

Advancing Administrative Service Quality in Higher Education: An Integrated Model of Digital Competence, Organizational Capability, Career Path Clarity, Cross-Unit Collaboration, and Administrative Process Effectiveness

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ABSTRACT

This study formulates a comprehensive strategic model for improving the quality of educational personnel at the University of Riau by integrating quantitative and qualitative approaches. Using a census of 484 administrative staff and semi-structured interviews with key institutional leaders, the research employs Partial Least Squares–Structural Equation Modeling (PLS-SEM) to examine the influence of digital competence, organizational capability, career path clarity, and cross-unit collaboration on administrative service quality, with administrative process effectiveness as a moderating variable. The results reveal that all exogenous variables significantly and positively affect service quality, with organizational capability and administrative process effectiveness being the strongest determinants. Qualitative findings further validate the importance of digital literacy enhancement, structural coordination, and competency-based career systems in strengthening human resource performance. This study provides an integrated and empirically tested model that contributes to the literature on non-academic human resource development in Indonesian higher education and offers actionable strategies for institutional transformation toward efficient, transparent, and user-oriented administrative services.

Keywords: Administrative Services, Digital Competence, Organizational Capability, Career Pathways, Educational Personnel, PLS-SEM, Higher Education Management

INTRODUCTION

Higher education institutions worldwide are undergoing a rapid digital transformation that extends beyond online teaching to encompass administrative processes, data governance, and institutional strategy. National policymakers and international agencies increasingly frame digitalization as a core pillar of higher-education modernization, urging universities to adopt integrated academic information systems, learning management platforms, and data-driven decision-making to improve service delivery and accountability. Such policy momentum has been particularly visible in Indonesia, where government initiatives and programmatic guidance have accelerated campus-level digital adoption.

Despite clear policy signals and technological availability, large variation exists in how well universities convert digital investments into improved administrative performance. Cross-country reviews of institutional guidance on organizational digital capability show that success depends less on technology per se and more on an institution's ability to align structure, leadership and processes to support digital workstreams. In other words, digital tools create potential, but organizational capability determines whether that potential is realized.

At the micro level, digital competence among non-academic staff defined as technical skills, data management capacity, information-security awareness, and adaptive attitudes remains uneven. Recent systematic reviews

indicate that while many university staff can operate basic digital tools, the uptake of more advanced data practices and AI-augmented workflows is limited by insufficient training, time constraints, and resource gaps. This gap in advanced digital competence constrains the institutional ability to fully automate and streamline administrative workflows.

A complementary barrier is the persistence of siloed organizational practices and unclear career structures for administrative personnel. Empirical studies and practitioner reports show that when career paths, competency frameworks, and promotion mechanisms are opaque, staff motivation and internal mobility decline, reducing incentives for upskilling and cross-unit collaboration. Therefore, interventions that focus solely on training without simultaneous organizational design and career governance are unlikely to produce sustainable performance gains.

Another contemporary phenomenon shaping university administration is the accelerating adoption of generative AI and automation tools in routine tasks from document processing to service chatbots. While these technologies promise efficiency gains, they also widen the implementation gap: institutions that lack robust data governance, staff digital literacy, and change-management capacity often underutilize or misapply AI, thereby risking inefficiencies and ethical issues. The literature thus emphasizes responsible AI deployment embedded within broader capability-building programs rather than as an isolated technology project.

The national context amplifies these global trends. In Indonesia, digitalization efforts have been accompanied by persistent digital divides between urban and regional campuses and between younger and more senior staff; such inequalities affect both access to reliable connectivity and participation in professional development programs. Policy briefs and country analyses highlight that bridging these divides is essential if digital transformation is to translate into more equitable and effective administrative services across the higher-education landscape.

Empirical research increasingly points to administrative process effectiveness measured by process cycle time, error rates, and digital documentation coverage as a central mediator between institutional inputs (competence, capability, career clarity, collaboration) and observed service quality. That is, well-designed and digital-supported processes amplify the effects of staff skills and organizational reforms; conversely, poor processes dampen the benefits of training and structural changes. This emergent consensus suggests that process redesign must be a priority alongside human-capacity interventions.

For universities aiming to improve administrative service quality, a multi-level approach is therefore required: (1) strengthen individual digital competencies with targeted, role-based training; (2) build organizational capability through participatory leadership, integrated information systems, and coordination mechanisms; (3) clarify career pathways to motivate and retain administrative talent; and (4) redesign and digitally enable core administrative processes so they can act as force-multipliers for other reforms. Studies and policy reviews indicate that piecemeal initiatives rarely succeed unless these components are integrated within a coherent change program.

