

## Sustainable Digital Transformation in Indonesian Higher Education: The Role of Service Planning and Architecture Strategy within an Agile IT Governance Approach

**Johan Reimon Batmetan**

Department of Information and Communication Technology Education,  
Universitas Negeri Manado, Indonesia  
[john.reimon@unima.ac.id](mailto:john.reimon@unima.ac.id)

**Abstract:** Digital transformation has become a strategic priority for higher education institutions in Indonesia in responding to technological disruption, stakeholder expectations, and institutional competitiveness. However, many universities continue to face challenges in aligning digital initiatives with organizational strategy and adaptive IT governance. This study examines how Service Planning and Architecture Strategy contribute to institutional digital transformation through an Agile IT Governance framework in the Indonesian higher education context. This study uses a single-case study at Manado State University. A qualitative approach using SWOT analysis, IFAS–EFAS evaluation, and portfolio mapping through the McFarlan Strategic Grid. Data were collected through interviews with 12 institutional stakeholders, including university leaders, IT managers, quality assurance representatives, and digital service users, supported by analysis of institutional strategic documents such as IT master plans, governance policies, and digital transformation reports collected between January and June 2025. An IFAS score of 1.4 and an EFAS score of 0.2 position the university in Quadrant I, indicating strong internal capability to pursue an aggressive transformation strategy despite moderate external pressures. Internal strengths include the existence of standardized IT Service Management practices and consistent quality management implementation. However, structural limitations are identified in the absence of formal enterprise architecture standards and the lack of an integrated IT service catalog system. Portfolio mapping shows that 7 out of 9 digital initiatives are concentrated within the Strategic and Key Operational quadrants, confirming IT’s transition from a support function to a value-driving institutional asset. The study concludes that digital transformation in Indonesian universities is significantly enabled by mature service planning but requires strengthened architectural standardization and governance integration to ensure long-term sustainability. Findings indicate strong internal capabilities in IT service management and digital service quality, supporting proactive transformation initiatives. Nonetheless, gaps in enterprise architecture standards and service catalog management pose structural risks to long-term continuity. Portfolio mapping reveals a concentration of initiatives within Strategic and Key Operational domains, signaling the evolving role of IT from operational support to institutional value driver. The study concludes that effective digital transformation in Indonesian universities depends on the alignment of service planning, architecture strategy, and agile governance mechanisms to sustain organizational resilience and strategic adaptability.

**Keywords:** Sustainable Digital Transformation; Indonesian Higher Education; Service Planning; Enterprise Architecture Strategy; Agile IT Governance; McFarlan Strategic Grid.

## INTRODUCTION

Digital transformation in higher education is no longer merely an option but has become a strategic necessity to improve the quality of academic services, operational efficiency, and institutional competitiveness in the global era. Digital transformation is the integration of digital technology into all aspects of an institution's functions, requiring fundamental changes to processes, service models, and organizational culture to sustainably respond to the needs of students, faculty, and stakeholders (Fernández et al., 2023). This transformation requires thorough service planning and a comprehensive digital architecture strategy to ensure that various technology initiatives are not fragmented but aligned with the institution's strategic objectives. In this context, digital enterprise architecture serves as a blueprint that maps the interrelationships between business processes, data, applications, and infrastructure so that every technology investment supports the achievement of strategic and operational goals (Sanchez-Puchol et al., 2017).

However, the main challenges in implementing sustainable digital transformation are the complex dynamics of environmental change, stakeholder expectations, and technological uncertainty. Traditional IT governance approaches often fail to respond quickly to change due to their rigidity and bureaucracy. Agile IT governance approaches emerged in response to these needs, emphasizing iteration, cross-functional collaboration, and continuous feedback loops to ensure technology decisions can be adapted to changing needs and opportunities (Olsen & Trelsgård, 2016) (Purwanto et al., 2024). The integration of agile approaches into IT governance enables responsive service planning and architecture strategies to support the ongoing digital transformation process in higher education.

Research into digital transformation in higher education has grown rapidly over the past decade, particularly following the acceleration caused by the pandemic and the need to adapt to the demands of the digital era. Multi-vocal studies have shown that many higher education institutions (HEIs) have initiated various digital transformation initiatives, but most have not yet been integrated into a comprehensive strategy and strategically organized plan, thus highlighting the need for a more holistic framework for service planning and technology architecture as a foundation for sustainable implementation (Fernández et al., 2023). HEIs' digital transformation focuses on the adoption of technologies such as learning management systems, advanced analytics, and artificial intelligence, and their operational implications for educational services and learning processes. These findings highlight that technology adoption alone is insufficient without comprehensive strategic planning to ensure long-term

benefits and alignment with organizational goals (Carmo et al., 2025). Traditional governance approaches are often rigid and less adaptable to rapid changes in the digital environment, so the agile governance approach is proposed as a model that is more responsive to the complexity and dynamics of information technology needs in HEIs.

In the context of technology architecture, enterprise architecture is seen as a strategic blueprint for ensuring integration across applications, business processes, data, and IT infrastructure, thus supporting effective and sustainable service delivery. A robust architecture helps higher education institutions systematically plan and manage technology investments and ensure interoperability across institutional information systems. Research on such architectures shows that a mature architectural approach positively impacts operational efficiency and an organization's adaptive capabilities to new technological developments. However, there is a lack of empirical studies that combine service planning, IT architecture strategy, and agile IT governance within a unified theoretical framework (Olsen & Trelsgård, 2016). This creates a significant research gap on how higher education institutions can adopt an agile IT governance model that supports systematic service planning and architecture strategy to achieve sustainable digital transformation (Singun, 2025). Going forward, research that integrates these three elements is considered crucial to understanding the driving factors for the success of digital transformation that are not only technical but also strategic and structural, including the role of stakeholders, organizational culture, and flexibility in technology decision-making.

