and indicator adaptation to data collection, measurement model assessment, structural model testing and interpretation of the findings.

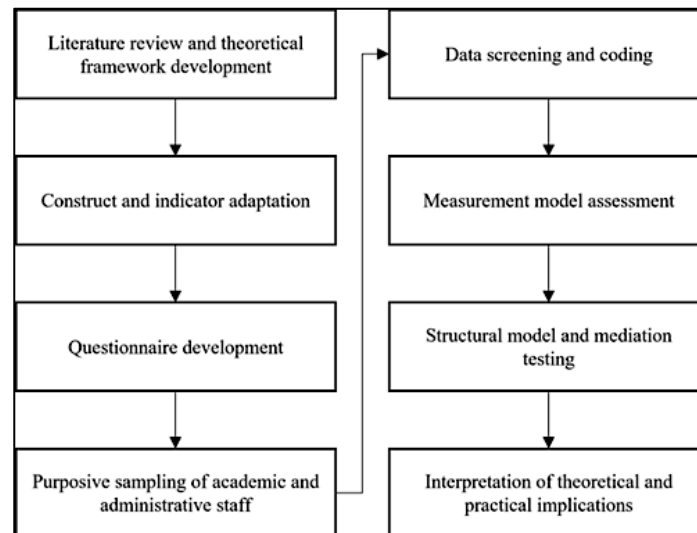


Figure 3: Empirical Research Design and PLS-SEM Analysis Procedure

All constructs were measured using previously validated measurement items adapted to the higher education context. The questionnaire consists of 30 measurement items, with five indicators representing each construct. Leadership was measured using items adapted from previous research (11, 12). Internal control and technology capability were measured using items adapted from prior studies (11, 13). Additional internal control indicators derived from previous study (14). TQM, organizational innovation and organizational performance were measured using indicators adapted from prior investigation (14). All responses were recorded using a Likert-type scale.

The study involved 213 respondents, consisting of academic staff, including lecturers and non-academic staff, including administrative and managerial personnel. These respondents represent institutional actors who are directly involved in academic coordination, governance practices and service delivery processes within higher education institutions. Purposive sampling was applied to select respondents who had relevant knowledge and experience in institutional management, academic coordination, governance practices, or organizational service processes. The sample size follows the commonly used rule-of-thumb of 5–10 respondents per indicator (30 indicators $\times$ 5–10) and the final sample of 213 responses satisfies the minimum requirement for Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis (15).

The inclusion and exclusion criteria were defined to ensure that the respondents were relevant to the

research objectives. Respondents were included if they met the following criteria:

- (a) they were academic or non-academic staff members working in Christian faith-based higher education institutions in Indonesia;
- (b) they had knowledge of, or involvement in, institutional governance, academic coordination, administrative services, quality management, or technology-supported institutional processes; and
- (c) they voluntarily agreed to participate in the study. Respondents were excluded if they were not affiliated with Christian faith-based higher education institutions, had no direct knowledge of institutional management or service delivery processes, submitted incomplete questionnaire responses, or provided inconsistent responses during data screening.

These criteria were applied to ensure that the collected data reflected informed perceptions of institutional governance, innovation and performance.

The data source of this study was primary survey data obtained directly from academic and non-academic staff members working in Christian faith-based higher education institutions in Indonesia. These respondents were selected because they were considered knowledgeable about institutional governance, academic coordination, administrative services, quality management, technology use and organizational performance within their institutions. The use of internal institutional respondents was appropriate because the constructs examined in this study relate to organizational processes that are experienced and

evaluated by personnel involved in daily academic and administrative activities.

Data reliability was strengthened through several procedures. First, the questionnaire items were adapted from previously validated studies and adjusted to the higher education context. Second, respondents were selected using purposive sampling to ensure that they had relevant institutional knowledge. Third, incomplete and inconsistent responses were screened before analysis. Fourth, statistical reliability was evaluated using Cronbach's Alpha and Composite Reliability, while convergent validity was assessed using Average Variance Extracted. The results

show that all retained constructs met the recommended reliability and validity thresholds, indicating that the data were adequate for PLS-SEM analysis.