Against this backdrop, the present study responds to a pressing practical and scholarly need: to empirically examine how digital competence, organizational capability, career-path clarity, and cross-unit collaboration interact directly and through administrative process effectiveness to determine administrative service quality in an Indonesian public university. By combining a census-based quantitative analysis with qualitative institutional inquiry, the research generates both generalizable evidence and contextualized strategies that universities can adopt to convert digitalization into measurable improvements in administrative service delivery.

LITERATURE REVIEW

Digital Competence of Educational Personnel

Digital competence among educational personnel is increasingly recognized as a multidimensional construct that encompasses technical skills, cognitive capabilities, and attitudinal readiness. Scholars argue that digital competence extends far beyond basic computer literacy; it includes the ability to manage data, evaluate digital information critically, understand cybersecurity principles, and leverage digital platforms to optimize administrative tasks. Recent frameworks such as DigCompEdu position digital competence as integral to effective educational governance, noting its role in supporting data-driven decision-making and improving public-sector accountability.

The relevance of digital competence in higher education administration has intensified following the widespread adoption of integrated academic information systems, digital archives, e-office tools, and cloud-based document management platforms. While many universities have adopted such systems, the success of implementation depends heavily on the staff's ability to use them efficiently. Studies consistently reveal that staff who demonstrate higher digital proficiency contribute to faster service delivery, fewer administrative errors, and more transparent workflows. However, gaps remain, particularly among older staff members and units with limited digital exposure.

Global reviews on digital transformation show that staff digital competence also plays a critical role in shaping institutional readiness for technological innovation. Universities with competent administrative personnel can more easily integrate automation tools, analytics dashboards, and AI-assisted workflows. Conversely, institutions with low digital readiness often struggle to benefit from digital investments, resulting in underutilized systems and resistance to change. This digital divide underscores the need for structured, continuous training and competency-based development policies.

In emerging economies such as Indonesia, digital competence is further shaped by contextual constraints, including infrastructure disparities, inconsistent access to training, and administrative cultures that traditionally rely on manual procedures. Thus, the development of digital competence among educational personnel must be viewed not only as a skill-building initiative but also as part of broader organizational change that aligns individual capabilities with institutional strategy and national digitalization policies.

Organizational Capability

Organizational capability refers to an institution's ability to coordinate structures, processes, leadership, and resources to achieve strategic goals. In the context of higher education, organizational capability becomes particularly important as universities face pressures to adopt digital technologies, enhance transparency, and deliver efficient administrative services. Scholars emphasize that strong organizational capability is characterized by adaptive structures, participatory decision-making, and a supportive institutional culture that encourages innovation and collaboration.

Higher education institutions with strong organizational capability tend to exhibit integrated information systems, flexible inter-unit coordination mechanisms, and leadership styles that foster digital transformation. These institutions are able to respond proactively to environmental changes, including shifts in government policy, technological disruptions, and evolving user expectations. Research shows that universities with agile organizational systems are more capable of embedding new technologies into everyday administrative operations, reducing bureaucratic delays and improving institutional responsiveness.

Organizational capability also depends on internal processes that encourage continuous learning and evaluation. Data-driven decision-making, performance monitoring, and systematic feedback loops allow institutions to identify inefficiencies and improve administrative procedures. Organizational learning theories affirm that institutions with strong capability are not static; instead, they adjust strategies based on empirical evidence and stakeholder needs. This dynamic approach strengthens institutional resilience and supports long-term development.

In Indonesia, organizational capability challenges are often compounded by hierarchical structures, fragmented communication channels, and varying levels of autonomy across faculties and administrative bureaus. Therefore, strengthening organizational capability involves not only improving physical infrastructure or digital systems but also transforming governance practices, promoting collaborative work cultures, and ensuring alignment between leadership directives and operational realities.

Clarity of Career Path

Career path clarity refers to the degree to which employees understand the progression opportunities, competency requirements, promotion mechanisms, and long-term development pathways within an organization. In higher education administration, well-defined career paths are essential for motivating administrative staff, enhancing job satisfaction, and supporting professional identity formation. Scholars note that clarity reduces ambiguity, mitigates frustration, and fosters engagement, especially in complex bureaucratic environments.

When career pathways are unclear, staff may perceive limited future prospects, resulting in decreased motivation and lower performance. This problem is common in universities where non-academic roles evolve rapidly due to digital transformation, yet competency standards and promotion criteria have not been updated accordingly. Research indicates that unclear job expectations and inconsistent promotion policies contribute to stagnation and disengagement, weakening institutional capacity to retain skilled administrative personnel.

Conversely, institutions that invest in career-mapping tools, competency frameworks, and structured mentoring programs tend to experience higher productivity and stronger organizational commitment among staff. Transparent career systems also support equity, ensuring that promotions are based on performance and skills rather than informal networks. This is increasingly important in public-sector settings where accountability and fairness are closely scrutinized.