Sustainable digital transformation in higher education cannot be achieved solely through technology adoption, but requires strategic orchestration between service planning, IT architecture strategy, and agile IT governance mechanisms (Wang et al., 2023). Service planning serves as a connecting mechanism between stakeholder needs and the institution's digital capabilities, thereby determining service priorities, digital service quality, and alignment with the university's strategic objectives (Carmo et al., 2025). Service planning is positioned as an initial determinant influencing the effectiveness of sustainable digital transformation implementation. Meanwhile, information technology architecture strategy serves as a structural foundation that ensures the integration, interoperability, and scalability of institutional information systems. A strategically designed architecture enables universities to avoid system fragmentation and ensures that digital service development is consistent with the long-term roadmap. Empirical studies in higher education confirm that enterprise architecture maturity significantly contributes to operational efficiency and an institution's adaptive capacity in responding to technological change

(Pham et al., 2021). Therefore, architectural strategy is positioned as a structural mediating variable that strengthens the influence of service planning on the success of sustainable digital transformation.

Digital transformation in Indonesian higher education is shaped not only by technological readiness but also by policy direction, governance maturity, institutional resource constraints, and socio cultural dynamics. National initiatives such as the digital transformation roadmap within the Merdeka Belajar framework emphasize institutional autonomy and technology enabled learning ecosystems (Kemendikbudristek, 2021). However, implementation across public universities remains uneven due to differences in financial capacity, governance maturity, and infrastructural readiness (World Bank, 2020). At the regional level, Southeast Asian higher education institutions face similar governance challenges, particularly in aligning IT strategy with institutional missions in resource constrained environments (ADB, 2022). Studies on enterprise architecture adoption in emerging economies further indicate that institutional fragmentation and legacy systems often hinder integrated digital transformation (Banaeianjahromi & Smolander, 2019). In Indonesia specifically, cultural dimensions such as hierarchical decision making structures and risk aversion influence technology adoption patterns within public institutions (Raharjo et al., 2022). These dynamics are compounded by limited funding flexibility and bureaucratic governance structures that constrain strategic IT investment (Suryadi & Tilaar, 2021). Together, these structural and cultural factors highlight the importance of context sensitive digital transformation strategies that integrate governance agility with service planning and architectural alignment.

However, the relationship between service planning and architecture strategy will not be optimal without an adaptive governance framework. This is where agile IT governance plays a key role as a dynamic control mechanism that enables rapid, collaborative, and value-based IT decision-making. The agile governance approach emphasizes continuous iteration, stakeholder engagement, and continuous feedback, which has proven relevant in the complex and demanding context of higher education, which is full of academic and administrative interests (Tangi et al., 2021). Agile Enterprise Architecture in higher education which highlights architectural flexibility in digital transformation), but the study has not theoretically combined agile governance with strategic service planning in the context of higher education sustainability (Sararuch et al., 2023). In this conceptual framework, agile IT governance is positioned as a moderating variable that strengthens the effectiveness of service planning and architecture strategy in driving sustainable digital transformation.

Thus, the conceptual framework of this study proposes that sustainable digital transformation in higher education is directly influenced by service

planning, structurally strengthened by IT architecture strategy, and dynamically accelerated through agile IT governance. This model offers an integrative approach that has not been widely tested empirically, while also providing theoretical and practical contributions to the development of sustainability-oriented IT governance in higher education (Zhukabayeva et al., 2025)(Nermend et al., 2022). This research direction positions service planning and digital architecture as key elements in strengthening an agile IT governance framework, to ensure that digital transformation is not only successful in the initial phase but also sustainable and adaptive to future changes. This concept aligns with findings showing that higher education institutions need to design and implement a comprehensive digital strategy, which includes a governance model, technology architecture, and service planning as key pillars in sustainable digital transformation efforts (Singun, 2025)(Fernández et al., 2023).

While previous research has focused on digital transformation in higher education from the perspective of technology adoption, common success factors, or its impact on operational efficiency, few have systematically explored the strategic role of service planning and enterprise architecture in supporting sustainable digital transformation. While previous models demonstrate that IT architecture provides a framework for technology and service integration, the focus remains fragmented on technical or operational aspects without a deep strategic alignment within the context of stakeholder-oriented institutional services (Fernández et al., 2023)(Diogo et al., 2023).

A structured review of Scopus indexed journal publications between 2018 and 2025 was conducted using the combined keywords digital transformation AND higher education AND service planning OR IT architecture OR agile governance. The search yielded 86 relevant articles. Of these, only 18% examined digital transformation through an architectural perspective linked to institutional service delivery, while 12% addressed governance agility within higher education environments. Importantly, none of the identified studies integrated service planning, IT architecture, and agile governance within a single empirical framework. Existing studies tend to address these domains in isolation. Research by Fernández et al. (2023) and Carmo et al. (2025) examined digital transformation primarily from service and operational perspectives without architectural integration. Meanwhile, studies such as Sararuch et al. (2023) focused on enterprise architecture as a technical or structural enabler but did not connect it to institutional service planning. Similarly, governance oriented works including Tangi et al. (2021) emphasized adaptive governance mechanisms but lacked explicit linkage to service strategy and architectural maturity.

This fragmentation highlights a critical conceptual gap. Digital transformation in higher education is often treated as either a technological adoption issue, a governance challenge, or a service innovation process, rather than as an integrated strategic system. The absence of empirical studies combining these three constructs becomes particularly significant in emerging economy contexts such as Indonesia, where transformation efforts are shaped by resource limitations, evolving governance maturity, and uneven institutional digital readiness. These contextual realities differ substantially from the resource rich environments that dominate Western centric digital transformation literature. Therefore, this study addresses an important gap by empirically examining how service planning, architecture strategy, and agile IT governance interact within a unified strategic framework to support digital transformation in Indonesian higher education.