After data collection, the responses were screened to ensure completeness and consistency. Incomplete responses and responses that did not meet the inclusion criteria were excluded from further analysis. The valid responses were then coded according to the measurement indicators for leadership, internal control, technological capability, Total Quality Management, organizational innovation and organizational performance.

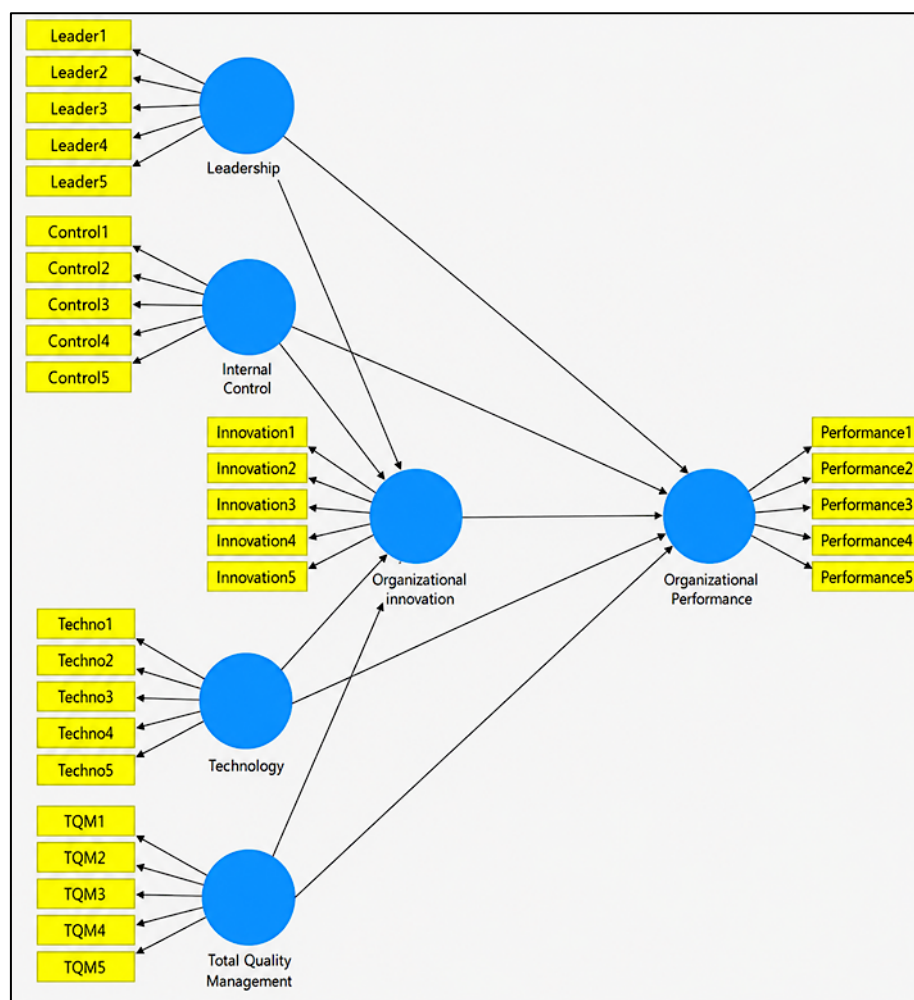


Figure 4: Conceptual Model

The data synthesis was conducted quantitatively through PLS-SEM. First, the measurement model was assessed to confirm indicator reliability, internal consistency reliability, convergent validity and discriminant validity. Second, the structural model was evaluated to examine the explanatory power, predictive relevance and significance of the hypothesized relationships. Third, the mediation

effects of organizational innovation were assessed through bootstrapping. This procedure enabled the study to synthesize respondent perceptions into empirical evidence regarding the relationships among governance capabilities, innovation and institutional performance.