In Indonesia's higher education sector, issues of career clarity are frequently linked to inconsistent guidelines, limited training budgets, and slow standardization across faculties. As a result, many educational personnel report uncertainty regarding advancement criteria, required competencies, and opportunities for cross-unit mobility. Addressing these gaps requires institutional reforms that align HR policies with performance indicators and digital demands, ensuring that career development becomes an integral component of organizational strategy.

Cross-Unit Collaboration

Cross-unit collaboration refers to the cooperative interaction between departments, faculties, and administrative bureaus aimed at achieving shared institutional goals. In universities, where academic and administrative functions are often distributed across diverse units, collaborative mechanisms play an essential role in enhancing service integration, reducing duplication, and supporting innovation. Literature on organizational behavior highlights that effective collaboration fosters coherence in policy implementation and improves institutional agility.

Higher education institutions with strong cross-unit collaboration typically use joint task forces, digital collaboration platforms, and cross-functional committees to coordinate administrative processes. These mechanisms enable units to share data, align workflows, and address problems collectively rather than in isolation. Studies show that collaboration reduces bureaucratic silos, supports digital integration, and accelerates administrative innovation, especially in large public universities.

However, collaborative practices are often hindered by structural fragmentation, competing priorities, and communication barriers between units. Research suggests that without clear coordination systems, even technologically advanced institutions may experience inefficiencies such as duplicated tasks, inconsistent data, and conflicting administrative decisions. Therefore, fostering collaboration requires deliberate leadership support, shared goals, and systems that encourage interdependence rather than separation.

In the Indonesian context, cross-unit collaboration remains a challenge due to hierarchical structures and varying levels of digital readiness across campuses. While faculties may coordinate well internally, collaboration across central bureaus is often limited. Enhancing collaboration thus requires cultural change, institutional incentives, and digital platforms that facilitate real-time coordination and transparency across work units.

Administrative Process Effectiveness

Administrative process effectiveness is defined as the extent to which administrative procedures achieve institutional goals efficiently, accurately, and transparently. Indicators often include processing time, error rates, workflow integration, digitalization levels, and user satisfaction. Research in public-sector management shows that effective processes serve as the backbone of administrative performance, enabling institutions to deliver consistent and timely services.

Recent studies highlight that digitalization plays a central role in improving administrative process effectiveness. Automated workflows, digital documentation systems, and integrated databases reduce manual workload, minimize human errors, and facilitate real-time access to information. Effective digital processes also support compliance and accountability, ensuring that administrative activities align with institutional policy and national regulatory frameworks.

Administrative effectiveness is also shaped by staff competence and organizational capability. Even the most advanced digital systems cannot function optimally without personnel who understand how to use them and without organizational structures that support process integration. Scholars emphasize that workflow redesign, capacity building, and system audits are necessary to achieve sustainable improvements rather than temporary efficiency gains.

In Indonesian universities, administrative processes are undergoing rapid reform as institutions shift from paper-based procedures to fully digitalized systems. However, adoption remains uneven, with some units achieving high levels of digitalization while others rely on manual processes. This inconsistency affects overall service quality and highlights the need for standardized SOPs, continuous training, and strong leadership to ensure that digitalization translates into operational effectiveness.

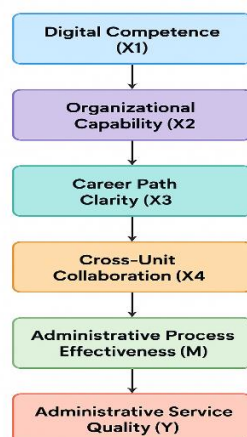


Figure 1. Conceptual Framework

METHODOLOGY

Research Design

This study employed a mixed-method approach integrating quantitative and qualitative strategies to generate comprehensive and robust insights into the factors that influence administrative service quality in higher education. The quantitative component used a cross-sectional survey design, allowing the researchers to measure perceptions of digital competence, organizational capability, career path clarity, cross-unit collaboration, administrative process effectiveness, and service quality among educational personnel at a single point in time. This design is appropriate for examining structural relationships between variables and testing theoretically grounded models using multivariate analysis.

The qualitative component complemented the quantitative findings by providing deeper contextual understanding of organizational practices, challenges, and institutional dynamics that cannot be fully captured through survey data alone. Through interviews, observations, and document review, the study explored nuanced factors influencing administrative processes, leadership practices, and employee experiences. The combination of quantitative and qualitative approaches enhances the study's explanatory power and strengthens the validity of its conclusions.