This study advances digital transformation theory in higher education by proposing and empirically examining an integrated strategic relationship between service planning, IT architecture, and agile governance. Unlike prior research that treats these constructs independently, this study conceptualizes digital transformation as an orchestrated interaction between service orientation, structural architecture, and adaptive governance mechanisms. The novelty of this research is the integration of two strategic domains that have been studied separately: digital service planning, which explicitly targets the quality, user experience, and sustainability of digital services, and enterprise architecture, a structural strategy that maps the relationship between IT resources, organizational processes, and long-term strategic goals. Empirical research explicitly integrating these two strategies in the context of higher education is still very limited, particularly that connecting them to the sustainability aspect of adaptive IT governance. Our proposed agile IT governance framework is part of the solution to bridge the dynamics of rapid technological change with the need for consistent and adaptive strategic planning, enabling service planning and enterprise architecture to serve not only as operational support elements but also as synergistic drivers of the institution's digital goals.

The purpose of this research is to analyze sustainable digital transformation strategies in higher education, with Service Planning and Architecture effectively synergized through Agile IT Governance mechanisms. Thus, adaptive, collaborative, and feedback-based Agile IT Governance can be implemented with an appropriate and sustainable strategy. Thus, this research not only targets a descriptive understanding of digital transformation practices, but also aims to produce strategic guidelines that can be used by higher education leaders and IT managers as a basis for decision-making in designing, implementing, and evaluating digital transformation that is sustainable,

organizational resilience, and creates long-term value for all higher education stakeholders. With this approach, the research presents new contributions in the form of: 1) an emphasis on digital service planning that is directly connected to IT architecture; 2) the integration of enterprise architecture as a strategic foundation, not just a technical one, in the digital transformation model; and 3) strengthening agile IT governance as a mediator that allows these two strategies to converge adaptively in facing the complexity of the rapidly changing digital environment, while maintaining the continuity of service value for higher education stakeholders. This approach has not been widely explored, thus providing significant theoretical and practical contributions to the development of sustainable and responsive digital transformation strategies in the higher education sector. Empirically, this research provides evidence from an emerging higher education context in Indonesia, demonstrating how internal capability shape transformation readiness. The study further reveals that 7 out of 9 institutional digital initiatives are concentrated within strategic and key operational domains, confirming the structural transition of IT from support function to institutional value driver. Methodologically, this study introduces a combined strategic analysis framework integrating SWOT analysis, IFAS–EFAS evaluation, and McFarlan Strategic Grid mapping within an Agile IT Governance perspective. This approach moves beyond perception based assessment by linking institutional capability analysis with portfolio level strategic positioning.

## **RESEARCH METHODOLOGY**

### **Research Design**

This research uses a qualitative-descriptive research design with an applied case study approach at a higher education institution that is currently implementing or has implemented a digital transformation initiative. This approach was chosen to gain a deep and contextual understanding of how Service Planning and Architecture Strategy are designed, implemented, and managed within an Agile IT Governance framework. This research design allows researchers to examine the digital transformation phenomenon holistically, taking into account organizational dynamics, IT governance, and interactions between key stakeholders within the higher education environment.

The SWOT analysis method is used as the main analysis tool to identify internal and external conditions that influence the Service Planning and Architecture strategy in digital transformation (FME, 2013)(Mashuri & Nurjannah, 2020). Internal factors are analyzed by identifying strengths and weaknesses that reflect institutional readiness, IT service maturity, and technology architecture capabilities. Meanwhile, external factors are analyzed

through opportunities and threats related to education policy, technological developments, global competition, and the dynamics of the social and economic environment (Prasetyo, 2018) (Tuha & Oktabian, 2020). The results of the SWOT analysis are then mapped into a strategy matrix to determine the institution's strategic position and formulate priorities for sustainable digital transformation strategies (David & David, 2017) (Sararuch et al., 2023).

### **Research Instruments**

The research instrument was developed based on a review of the latest literature on digital transformation, IT governance, service management, and enterprise architecture in higher education. The interview guide was semi-structured to allow for in-depth yet focused exploration of strategic issues. The questionnaire was designed using a five-point Likert scale to measure respondents' perceptions of the dimensions of Service Planning, Architecture Strategy, and Agile IT Governance (Wautelet, 2019). The instrument's content validity was tested through expert judgment, while the questionnaire's reliability was assessed using an appropriate reliability coefficient. With this methodology, the research is expected to produce credible, systematic, and relevant findings to support the development of sustainable digital transformation strategies in higher education (Amorim et al., 2021) (Tsilionis & Wautelet, 2022).

### **Data Collection**

Data collection was conducted through in-depth interviews, documentation studies, and structured questionnaires. Interviews were conducted with university leaders, IT managers, quality assurance units, and representatives of digital service users to explore perceptions, experiences, and actual practices related to service planning and architecture strategy. The documentation study included an analysis of institutional strategic documents, such as IT master plans, IT governance policies, service standards, and digital transformation implementation reports. Meanwhile, questionnaires were used to obtain supporting quantitative data regarding the level of digital service maturity, IT architecture readiness, and the effectiveness of Agile IT Governance mechanisms. Data were collected through a case study at Manado State University. The informant data used in this study can be seen in Table 1.