Data were analyzed using PLS-SEM with SmartPLS because the research model is predictive in nature

and includes multiple direct and mediating relationships among constructs (15). The PLS algorithm was employed to evaluate both measurement and structural models. Indicator reliability was assessed through outer loadings, while internal consistency reliability was evaluated using Cronbach's Alpha (CA) and Composite Reliability (CR) with recommended thresholds of ≥ 0.70 . Convergent validity was assessed using Average Variance Extracted (AVE) with a minimum threshold of ≥ 0.50 . Discriminant validity was assessed using cross-loadings, ensuring that each indicator loads highest on its corresponding construct. Indicators that did not meet these criteria were removed from the analysis. The explanatory power of the structural model was evaluated using the coefficient of determination (R^2), while predictive relevance was assessed using the Stone-Geisser Q^2 statistic. Hypothesis testing was conducted through bootstrapping with 5,000 subsamples to estimate the significance of both direct and mediating relationships. Statistical significance was determined using p-values with a threshold of $p < 0.05$. The hypotheses tested in this study correspond to H1-H13 and are summarized in the conceptual model presented in Figure 4. This conceptual model summarizes the hypothesized relationships among leadership, internal control, technological capability, Total Quality Management, organizational innovation and organizational performance. The model also indicates the mediating role of organizational innovation in explaining how governance-related capabilities are translated into institutional

performance outcomes.

Results

As presented in Table 1, this study involved 213 respondents working in Christian faith-based higher education institutions across Indonesia. In terms of gender, most respondents were male (155 respondents; 72.77%), while 58 respondents were female (27.23%). The participants consisted of both academic staff (lecturers) and non-academic personnel, including administrative and managerial staff involved in institutional management and academic service coordination.

Regarding geographical distribution, the largest proportion of respondents were from Jakarta (64; 30.05%), followed by Central Java (37; 17.37%), North Sumatra (25; 11.74%) and West Jakarta (24; 11.27%). Additional respondents were located across several provinces including Yogyakarta, Lampung, East Java, Papua, Banten, North Sulawesi and East Nusa Tenggara. This distribution indicates that the sample represents higher education institutions across multiple regions in Indonesia.

In terms of institutional experience, most respondents reported more than ten years of working experience (98; 46.01%), followed by respondents with less than five years of experience (58; 27.23%) and those with five to ten years of experience (57; 26.76%). The relatively high proportion of experienced respondents suggests that the collected data reflects perspectives from individuals who possess substantial institutional knowledge and familiarity with governance and academic coordination processes.

Table 1: Sociodemographic of Participants

Profile		Freq	Percentage (%)
Gender	Female	58	27.23
	Male	155	72.77
Employment Status	Academic Staff (Lecturers)	189	88.73
	Non-academic Staff	24	11.27
Workplace Location	Jakarta	64	30.05
	Central Java	37	17.37
	North Sumatera	25	11.74
	West Jakarta	24	11.27
	Yogyakarta	14	6.57
	Lampung	10	4.69
	East Java	8	3.76
	Papua	8	3.76
	Banten	6	2.82
	North Sulawesi	6	2.82
	East Nusa Tenggara	4	1.88
	Others	7	3.29
Working experience	Less than 5 years	58	27.23
	5-10 years	57	26.76
	More than 10 years	98	46.01

The sociodemographic information summarizes the sociodemographic profile of the respondents. The table indicates that most respondents were academic staff and had substantial institutional experience. This profile is relevant to the study because experienced academic and administrative personnel are more likely to understand governance practices, academic coordination, technology use, quality management and service delivery processes within higher education institutions.

The measurement model as shown in Table 2 was evaluated to assess indicator reliability, internal consistency reliability and convergent validity of the constructs included in the research model. The results indicate that all retained indicators exhibit outer loading values ranging from 0.729 to 0.926, which exceed the recommended threshold of 0.70 (15). These results demonstrate that the measurement indicators adequately represent the constructs of leadership, internal control, technology capability, TQM, organizational innovation and organizational performance.

Internal consistency reliability was also confirmed,

with Cronbach's Alpha values ranging from 0.811 to 0.927 and Composite Reliability values between 0.874 and 0.945. These values exceed the recommended threshold of 0.70, indicating satisfactory reliability of the measurement constructs. In addition, AVE values range from 0.635 to 0.776, which exceed the recommended minimum value of 0.50. These findings confirm that the constructs demonstrate adequate convergent validity.