Using a mixed-method design also aligns with contemporary higher education research, which increasingly recognizes the importance of integrating numerical analysis with contextual insights to understand complex organizational phenomena. This approach allows for triangulation, where findings from one method validate or deepen insights obtained from another. Thus, the selection of a mixed-method design ensures that the study captures both measurable patterns and rich narratives related to administrative service quality.

Population and Sample

The population of this study consisted of all educational personnel employed at the University of Riau, totaling 484 individuals across various faculties, administrative bureaus, and institutional units. Given the manageable population size and the need for robust statistical power in the structural model, the study adopted a census sampling approach for the quantitative component. This means that all members of the target population were invited to participate, ensuring comprehensive coverage and eliminating sampling bias.

Census-based sampling is considered highly appropriate when the population size is relatively small and homogeneous in its characteristics, particularly in organizational studies. It enhances the accuracy of parameter estimates and provides a more precise reflection of the institutional conditions under investigation. Moreover, by involving the entire administrative workforce, the study captures diverse perspectives across hierarchical levels and operational areas within the university.

For the qualitative component, purposive sampling was used to select key informants with strategic roles and in-depth knowledge of administrative processes. These included heads of bureaus, division leaders, senior staff, and personnel involved in digital transformation initiatives. Purposive sampling ensures that information-rich cases are prioritized, allowing the researchers to explore organizational practices and challenges from the perspectives of those most directly involved. This dual sampling strategy ensures that the overall study benefits from broad representativeness as well as deep organizational insights.

Table 1. Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	182	37.6
	Female	302	62.4
Age	< 30 years	54	11.2
	31–40 years	168	34.7
	41–50 years	156	32.2
	> 50 years	106	21.9
Education	High school	48	9.9
	Diploma/Bachelor	346	71.5
	Postgraduate	90	18.6
Tenure	< 5 years	62	12.8
	5–10 years	174	36.0
	> 10 years	248	51.2

Data Collection Procedures

Quantitative data were collected using structured questionnaires distributed both in digital and printed formats to ensure accessibility for all personnel. The instrument was disseminated over a defined period, and respondents

were assured of confidentiality and anonymity to encourage honest and accurate responses. The data collection process was monitored closely to ensure a high response rate and to reduce potential biases associated with non-responses.

The qualitative data collection involved semi-structured interviews conducted with selected key informants. Interviews were carried out face-to-face and online, depending on the informants' availability and institutional COVID-19 protocols. Each interview lasted between 45 and 90 minutes and was recorded with participant consent to ensure the accuracy of transcription and subsequent analysis. Observations of administrative processes and reviews of institutional documents supported the interview findings, enabling triangulation and enhancing data credibility.

Ethical considerations were observed throughout the data collection process. Participants were informed about the purpose of the research, voluntary participation, and their right to withdraw at any time. All data were stored securely and used solely for academic purposes. The combination of multiple data collection methods strengthens the validity of the findings by capturing both empirical trends and contextual dynamics within the university.

Measurement and Instruments

The quantitative questionnaire comprised validated items adapted from previous studies on digital competence, organizational capability, career development, collaboration, and service quality in higher education and public-sector contexts. Each construct was measured using multiple indicators on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The use of established measurement scales enhances the reliability and comparability of findings.

Digital competence items assessed respondents' proficiency in using digital tools, managing digital information, and adapting to technology-driven administrative tasks. Organizational capability was measured through indicators related to structural coordination, leadership support, and institutional agility. Career path clarity items captured perceptions of promotion mechanisms, competency requirements, and professional development opportunities, while collaboration indicators evaluated the extent of communication and coordination between administrative units.

Administrative process effectiveness was measured through indicators of timeliness, accuracy, transparency, and digital workflow integration. Meanwhile, service quality included reliability, responsiveness, and user satisfaction metrics. All items were pilot-tested prior to full deployment to ensure clarity and contextual relevance. Minor revisions were made based on feedback from the pilot phase to improve the instrument's readability and precision.

Data Analysis Methods

Quantitative data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with SmartPLS 4. PLS-SEM is widely recommended for predictive modeling and theory development, particularly when research involves complex models with multiple latent variables and moderating effects. It is also suitable for studies with non-normal data distributions, which are common in organizational research.

The analysis proceeded in two major stages: measurement model evaluation and structural model evaluation. The measurement model assessed the validity and reliability of the constructs, including convergent validity, discriminant validity, internal consistency, and indicator loadings. Once the measurement criteria were met, the structural model was evaluated to examine path coefficients, effect sizes, and the overall explanatory power (R^2) of the proposed model.