**Table 1. Research Informant Data**

No	Informant Code	Position at University	Functional Role	Years of Experience	Level of Involvement in Digital Transformation	Decision Authority Level
1	INF-01	Rector	Strategic leadership and institutional planning	18 years	High	Strategic
2	INF-02	Vice Rector for Academic Affairs	Academic service integration	20 years	High	Strategic
3	INF-03	Head of ICT Center	IT governance and infrastructure oversight	15 years	High	Strategic
4	INF-04	Secretary of ICT Center	IT service coordination	12 years	High	Operational
5	INF-05	Head of Institutional Planning Unit	Strategic planning and policy alignment	14 years	High	Strategic
6	INF-06	Head of Academic Administration Bureau	Academic information systems management	16 years	Medium	Managerial
7	INF-07	Head of Finance Bureau	Digital financial services implementation	17 years	Medium	Managerial
8	INF-08	Senior Systems Analyst	Enterprise systems development	11 years	High	Technical
9	INF-09	Network Infrastructure Manager	Network and platform reliability	13 years	High	Technical
10	INF-10	Digital Services Development Staff	Application development	9 years	Medium	Technical
11	INF-11	Quality Assurance Unit Representative	Service evaluation and performance monitoring	10 years	Medium	Managerial
12	INF-12	E-Government Implementation Staff	Digital governance operations	8 years	Medium	Operational

Table 1 presents the profiles of the twelve informants involved in the semi-structured interviews, including their structural position, professional experience, level of involvement in digital transformation, and level of decision-making authority. Informants were selected purposively to ensure representation of strategic, managerial, and technical perspectives in university digital transformation governance. Some informants held strategic authority levels, such as university leaders and heads of planning units, who play a role in setting policy direction and priorities for institutional digitalization. Managerial informants provided insights into policy implementation and cross-unit coordination, while technical and operational informants contributed to understanding infrastructure readiness, system development, and implementation challenges in the field.

The relatively extensive distribution of professional experience and active involvement in digital initiatives ensured that the data obtained was not only descriptive but also reflective of the decision-making process and dynamics of technology governance. Thus, the composition of the informants supported in-depth analysis of the relationship between service planning, IT architecture, and digital governance in the context of institutional transformation.

Informants in this study were selected using purposive sampling to ensure the involvement of actors with substantive knowledge and a direct role in the service planning process and management of information technology architecture at the university level. This approach was used because the research focused on an in-depth understanding of the dynamics of digital transformation governance, requiring the participation of individuals involved in strategic decision-making, policy implementation, and the operationalization of digital systems. This purposive approach enabled the study to obtain strategically and operationally relevant perspectives and supported triangulation of views between the policy and technical implementation levels. Furthermore, the distribution of informants based on level of decision-making authority provided a more comprehensive understanding of how digital priorities are set, translated into system architecture, and implemented in institutional practice.

The selection of informants took into account three main criteria: structural position within the organization, level of involvement in digital transformation initiatives, and authority in decision-making processes related to services and technology. Therefore, informants included university leaders, ICT unit managers, institutional planners, and technical staff involved in the development and implementation of digital services.

The interview data collection process was conducted until data saturation was reached, when additional interviews no longer yielded significant

new themes or insights related to service planning, IT architecture, and digital transformation governance. After the tenth interview, key thematic patterns began to recur, particularly regarding system integration challenges, resource constraints, and the need for cross-unit coordination. Two additional interviews were conducted to confirm the findings and test the consistency of perspectives across organizational levels. The results indicate that the insights gained from informants at the strategic, managerial, and technical levels reflected a sufficient variety of experiences and perspectives to support the research analysis. Therefore, twelve informants were deemed sufficient to achieve in-depth contextual understanding and support interpretive validity in this case study.

To enhance the credibility of the findings, this study applied triangulation of data sources by combining in-depth interviews, institutional document analysis, and mapping of ongoing digital initiatives at the university level. The documents analyzed included the institution's strategic plan, information technology development policy, digital roadmap, and reports on the implementation of information systems-based services. Triangulation was also conducted from a perspective perspective by involving informants from strategic, managerial, and technical levels. This approach allowed for cross-confirmation between formal policies, implementation practices, and operational conditions on the ground. Furthermore, interview results were compared with the findings of the SWOT analysis and portfolio mapping to ensure consistency between informants' narratives and the institution's structural conditions. Through this combination of source and perspective triangulation, the study sought to minimize individual perception bias and strengthen interpretive validity in understanding the relationship between service planning, IT architecture, and digital transformation governance.

### **Interview Transcription, Translation, and Coding Procedures**

All semi-structured interviews were audio-recorded with participants' consent and subsequently transcribed verbatim. The interviews were conducted primarily in Bahasa Indonesia, with several technical terms occasionally expressed in English depending on the respondents' professional familiarity with IT governance terminology. To ensure consistency for this English-language manuscript, all transcripts were translated into English using a rigorous translation protocol. Initial translation was performed by the research team, followed by a back-translation process conducted by an independent bilingual academic reviewer to ensure semantic equivalence and minimize meaning distortion.

The transcribed data were analyzed using a structured thematic coding approach. Coding was conducted through a hybrid scheme combining deductive

and inductive strategies. Deductive coding was based on the study's analytical framework, including dimensions of service planning, IT architecture maturity, governance agility, and strategic alignment. Inductive coding was applied to capture emergent themes related to institutional constraints, organizational culture, and resource limitations. Data coding was performed using manual procedure to ensure systematic data organization and traceability. Two independent coders were involved in the analysis process. Both coders underwent an initial calibration phase to align interpretations of coding categories. Inter-coder reliability was assessed using Cohen's Kappa coefficient, which yielded a score of 0.82, indicating strong agreement.