Overall, the measurement model results indicate that the retained indicators reliably represent the governance-related capabilities and organizational outcomes examined in this study. Therefore, the measurement model meets the reliability and validity requirements necessary for further structural model analysis.

The measurement model assessment show that the retained indicators meet the recommended thresholds for indicator reliability, internal consistency reliability and convergent validity. Therefore, the constructs used in the study are considered reliable and valid for further structural model analysis.

Table 2: PLS-algorithm

Construct	Item	OL	CA	CR	AVE
Internal Control	Control1	0.815	0.811	0.874	0.635
	Control2	0.789			
	Control3	0.729			
	Control4	0.848			
Organizational innovation	Innovation1	0.841	0.927	0.945	0.776
	Innovation2	0.926			
	Innovation3	0.914			
	Innovation4	0.828			
	Innovation5	0.891			
Leadership	Leader3	0.842	0.82	0.892	0.733
	Leader4	0.867			
	Leader5	0.859			
Organizational Performance	Performance1	0.846	0.90	0.927	0.717
	Performance2	0.909			
	Performance3	0.811			
	Performance4	0.890			
	Performance5	0.769			
Total Quality Management	TQM1	0.849	0.924	0.943	0.768
	TQM2	0.817			
	TQM3	0.848			
	TQM4	0.851			
	TQM5	0.841			
Technology capability	Techno1	0.820	0.924	0.943	0.768
	Techno2	0.890			
	Techno3	0.874			
	Techno4	0.909			
	Techno5	0.887			

Note: OL = Original sample; CA = Cronbach's alpha; CR = Composite reliability; AVE = Average variance extracted.

The coefficient of determination in Table 3 was examined to evaluate the explanatory power of the

structural model. The results indicate that organizational innovation has an R^2 value of 0.685,

suggesting that leadership, internal control, technology capability and Total Quality Management collectively explain 68.5% of the variance in organizational innovation. Meanwhile, organizational performance has an R^2 value of 0.706, indicating that organizational innovation together with the governance-related variables

explain 70.6% of the variance in organizational performance. According to commonly accepted PLS-SEM evaluation criteria, these values indicate substantial explanatory power of the model in explaining innovation and performance outcomes within higher education institutions.

Table 3: Coefficient of Determination

Construct	R-Square
Organizational Performance	0.706
Organizational innovation	0.685

The R^2 value for organizational innovation indicates that leadership, internal control, technological capability and Total Quality Management explain a substantial proportion of its variance. The R^2 value for organizational performance also shows that the model has strong explanatory power in explaining institutional performance through governance-related capabilities and organizational innovation.

Predictive relevance was assessed using the blindfolding procedure. The Q^2 value in Table 4 for

organizational performance is 0.480, while the Q^2 value for organizational innovation is 0.505. Since both values exceed zero, the results indicate that the structural model demonstrates adequate predictive relevance for the endogenous constructs. These findings suggest that the governance mechanisms examined in this study provide meaningful predictive capability in explaining variations in organizational innovation and institutional performance within higher education institutions.

Table 4: Predictive Relevance

Construct	SSO	SSE	Q^2
Organizational Performance	1065	553.843	0.480
Organizational innovation	1065	527.506	0.505

Note: SSO = Sum of Squared Observations; SSE = Sum of Squared Errors; Q^2 = Q-square (Stone-Geisser's Predictive Relevance).

The predictive relevance of the model using the Q^2 statistic. Since the Q^2 values for organizational innovation and organizational performance are greater than zero, the model demonstrates predictive relevance for both endogenous constructs. This means that the proposed model is not only explanatory but also has predictive capability in the context of faith-based higher education institutions.

Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS by examining path coefficients, t-statistics and p-values. A hypothesis is considered supported when the p-value is below 0.05. The results in Table 5 show that leadership does not significantly influence organizational innovation (H1) or organizational performance (H2). Similarly, organizational innovation does not mediate the relationship between leadership and organizational performance (H3). These findings suggest that leadership practices alone may not directly translate into measurable improvements in innovation capability or institutional performance.