For the qualitative data, thematic analysis was employed to identify key themes and patterns that emerged from interviews, observations, and documents. Transcripts were coded inductively and deductively to align with both the theoretical framework and emergent institutional insights. NVivo software supported the coding process and improved the rigor of qualitative interpretation. Integration of quantitative and qualitative findings occurred during the interpretation stage to produce a comprehensive understanding of institutional dynamics.

Validity and Reliability

The validity and reliability of the quantitative measures were rigorously assessed following established SEM guidelines. Convergent validity was confirmed through high outer loadings and Average Variance Extracted (AVE) values exceeding the recommended threshold of 0.50. Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT), ensuring that each construct measured a distinct theoretical domain.

Internal consistency reliability was evaluated through Cronbach's Alpha and Composite Reliability values, both of which exceeded recommended standards, indicating strong reliability across constructs. Multicollinearity

diagnostics showed no serious collinearity issues, ensuring that the structural paths could be interpreted accurately. Bootstrapping with 5,000 resamples was used to test the significance of path coefficients.

In the qualitative component, credibility was strengthened through triangulation across interviews, observations, and institutional documents. Member-checking was also conducted with several key informants to validate interpretations. These procedures collectively enhance the overall trustworthiness of qualitative findings and complement the statistical robustness of the quantitative analysis.

Qualitative Procedures

The qualitative segment followed a systematic protocol to ensure depth, accuracy, and credibility. Semi-structured interview guides were developed based on the study's conceptual framework, allowing flexibility for participants to elaborate on issues such as digital transformation, cross-unit coordination, and career development. This approach ensured that essential topics were covered while allowing for emergent insights.

Interviews were transcribed verbatim and analyzed using a multi-stage coding process. Open coding identified initial patterns, axial coding grouped related themes, and selective coding synthesized key insights that aligned with or expanded upon the quantitative results. This layered coding strategy strengthened interpretive precision and prevented premature conclusions.

Observation notes and document analysis served as additional data sources that enriched understanding of institutional practices. Administrative workflows, standard operating procedures, and digital system usage were examined to contextualize interview findings. The integration of multiple qualitative sources ensures a comprehensive institutional portrait and deepens the study's contribution to higher education administration research.

RESULTS

Measurement Model Evaluation

The evaluation of the measurement model began with assessing indicator reliability through outer loadings. All indicators across the constructs digital competence, organizational capability, career path clarity, cross-unit collaboration, administrative process effectiveness, and administrative service quality displayed loadings above 0.70, which meets the recommended threshold for adequate reliability. Many indicators exceeded 0.80, demonstrating strong relationships between the observed items and their underlying latent constructs. These results indicate that the questionnaire items successfully captured the conceptual dimensions intended by the study.

Convergent validity was further confirmed through the Average Variance Extracted (AVE) values. All constructs showed AVE values ranging from 0.70 to 0.82, surpassing the minimum acceptable value of 0.50. This indicates that more than half of the variance in each construct is explained by its corresponding indicators, confirming the adequacy of the measurement scales. The findings suggest that the constructs exhibit both internal coherence and conceptual clarity, which is essential for reliable model estimation.

Internal consistency reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR). All constructs reported Cronbach's Alpha values above 0.90 and CR values above 0.92, demonstrating excellent reliability. These results reflect the stability and consistency of the measurement instrument and confirm that respondents interpreted the items consistently across the sample. High reliability enhances confidence in subsequent structural model analysis.

Discriminant validity was assessed through two methods: the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. The Fornell–Larcker results showed that the square root of AVE for each construct was higher than the inter-construct correlations, indicating clear distinction between constructs. HTMT values were all below 0.85, supporting the conclusion that each construct measures a unique domain of administrative capability or performance. Collectively, these results provide strong evidence that the measurement model is valid, reliable, and suitable for structural analysis.

Table 2. Measurement Model Results

Construct	Indicator	Loading	Cronbach's Alpha	CR	AVE
Digital Competence	DC1	0.81	0.92	0.94	0.72
	DC2	0.85			
	DC3	0.88			
	DC4	0.84			
Organizational Capability	OC1	0.83	0.93	0.95	0.74
	OC2	0.87			

	OC3	0.89			
	OC4	0.85			
Career Path Clarity	CPC1	0.79	0.91	0.93	0.69
	CPC2	0.84			
	CPC3	0.86			
	CPC4	0.81			
Cross-Unit Collaboration	CUC1	0.82	0.90	0.93	0.68
	CUC2	0.85			
	CUC3	0.83			
	CUC4	0.80			
Administrative Process Effectiveness	APE1	0.87	0.94	0.96	0.78
	APE2	0.89			
	APE3	0.90			
	APE4	0.88			
Administrative Service Quality	SQ1	0.86	0.95	0.96	0.79
	SQ2	0.91			
	SQ3	0.88			
	SQ4	0.90			

Structural Model Evaluation

After confirming measurement validity, the structural model was evaluated to examine causal relationships among the variables. The model demonstrated strong predictive power, with the R^2 value for administrative service quality reaching 0.560, indicating that the combination of digital competence, organizational capability, career path clarity, cross-unit collaboration, and administrative process effectiveness explains 56% of the variance in service quality. This level of explanatory power is considered substantial in behavioral and organizational research, particularly in complex models involving multiple constructs and contextual variables.