Themes were identified through an iterative process involving open coding, axial categorization, and cross-case comparison across respondent groups. Pattern matching was used to relate empirical insights to the strategic constructs of SWOT, IFAS-EFAS, and portfolio positioning. Divergent or contradictory statements were not excluded; instead, they were examined through constant comparison to identify underlying contextual explanations such as differences in managerial roles, technical expertise, or institutional responsibilities. These contradictions were used to refine thematic interpretations and enhance analytical robustness rather than being treated as anomalies.

### **Data Analysis Techniques**

In this study, data analysis techniques were carried out in stages and systematically to ensure that the formulated Service Planning and Architecture strategy was truly based on the empirical conditions of the institution and was in line with the principles of Agile IT Governance (Widjajarto et al., 2019)(Tamm et al., 2022). The analysis begins with the application of a SWOT analysis which is further deepened using the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) techniques (Mashuri & Nurjannah, 2020). In the IFAS phase, researchers identified internal factors relevant to Service Planning and Architecture Strategy, such as the availability of IT service standards, service management maturity, IT architecture capabilities, and alignment with institutional strategy. Each factor was weighted based on its importance to the success of digital transformation, then given a rating that reflected the institution's actual condition. The weights and ratings were multiplied to obtain a weighted score, and the aggregated results were used to determine the position of internal strengths and weaknesses in supporting sustainable digital transformation.

Next, the EFAS analysis is used to evaluate external factors influencing digital transformation strategies, including opportunities and threats stemming

from the policy environment, technological developments, international cooperation, inter-university competition, and social and economic dynamics. The weighting and rating procedures for the EFAS are similar to those for the IFAS, resulting in a weighted score representing the level of external opportunities and threats. The IFAS and EFAS results are then combined to determine the strategic positioning coordinates of the institution in a SWOT diagram, which is used to identify the most appropriate strategy type, whether aggressive, turnaround, defensive, or diversified, within the context of Service Planning and Architecture.

To ensure that the resulting strategy is not only conceptual but also operational and implementable, this study continues the analysis with a priority analysis using the McFarlan Strategic Grid as proposed by Ward and Peppard. At this stage, various Service Planning and Architecture initiatives and strategies resulting from the SWOT analysis are mapped into four quadrants, namely Strategic, Key Operational (Key Performance), High Potential, and Support. This mapping allows researchers to identify initiatives that have a high strategic impact and should be prioritized immediately, compared to initiatives that are supporting or have long-term potential (Ward & Peppard, 2002). With this approach, the research not only produces recommendations for sustainable digital transformation strategies, but also provides a clear priority map for decision makers in managing Service Planning and Architecture Strategy adaptively according to the principles of Agile IT Governance.

### **Trustworthiness of the Study**

To ensure the quality and rigor of the research, this study applied trustworthiness principles, including credibility, dependability, confirmability, and transferability.

Credibility was maintained through triangulation of data sources, combining in-depth interviews with institutional document analysis and digital initiative mapping. Furthermore, the involvement of informants from various organizational levels, from strategic leaders to technical staff, enabled cross-confirmation of the research findings. The data saturation process also ensured that key themes were consistently identified before data collection ceased.

Dependability was achieved through the use of systematic data collection and analysis procedures, including a consistent semi-structured interview guide and a documented transcription and coding process. The use of qualitative analysis software supported traceability of the data interpretation process and maintained consistency of analysis.

Confirmability was strengthened by the application of coding by more than one researcher and the verification of interpretations through analytical discussions. Interview results were also compared with institutional document data to minimize subjective bias and ensure that findings were grounded in empirical evidence.

Transferability was supported through a clear presentation of the institutional context, including university characteristics, organizational structure, and the level of involvement of actors in digital transformation. This contextual presentation allows readers to assess the relevance of the research findings to other higher education institutions facing similar circumstances, particularly in developing countries.

Through this approach, the research seeks to ensure that the findings are not only internally valid but also have analytical value that can be considered within the broader context of higher education.

## RESULTS AND DISCUSSION

### Strategy for Implementing Service Planning and Architecture in Digital Transformation

Analysis of the digital transformation implementation strategy for the Service Planning & Architecture in higher education. The strategy analysis uses the SWOT method and the priority analysis uses the McFarlan Grid method. The SWOT analysis for the Service Planning & Architecture factor can be seen in Table 2.

**Table 2. SWOT Analysis of Service Planning and Architecture Factors**

	STRENGTH	WEAKNESS
SWOT	<ol style="list-style-type: none"> <li>Standards/SOPs for Information Technology Service Management are available at the University in accordance with university management.</li> <li>IT Quality Management is implemented effectively at the University.</li> <li>Information Technology Service Management is</li> </ol>	<ol style="list-style-type: none"> <li>The university does not yet have a standard for the Enterprise Architecture model.</li> <li>The university has not yet implemented the Information Technology Service Catalog Management system.</li> </ol>

---

available at the University and implemented in a well-planned and well-organized manner.

---

**OPPORTUNITY**

- |   |  |   |
|---|--|---|
| <ol style="list-style-type: none"> <li>1. The emergence of opportunities for B2B collaboration with various parties, both domestically and internationally, thereby increasing investment, research, etc.</li> <li>2. Opening opportunities for organizing international-scale events at universities.</li> </ol> | <ol style="list-style-type: none"> <li>1. Implementing superior quality assurance by evaluating and following up on development strategies utilizing various collaborations.</li> <li>2. Implementing a fast and streamlined IT-based bureaucracy and accelerating super-priority programs to achieve the university's vision.</li> <li>3. Publication and promotion internationally through various international communication channels, both multinational and bilateral, such as scientific conferences and collaborations.</li> </ol> | <ol style="list-style-type: none"> <li>1. Provide regular training and outreach on various programs leading to digital transformation to all stakeholders.</li> <li>2. Collaborate with various universities, both domestic and international, through outreach, international seminars, and workshops for stakeholders.</li> </ol> |
|---|--|---|