Likewise, internal control does not significantly influence organizational innovation (H4) or organizational performance (H5) and the mediating effect of organizational innovation between internal control and performance (H6) is not supported.

In contrast, technology capability significantly influences organizational innovation (H7 supported). However, technology does not directly influence organizational performance (H8 not supported). The results show that organizational innovation mediates the relationship between technology and organizational performance (H9 supported).

Similarly, Total Quality Management significantly influences organizational innovation (H10 supported) but does not directly influence organizational performance (H11 not supported). Organizational innovation significantly mediates the relationship between TQM and organizational performance (H12 supported).

Finally, organizational innovation has a strong positive influence on organizational performance

(H13 supported), indicating that innovation plays an important role in translating managerial

capabilities and institutional resources into improved organizational outcomes.

Table 5: Path Coefficients

Hypothesis	OS	STDEV	t Statistics	p-value	Decision
H1	-0.042	0.084	0.496	0.620	NS
H2	-0.016	0.069	0.230	0.818	NS
H3	-0.029	0.062	0.474	0.636	NS
H4	0.116	0.117	0.989	0.323	NS
H5	-0.091	0.102	0.896	0.371	NS
H6	0.081	0.079	1.022	0.307	NS
H7	0.251	0.083	3.019	0.003	S
H8	0.035	0.090	0.392	0.695	NS
H9	0.176	0.081	2.176	0.030	S
H10	0.561	0.086	6.536	0.000	S
H11	0.213	0.140	1.525	0.128	NS
H12	0.393	0.108	3.656	0.000	S
H13	0.701	0.169	4.150	0.000	S

Note: OS=Original sample; STDEV=Standard Deviation; NS=Not Supported; S=Supported.

The results show that technological capability and Total Quality Management significantly influence organizational innovation, while organizational innovation significantly influences organizational performance. The table also indicates that organizational innovation mediates the effects of technological capability and Total Quality Management on organizational performance. These results support the central argument that institutional capabilities improve performance mainly when they are transformed into innovation outcomes.

Discussion

The findings indicate that leadership does not significantly influence organizational innovation or organizational performance. These results suggest that leadership practices in the sampled institutions may not yet be sufficiently translated into operational mechanisms that support innovation and institutional performance. Although leadership behaviors such as communicating institutional vision, encouraging new perspectives and emphasizing ethical values resemble transformational leadership characteristics commonly associated with innovation (16, 17), these practices may remain symbolic rather than operational within institutional management processes.

In many Indonesian higher education institutions, leadership structures tend to be centralized, which may limit collaborative decision-making and reduce opportunities for cross-unit coordination (4). Consequently, leadership vision may not

necessarily translate into institutional innovation unless it is supported by operational systems that facilitate collaboration and knowledge sharing.

Faith-based institutions may also experience additional complexities in balancing religious values with technological adoption and institutional transformation (6, 18). While these values strengthen institutional identity and ethical governance, innovation outcomes may depend more strongly on operational capabilities such as digital infrastructure and standardized management processes that enable effective collaboration across institutional units.

The results show that internal control does not significantly influence organizational innovation or institutional performance. This finding suggests that internal control mechanisms within the sampled institutions may primarily function as administrative compliance systems rather than as managerial tools that facilitate organizational learning and innovation.

Internal control systems are typically designed to enhance transparency, accountability and monitoring within organizational processes (19–21). However, their effectiveness depends on how these mechanisms are integrated into institutional governance structures and decision-making processes (22).

In many universities, internal control practices focus mainly on compliance and reporting requirements rather than on improving institutional coordination and knowledge sharing. When internal control systems emphasize monitoring activities rather than institutional

learning, they may limit organizational flexibility and reduce opportunities for innovation (23). As a result, internal control mechanisms may have limited influence on innovation capability and institutional performance unless they are integrated with broader governance practices that encourage knowledge sharing and collaborative decision-making.