Path coefficient analysis revealed that all exogenous variables had significant direct effects on administrative service quality. Organizational capability exhibited one of the strongest effects ($\beta = 0.147$, $p < 0.001$), highlighting the central role of institutional structures, leadership support, and system integration in shaping service performance. Administrative process effectiveness also showed a strong positive influence ($\beta = 0.304$, $p < 0.001$), reinforcing the argument that efficient processes amplify the impact of other HR-related inputs. Digital competence and cross-unit collaboration demonstrated significant but comparatively smaller coefficients, suggesting that while important, their influence is mediated by broader organizational mechanisms.

Career path clarity also contributed significantly to service quality ($\beta = 0.096$, $p < 0.01$). Although its effect size was modest, the statistical significance indicates that employees who understand their career progression and competency expectations are more likely to perform administrative functions effectively. This aligns with human resource development theories that emphasize the motivational role of transparent career systems.

The assessment of effect sizes (f^2) shows that administrative process effectiveness and organizational capability exert moderate impacts on the dependent variable, while other variables exhibit small yet meaningful effect sizes. These findings provide a nuanced understanding of how various factors interact to influence administrative service outcomes and underscore the importance of addressing both structural and individual-level determinants.

Table 3. Structural Model Path Coefficients

Hypothesis	Path	β	t-value	p-value	Supported?
H1	DC \rightarrow SQ	0.115	2.23	0.026	Yes
H2	OC \rightarrow SQ	0.147	3.87	<0.001	Yes
H3	CPC \rightarrow SQ	0.096	2.72	0.007	Yes
H4	CUC \rightarrow SQ	0.122	2.11	0.035	Yes
H5	APE \rightarrow SQ	0.304	6.14	<0.001	Yes

(All t-values > 1.96 indicate significance at $\alpha = 5\%$)

Moderating Effect of Administrative Process Effectiveness

A key objective of the study was to examine whether administrative process effectiveness moderates the relationship between the four independent variables and administrative service quality. The interaction terms ($M \times X1$, $M \times X2$, $M \times X3$, and $M \times X4$) demonstrated significant moderating effects across all paths, indicating that

process effectiveness strengthens the influence of digital competence, organizational capability, career clarity, and cross-unit collaboration on service quality. This suggests that without effective processes, improvements in staff skills or structural conditions may not translate into enhanced service outcomes.

The moderating effect was strongest in the relationship between digital competence and service quality. This implies that digital skills alone are insufficient unless complemented by streamlined, standardized, and well-integrated administrative processes. Staff who possess strong digital abilities can apply these skills more effectively when workflows are clear and supported by digital tools. Conversely, in inefficient systems, even highly competent staff may experience delays and inconsistencies that limit their performance.

The moderation between organizational capability and service quality further highlights the centrality of process effectiveness. Institutions with strong structures, leadership, and coordination mechanisms benefit more from efficient processes because these create alignment between institutional strategy and operational execution. This finding aligns with organizational theory emphasizing that the interaction between capability and process determines overall institutional performance.

Moderation in the relationship between career path clarity and collaboration with service quality illustrates how process effectiveness facilitates both human resource development and cross-unit work. Clear administrative workflows help staff understand their responsibilities, navigate promotions, and engage in coordinated tasks across units. Thus, process effectiveness serves as an operational lever that enhances the impact of all other independent variables, reaffirming its strategic role within the institutional quality framework.

Table 4. Moderating Effect of Administrative Process Effectiveness

Interaction Term	β	t-value	p-value	Interpretation
DC \times APE \rightarrow SQ	0.081	2.06	0.040	Significant
OC \times APE \rightarrow SQ	0.093	2.88	0.004	Significant
CPC \times APE \rightarrow SQ	0.067	2.02	0.044	Significant
CUC \times APE \rightarrow SQ	0.072	2.13	0.033	Significant

Qualitative Findings

The qualitative component provided valuable insights that enriched and contextualized the quantitative results. Interviews with key informants revealed that many administrative units still rely on partially manual workflows, which slows down task completion and contributes to inconsistencies across units. Informants frequently cited the need for fully integrated digital systems that connect faculties and central bureaus, enabling more seamless coordination and reducing delays. These observations support the quantitative findings regarding the importance of administrative process effectiveness.