**THREAT**

- |   |  |   |
|---|--|---|
| <ol style="list-style-type: none"> <li>1. Political factors related to government instability, security, and the economy, leading to the cessation of research funding, etc.</li> <li>2. Changes in national and regional leadership, leading to shifts in national development priorities</li> <li>3. The absence of a long-term sustainable development direction that guarantees sustainability</li> </ol> | <ol style="list-style-type: none"> <li>1. Strengthening systems and maintaining stability to ensure the sustainability of digital transformation.</li> <li>2. Developing an IT master plan to realize long-term digital transformation and ensure its sustainability into the future.</li> </ol> | <ol style="list-style-type: none"> <li>1. Socialization and literacy on digital transformation by involving various parties, including lecturers, students, community leaders, and the media.</li> <li>2. Conducting in-depth studies on efficient and effective digital transformation at universities.</li> </ol> |
|---|--|---|
-

The results of this study indicate that higher education, particularly Manado State University, has a relatively strong internal foundation to drive sustainable digital transformation. Based on Table 2, the main strengths lie in the availability of IT Service Management standards and SOPs, consistent implementation of IT Quality Management, and well-planned IT service management practices. These findings reflect a fairly good level of digital service management maturity, an important prerequisite for successful digital transformation in higher education. Institutions with clear IT service standards tend to be better able to maintain the continuity of digital initiatives and minimize service fragmentation across units. In the context of service planning, this condition indicates that the university has entered the service-oriented organization stage, where digital services are no longer ad hoc but are designed to systematically support the institution's strategic objectives (Fernández et al., 2023).

However, the research findings, as outlined in Table 2, reveal significant strategic gaps, particularly the lack of enterprise architecture standards and suboptimal service catalog management. These weaknesses are structural and have the potential to hinder the long-term sustainability of digital transformation. Without a formal architectural framework, system integration, data interoperability, and consistent digital service development are vulnerable to duplication and asynchronous implementation. These findings align with other research confirming that many higher education institutions fail to maximize the value of digital transformation because IT architecture is treated as a technical issue, rather than an institutional strategy (Carmo et al., 2025) (Petchamé et al., 2023). Thus, architecture strategy should be positioned as the main enabler that bridges service planning with the vision of sustainable digital transformation.

Externally, the opportunities identified in Table 2 demonstrate a strategic environment that is highly conducive to strengthening service planning and architecture. Opportunities for international collaboration, the implementation of global academic activities, the acceleration of IT-based bureaucracy, and the strengthening of digital-based quality assurance are factors that can be leveraged to enhance the value of the university's digital services (Santos et al., 2019) (Pereira et al., 2023). These opportunities reinforce the argument that digital transformation in higher education is not solely internal, but also influenced by the institution's collaborative ecosystem and global reputation. Conversely, threats such as political instability, shifting development priorities, and unclear long-term development directions demonstrate that the sustainability of digital transformation depends heavily on strong governance and a clear digital roadmap. Institutions with adaptive

governance capabilities are better able to maintain consistent digital transformation despite dynamic external pressures (Tangi et al., 2021)(Bygstad et al., 2022).

Researchers began by identifying key internal factors contributing to the university's digital transformation. They then categorized these factors into strengths and weaknesses. The weight column represents the importance of each factor, with a weighting of 0.20 indicating very important, 0.1 indicating important, 0.05 indicating moderately important, 0.01 indicating unimportant, and a total of 1.00. The rating represents the internal condition of each organization. A score of 4 indicates excellent, 3 indicates good, 2 indicates average, and 1 indicates poor. Factors with values of 3 and 4 are assigned to strengths, while factors with values of 2 and 1 are assigned to weaknesses. The value of each factor is the product of the weight and the rating. Adding all the values together yields the SWOT analysis result for the strategy. See Table 3.

**Table 3. Strategy Service Planning & Architecture Priority Determination Calculation**

STRATEGY FACTORS	WEIGHT	SCORE	TOTAL (WEIGHT x SCORE))
<b>STRENGTHS (S)</b>			
1. Standards/SOPs are available for Information Technology Service Management at the University in accordance with the management at the university	0,2	4	0,8
2. IT Quality Management is implemented well by the University	0,2	4	0,8
3. Information Technology Management Services are available at the University which are implemented in a planned and well-planned manner.	0,2	3	0,6
Sub Total	<b>0,6</b>		<b>2,2</b>
<b>WEAKNESS (W)</b>			
1. The university does not yet have standards for the Enterprise Architecture model at the university.	0,2	2	0,4
2. Information Technology Service Catalog Management at the University has not been implemented properly.	0,2	2	0,4
Sub Total	<b>0,4</b>		<b>0,8</b>
<b>TOTAL (S+W)</b>	<b>1,00</b>		

<b>OPPORTUNITY (O)</b>			
1. The emergence of opportunities for good B2B cooperation with various parties both at home and abroad so that it can increase investment, research, etc.	0,2	4	0,8
2. Opening up opportunities to hold international scale events at universities.	0,2	3	0,6
Sub Total	<b>0,4</b>		<b>1,4</b>
<b>THREAT (T)</b>			
1. Political factors in government, security and economic instability which cause the cessation of research funding, etc.	0,2	2	0,4
2. Changes in national and regional leadership which have led to changes in national development priorities.	0,2	2	0,4
3. There is no long-term sustainable development direction that guarantees sustainability.	0,2	2	0,4
Sub Total	<b>0,6</b>		<b>1,2</b>
TOTAL (O+T)	<b>1,00</b>		

From the calculations in Table 3, the following analysis results were obtained:

Total strengths factor score = 2.2

Total weaknesses factor score = 0.8

Therefore, the formula used to determine the coordinates for internal factors is:

IFAS internal coordinates (internal factor strategy) = Total score of strengths factors - Total score of weaknesses factors

$$\text{IFAS} = 2,2 - 0,8 = 1,4$$

Thus, the true internal factor coordinate is 1.4

Next, an analysis was conducted to obtain the external coordinates, as follows:

Total factor opportunity score = 1.4

Total factor threats score = 1.0

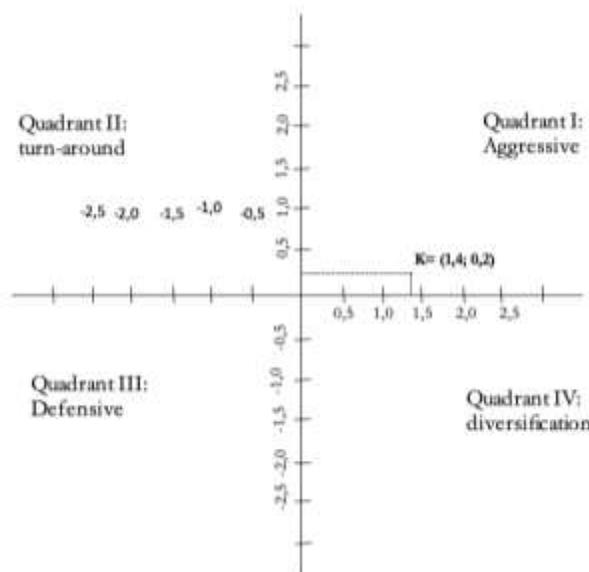
External factor strategy (EFAS) coordinates = Total factor opportunity score - Total factor threats score

$$\text{EFAS} = 1,4 - 1,2 = 0,2$$

Thus, the true external factor coordinate is 0.2.

The results in Table 3 reinforce these qualitative findings. The total strengths score of 2.2, which far exceeds the weaknesses score of 0.8, yields an IFAS score of 1.4, indicating the dominance of positive internal factors. This indicates that the university has sufficient internal capacity to exploit digital transformation opportunities. Meanwhile, the EFAS score of 0.2 indicates that although external opportunities outweigh threats, their impact is relatively moderate. This combination of IFAS and EFAS scores implies that digital transformation strategies need to focus on optimizing internal capabilities, particularly in service planning and architecture strategy, to respond to external opportunities selectively and sustainably. This approach is consistent with the resource-based view of digital transformation, which emphasizes the importance of internal capabilities as a source of long-term advantage (Singun, 2025)(Jackson, 2019).

After obtaining the coordinates for each factor, both internal and external, the next step is to determine the strategy by determining its quadrant position in the SWOT analysis diagram. This SWOT diagram determines the position of the strategy to be implemented, whether it falls into quadrants I, II, III, or IV. This quadrant serves to determine and identify whether the strategy is aggressive, diversified, turnaround, or defensive. The quadrant determination can be seen in Figure 1.



**Figure 1. Determining quadrants in the SWOT analysis of Service Planning & Architecture**

The coordinates (1.4; 0.2) in Figure 1 place the Service Planning and Architecture strategy in Quadrant I, or the aggressive strategy. This position has strong strategic implications, as it indicates that the university is in a position to proactively expand and deepen its digital transformation initiatives. An aggressive strategy in this context is not simply a technological expansion, but reflects a systematic effort to align digital service planning with the development of an integrated IT architecture. An aggressive strategy will be more effective if supported by flexible, collaborative, and feedback-based governance mechanisms, enabling the university to adapt quickly without losing its strategic direction (Sararuch et al., 2023).

This suggests that the resulting strategic priorities fall within quadrant I, thus resulting in an aggressive strategy. This means that the digital transformation implementation strategy has internal aspects that can be leveraged to seize and maximize identified opportunities, thereby increasing the effectiveness of the Service Planning & Architecture factor, and ensuring that this transformation is accepted and successfully implemented within the university.

Thus, a comprehensive analysis of Table 2, Table 3, and Figure 1 demonstrates that the Service Planning and Architecture factor plays a significant strategic role in driving sustainable digital transformation in higher education. Dominant internal strengths provide a strong foundation for an aggressive strategy, but long-term success depends heavily on the university's ability to close architectural gaps through the development of standardized and integrated enterprise architecture. This integration, when implemented within an agile IT governance framework, enables service planning and architecture strategy to function synergistically as key drivers of sustainable digital transformation, rather than simply as supporting technical instruments.

The findings of this research demonstrate that Service Planning and Architecture play a strategic role in driving sustainable digital transformation in higher education. The dominance of internal strengths, as demonstrated in the SWOT and IFAS analyses, indicates that universities have surpassed the basic technology adoption phase and are moving toward institutionalized digital services. The existence of IT Service Management standards and SOPs, consistent implementation of IT Quality Management, and planned IT service management practices indicate that digital transformation is no longer understood as a technology project, but rather as a service system embedded in the institution's core processes. These findings reinforce the literature stating that the success of digital transformation in higher education is largely determined by the maturity of service planning, not solely by the sophistication of the adopted technology (Fernández et al., 2023).

However, the research findings also reveal a crucial paradox in digital transformation strategies: robust service planning is not matched by a mature enterprise architecture. The lack of architectural standards and suboptimal service catalog management indicate that digital transformation still risks being fragmented and fragmented. From a strategic perspective, this situation has the potential to create so-called digital silos, where digital services develop rapidly but are not structurally integrated. This aligns with the finding that many higher education institutions fail to maintain the sustainability of their digital transformation because IT architecture is not positioned as an organizational strategy, but rather as a technical domain separate from service planning (Carmo et al., 2025).