The findings demonstrate that technology capability significantly supports organizational innovation but does not directly improve institutional performance. These results suggest that technological capability primarily strengthens innovation processes rather than immediately generating measurable performance outcomes.

Digital technologies such as learning management systems, academic information systems and digital learning platforms enable universities to improve collaboration, communication and knowledge sharing among institutional actors (24, 25). Through these digital infrastructures, universities can develop new teaching models, digital learning environments and innovative administrative practices.

However, technological investments alone may not directly improve organizational performance. Many universities remain in early stages of digital transformation where technological systems are implemented as isolated initiatives rather than as integrated institutional platforms (25, 26). When technological capability is combined with innovation processes that transform knowledge resources into improved academic and administrative practices, it can contribute to stronger institutional outcomes (27–30). The results indicate that Total Quality Management significantly strengthens organizational innovation but does not directly influence organizational performance. These findings suggest that quality management practices contribute to institutional performance primarily through their influence on innovation processes. TQM emphasizes continuous improvement, standardized procedures and systematic evaluation of organizational processes. In higher education institutions, quality assurance systems, accreditation processes and academic evaluation mechanisms represent practical applications of TQM principles (31, 32). However, in many universities, quality management practices are implemented primarily as compliance-oriented

procedures rather than as strategic tools for institutional development (33, 34). When quality management systems facilitate institutional learning and continuous improvement, they can stimulate innovation in governance practices, teaching methods and academic services (35, 36). Through these innovation processes, improvements in quality management can eventually enhance institutional performance and competitiveness (37, 38).

The results confirm that organizational innovation significantly improves organizational performance. This finding highlights the central role of innovation in translating managerial capabilities and institutional resources into measurable institutional outcomes. Organizational innovation enables universities to introduce new teaching methods, digital learning systems, administrative practices and governance mechanisms that enhance institutional effectiveness (1, 39). Through these innovations, universities can strengthen institutional routines, enhance knowledge sharing and improve academic and administrative service quality. Previous studies also demonstrate that innovation contributes to organizational performance by strengthening knowledge management, organizational learning and quality management practices within institutional environments (6, 35, 37, 40). These findings indicate that innovation functions as a key mechanism through which governance capabilities and institutional resources are transformed into improved organizational performance.

The findings further emphasize the importance of knowledge sharing processes within higher education institutions. Innovation emerges when institutional actors exchange knowledge, collaborate across organizational units and integrate diverse expertise into institutional decision-making processes. Higher education institutions involve multiple actors including academic staff, administrators and institutional leaders who possess diverse forms of knowledge related to teaching, governance and technological development. When these knowledge resources are effectively exchanged through communication networks and organizational collaboration, they gradually develop into collective institutional capabilities that support innovation. Through continuous communication and interaction, distributed knowledge resources can gradually

converge into shared institutional understanding. Digital infrastructures and governance mechanisms facilitate these knowledge exchanges by improving information accessibility and institutional coordination. As a result, universities can transform dispersed expertise into coordinated innovation outcomes that strengthen institutional performance (35, 37).

Conclusion

This study examined how leadership, internal control, technology capability and TQM influence organizational innovation and organizational performance in Christian faith-based higher education institutions in Indonesia. The findings reveal that technology capability and TQM significantly strengthen organizational innovation, whereas leadership and internal control do not directly influence innovation or performance outcomes. Furthermore, organizational innovation plays a crucial mediating role, particularly in translating technological capability and quality management practices into improved institutional performance. These results indicate that innovation functions as a key organizational mechanism through which universities transform managerial capabilities and institutional resources into improved performance outcomes. Technological infrastructures and quality-oriented governance enable institutions to enhance coordination, knowledge sharing and service delivery across academic and administrative units. Consequently, innovation emerges as the primary pathway through which managerial practices and institutional capabilities contribute to the performance of faith-based higher education institutions.