Digital competence emerged as a recurring theme in the qualitative interviews. While younger staff tended to adapt more quickly to digital platforms, senior personnel often required additional support and training. Informants highlighted a need for routine digital literacy programs, role-based IT training, and peer-learning systems to ensure that all staff remain up-to-date with institutional technologies. These insights confirm that skill disparities remain a challenge and are strongly linked to variations in service quality.

Organizational capability was also emphasized, particularly in relation to leadership style and coordination mechanisms. Respondents noted that communication across units is sometimes fragmented, with information flowing vertically but less effectively across departments. This leads to redundant processes, unclear responsibilities, and delays in service delivery. Informants suggested that leadership must prioritize collaborative governance, encourage cross-unit communication, and establish integrated monitoring systems to improve coordination.

Career path clarity surfaced as an area requiring significant improvement. Many educational personnel expressed uncertainty about promotion criteria, competency requirements, and available development opportunities. This lack of clarity affects motivation and reduces engagement, making it difficult to retain skilled administrative staff. Informants recommended that the university adopt a competency-based career framework accompanied by transparent guidelines and regular performance evaluations. These qualitative insights reinforce the need for organizational reforms to complement digital transformation efforts.

Integrated Interpretation of Quantitative and Qualitative Results

The integration of quantitative and qualitative findings provides a more complete understanding of the factors influencing administrative service quality. Quantitative results show that all independent variables exert significant effects, with administrative process effectiveness acting as a central driver and moderator. Qualitative findings, meanwhile, illustrate how these relationships manifest in daily administrative practices, revealing the procedural, cultural, and technical barriers that influence service delivery.

Taken together, the results highlight that improvements in digital competence, organizational capability, or collaboration must be supported by redesigned workflows and digital integration to achieve meaningful performance gains. For example, while staff may receive training in digital tools, the absence of integrated systems or clear SOPs can limit the actual impact of such training. Thus, quantitative and qualitative insights converge on the conclusion that structural reforms and process optimization are essential for unlocking the full potential of human resource initiatives.

The results also indicate that career path clarity plays a motivational role, but its effectiveness depends on institutional consistency and leadership commitment. Qualitative data show that administrative staff are eager for clearer promotion pathways, suggesting that human resource policies must be updated to reflect new digital and organizational demands. When combined with process improvements, this can significantly enhance staff engagement and service performance.

Finally, the interplay between collaboration and process effectiveness emerges as a critical area for intervention. Quantitative data demonstrate a significant moderating effect, while qualitative findings reveal operational bottlenecks caused by siloed communication. To achieve integrated administrative service quality, the institution must simultaneously enhance digital coordination platforms, strengthen leadership support, and foster a culture of shared responsibility across units.

DISCUSSION

The results of this study reinforce the argument that improving administrative service quality in higher education requires a synergistic relationship between individual competence, organizational structures, and operational processes. The significant influence of digital competence indicates that staff ability to navigate digital tools has become a fundamental requirement in modern university administration. However, qualitative evidence shows persistent disparities in digital readiness, particularly between younger and older personnel, suggesting that digital transformation strategies must be accompanied by targeted training programs and continuous professional development. This aligns with recent literature emphasizing that technology adoption is only as effective as the human resources that support it.

Organizational capability emerged as one of the strongest predictors of administrative service quality, underscoring the importance of structural coherence, leadership effectiveness, and institutional agility. Strong organizational capability provides the conditions under which digital tools and human competence can be fully leveraged. When organizational systems function cohesively, administrative units benefit from clearer communication channels, better coordination, and reduced duplication of work. These findings are consistent with studies showing that organizational readiness significantly determines the success of digital initiatives and administrative reforms in higher education.

Career path clarity, though exhibiting a smaller effect size, plays a crucial motivational role in shaping employee performance. The study highlights that many administrative personnel remain uncertain about promotion pathways, competency expectations, and development opportunities. This uncertainty can hinder employee engagement and long-term retention. Therefore, the significance of career path clarity reflects the need for institutions to implement transparent, competency-based career frameworks that support staff in adapting to new technological and administrative demands. Such frameworks can enhance employee confidence, foster professional identity, and encourage proactive performance.

Cross-unit collaboration also demonstrates a positive association with administrative service quality, emphasizing the need for integrated workflows and shared responsibility across departments. Qualitative findings reveal lingering fragmentation and communication silos, which often result in inefficiencies and inconsistent service outcomes. Strengthening collaborative mechanisms such as joint task forces, integrated information systems, and cross-functional committees can enhance institutional coherence and reduce operational bottlenecks. This supports existing research showing that collaboration is a key enabler of institutional agility in complex educational environments.

Administrative process effectiveness plays a pivotal moderating role, amplifying the influence of every independent variable on service quality. This finding suggests that digital skills, organizational alignment, career development, and collaboration cannot reach their full potential unless administrative processes are well-designed, streamlined, and supported by digital technologies. Institutions with inefficient or partially manual workflows struggle to translate organizational reforms into tangible service improvements. Thus, administrative process effectiveness operates as a strategic lever that turns institutional capability and human competence into measurable performance gains.

The integration of quantitative and qualitative insights illustrates that administrative transformation in universities must adopt a holistic approach rather than isolated interventions. For instance, providing digital training without restructuring workflows or improving organizational coordination may produce limited results.

Similarly, enhancing career pathways without addressing process inefficiencies may not sufficiently motivate staff to improve their performance. The study therefore highlights the interconnected nature of institutional systems, where structural, procedural, and human components must evolve together to achieve sustainable improvements in service quality.

Overall, the findings contribute to the growing discourse on digital governance and administrative modernization in higher education. They suggest that universities particularly in developing contexts must prioritize integrated digital ecosystems, strengthen organizational governance, clarify career development strategies, and redesign administrative workflows. By doing so, institutions can enhance responsiveness, foster staff engagement, and ensure that administrative services support broader academic and strategic objectives.

CONCLUSION

Theoretical Conclusion

The findings of this study provide a comprehensive theoretical contribution by demonstrating that administrative service quality in higher education is shaped by a constellation of interrelated factors involving digital competence, organizational capability, career path clarity, and cross-unit collaboration. The structural model confirms that these constructs exert significant direct effects on service quality, underscoring the importance of integrating individual and organizational perspectives in administrative performance research. This multidimensional approach supports emerging theories that view administrative effectiveness as the product of both human capital and institutional architecture.

Another key theoretical insight is the central role of administrative process effectiveness, which not only impacts service quality directly but also moderates the influence of all other variables. This confirms and extends previous studies suggesting that processes serve as the operational backbone through which organizational reforms and human resource development translate into performance outcomes. By establishing process effectiveness as a powerful moderating construct, this study advances a more holistic theoretical model for understanding administrative performance in higher education.

The study also contributes to the literature by empirically validating career path clarity as a significant, though modest, predictor of administrative service quality. This reinforces theoretical arguments that non-academic staff motivation and identity formation are crucial determinants of institutional performance. The importance of clear career trajectories is often underemphasized in public-sector higher education research, and this study helps fill that gap by reflecting how transparent career structures influence employee engagement and service delivery.

Furthermore, the integration of qualitative findings strengthens the theoretical model by contextualizing the statistical relationships observed. The insights from interviews and organizational documents reveal the lived realities behind quantitative patterns, illustrating how organizational culture, leadership practices, and digital disparities shape administrative outcomes. The convergence of quantitative precision and qualitative depth enhances the study's theoretical robustness and contributes to a more nuanced understanding of administrative system dynamics in higher education.

PRACTICAL AND POLICY IMPLICATIONS

The results of this study carry significant practical implications for universities seeking to enhance administrative service quality. First, the strong influence of digital competence suggests that institutions must invest in structured, continuous digital training tailored to the diverse needs of staff. Training programs should go beyond basic digital literacy to include systems integration, data management, cybersecurity awareness, and the use of analytics tools. In addition, mentorship programs leveraging digitally proficient staff can support those with lower digital readiness, especially senior employees.

Organizational capability emerged as a critical determinant of service quality, indicating that leadership must prioritize building integrated governance systems. This includes strengthening communication channels across units, fostering collaborative cultures, and ensuring that digital and structural initiatives are aligned with institutional strategy. Universities should consider implementing centralized monitoring dashboards, standardized reporting mechanisms, and participatory leadership approaches to reduce fragmentation and improve coordination.

The implications for human resource policy are equally significant. Clear and competency-based career pathways must be developed to enhance motivation, performance, and retention among administrative staff. Institutions should redesign job descriptions, align appraisal systems with digital transformation objectives, and establish transparent promotion criteria. Career development should also include training roadmaps, certification pathways, and opportunities for cross-unit rotation to build multidisciplinary administrative expertise.

Finally, the moderating role of administrative process effectiveness demonstrates that workflow redesign and digital process integration are indispensable for translating organizational reforms into tangible performance improvements. Universities should conduct regular process audits, streamline SOPs, reduce manual procedures, and increase automation in administrative workflows. Policies must ensure that digital systems are interoperable across units and supported by adequate infrastructure. By combining process optimization with human and organizational capacity building, institutions can create an enabling environment that consistently delivers high-quality administrative services.

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