This study has several limitations that should be acknowledged. First, the research employed a cross-sectional design, which limits the ability to capture dynamic changes in governance practices and innovation processes over time. Longitudinal studies would provide deeper insights into how managerial capabilities evolve and influence institutional outcomes in higher education. Second, the data were collected using self-reported questionnaires from academic and administrative staff. Although this approach captures internal organizational perceptions, future studies may combine survey data with objective institutional indicators such as accreditation performance,

digital system utilization, or service delivery metrics. Third, this research focuses specifically on Christian religious higher education institutions in Indonesia. While this context provides valuable insights into value-driven institutional governance, future studies could compare faith-based, public and private universities to examine how institutional characteristics influence innovation and performance dynamics.

This study contributes to higher education management literature by integrating governance mechanisms, technological capability and quality management within a unified framework explaining innovation-driven performance. The findings support the resource-based view by demonstrating that institutional capabilities—particularly technology infrastructure and quality-oriented governance—serve as strategic resources that enhance innovation and performance in knowledge-intensive organizations. Furthermore, the study extends existing research by showing that innovation acts as a critical mechanism that converts managerial capabilities into measurable institutional outcomes. Rather than directly improving performance, managerial practices influence performance primarily through innovation processes that enhance organizational learning and service effectiveness.

From a managerial perspective, the findings suggest that university leaders should prioritize investments in technological infrastructure and quality management systems that facilitate institutional coordination and knowledge sharing. Digital platforms, learning management systems and integrated information systems can enhance collaboration among academic and administrative units and support innovation in teaching, governance and service delivery. In addition, quality management practices should be implemented not merely as compliance mechanisms but as continuous improvement systems that promote organizational learning and innovation. By strengthening technological capability and quality governance, faith-based universities can enhance their ability to generate innovation and improve institutional performance.

Practical Implications

The findings offer several practical implications for leaders and managers of faith-based higher education institutions. First, technological capability should be developed as an integrated

institutional infrastructure rather than as a set of isolated digital tools. Learning management systems, academic information systems and digital communication platforms need to relate to academic coordination, administrative services and decision-making processes. Second, Total Quality Management should be implemented not only as an accreditation or compliance requirement but also as a continuous improvement mechanism that encourages institutional learning. Third, university leaders should create organizational conditions that enable technology and quality management practices to generate innovation in teaching, governance and service delivery. These implications suggest that institutional performance can be strengthened when technological and quality-oriented capabilities are deliberately transformed into innovation-oriented practices.

Future Research Directions

Future studies may extend this research in several ways. First, longitudinal research is needed to examine how governance capabilities, technological capability, quality management and organizational innovation develop over time. Second, future research may combine survey data with objective institutional indicators, such as accreditation results, digital platform utilization, student service performance, or research productivity. Third, comparative studies involving faith-based, public and private higher education institutions would provide deeper insight into how different institutional characteristics shape innovation and performance. Fourth, future studies may also examine additional mediating or moderating variables, such as organizational culture, knowledge sharing, digital readiness, or institutional trust, to provide a more comprehensive explanation of innovation-driven performance in higher education institutions.

Abbreviations

AVE: Average Variance Extracted, CA: Cronbach's Alpha, CR: Composite Reliability, ESCM: Educational Supply Chain Management, PLS-SEM: Partial Least Squares Structural Equation Modeling, RBV: Resource-Based View, TQM: Total Quality Management.

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Author Contributions

All authors contributed significantly to the conception, development and preparation of this manuscript.

Conflicts of Interest

The authors declare that they have no competing interests.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Artificial Intelligence (AI) Assistance

During the preparation of this work, the authors used ChatGPT-4 (OpenAI) to improve the clarity and readability of the manuscript and to generate initial ideas for the literature review structure. All AI-generated content was thoroughly reviewed, revised and verified by the authors.

Ethics Approval

Participation in this study was voluntary and informed consent was obtained from all respondents prior to data collection. The survey instrument and research procedure were reviewed and approved by the dissertation supervisor and co-supervisor at Universitas Negeri Jakarta. In addition, the research concept and survey design were formally approved during the doctoral dissertation proposal examination conducted by the dissertation committee and supervisors at Universitas Negeri Jakarta for the 2026 dissertation research period. The study was conducted in accordance with institutional research guidelines and ethical standards.

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