From a service planning perspective, the lack of standardized enterprise architecture weakens universities' ability to ensure consistent user experience, system interoperability, and the future scalability of digital services. In other words, these findings suggest that robust service planning without a well-developed architecture strategy will only yield short-term success. Therefore, this research strengthens the argument that architecture strategy should be understood as a structural mechanism that mediates and strengthens service planning's influence on sustainable digital transformation, rather than simply as a supporting technical layer.

Analysis of external factors indicates that universities' strategic environment is relatively conducive to accelerating digital transformation through leveraging international collaboration opportunities, digitizing bureaucracy, and strengthening IT-based quality assurance systems. These findings confirm that digital transformation in higher education is increasingly influenced by external pressures such as global reputation, international academic networks, and demands for public accountability. However, threats such as policy instability, political dynamics, and the unclear direction of long-term development indicate that the sustainability of digital transformation cannot be separated from the quality of governance. In this context, service planning and architecture must be designed not only to be adaptive to opportunities but also resilient to external environmental uncertainties, as emphasized in studies of digital transformation in the public sector and higher education (Tangi et al., 2021).

An IFAS score of 1.4 and an EFAS score of 0.2, which places the strategy in Quadrant I, indicates that the university is in a strategic position that allows for the implementation of an aggressive strategy. However, this finding needs to be interpreted with caution. An aggressive strategy in the context of Service Planning and Architecture should not be interpreted as uncontrolled technological expansion, but rather as targeted acceleration based on

strengthening the architectural and governance foundations. This research shows that strategic aggressiveness will only generate sustainable value if the university simultaneously develops standardized enterprise architecture and a well-documented service catalog. Without this, an aggressive strategy has the potential to increase system complexity and future operational burdens.

Priority analysis using the McFarlan Grid deepens understanding of how the Service Planning and Architecture strategy should be implemented in a phased and realistic manner. The dominance of strategies in the Strategic and Key Performance quadrants indicates that the university's primary focus is on initiatives that directly impact institutional value and core service performance. The development of a long-term IT master plan and strengthening digital-based quality assurance, both categorized as strategic, indicate the institution's awareness that digital transformation requires a clear long-term direction. Meanwhile, High Potential strategies such as training and socialization of digital transformation show that the human capability aspect is still seen as an important investment, even though the impact is medium-term.

Conceptually, the findings of this research make an important contribution to the development of digital transformation theory in higher education by emphasizing that service planning and architecture strategy are not two separate domains, but rather form a mutually reinforcing causal and structural relationship. This research also expands the discourse on agile IT governance by demonstrating that the role of agility lies not only in the decision-making process, but also in the ability to orchestrate service planning and architecture in an adaptive and sustainable manner. These findings align with other research emphasizing that agile architecture will only be effective when integrated with the service needs and governance of the institution (Sararuch et al., 2023). Overall, this research confirms that the success of sustainable digital transformation in higher education is largely determined by the institution's ability to align value-oriented Service Planning with a structured Architecture Strategy, within an adaptive Agile IT Governance framework. The research findings not only enrich theoretical understanding but also provide a strong empirical basis for university leaders to design digital transformation strategies that are not reactive, but rather planned, integrated, and sustainable.

Interviews with 12 key informants indicate that the university's digital transformation is in the operational strengthening phase, with relatively strong internal support. However, it still faces structural challenges in service integration and IT architecture maturity.

### ***Digital Service Status***

All respondents acknowledged that digital services have developed significantly to support academic and administrative activities. Academic systems, online learning, and financial administration are the most dominant initiatives. However, digital service development tends to be driven by the operational needs of work units rather than the results of long-term strategic planning.

Approximately 70% of the digital initiatives developed focus on improving operational efficiency, such as student data management, learning processes, and internal administration. Only a small proportion of initiatives are designed as part of an integrated institutional transformation strategy.

### ***Internal Strengths***

Most respondents emphasized that leadership commitment is a key internal strength in driving digitalization. Internal policy support, technical human resource readiness, and user acceptance of technology are significant supporting factors. These findings indicate that the university has a strong organizational foundation to continue its digital transformation.

### ***Structural Weaknesses***

Despite dominant internal strengths, respondents consistently identified weaknesses in structural aspects, particularly related to:

1. lack of formal enterprise architecture
2. system fragmentation between units
3. limited data integration
4. sectoral service development

Nine of 12 respondents stated that system development governance is still based on unit needs, rather than a unified institutional framework. This condition results in variations in system standards and limited interoperability.

### ***External Opportunities***

Respondents identified opportunities from national policies encouraging the digitalization of higher education and the development of cloud-based technologies that enable service development without reliance on large local infrastructure.

### ***External Threats***

The main threats identified include:

1. limited public funding
2. data security risks
3. dependence on external vendors

These factors have the potential to impact the sustainability of digital transformation if not addressed through strategic planning.

### ***Governance and Integration Needs***

All respondents emphasized that current IT governance remains sectoral. Decision-making regarding digital service development is often done reactively to operational needs. This situation indicates a gap between service planning and IT architecture development.

All respondents stated the need for:

1. integration between service planning and IT architecture
2. clearer architectural standards
3. adaptive governance mechanisms

### ***Implications for Digital Transformation***

Interview findings indicate that universities possess significant internal strengths, but digital transformation is still dominated by operational initiatives. The lack of integration between service planning and IT architecture is a limiting factor in achieving sustainable transformation.

This finding is consistent with the results of the SWOT and IFAS–EFAS analyses, which place universities in a position dominated by internal strengths, but still require an integrative strategy to maximize external opportunities.

### **Implementation of Priority Strategy Using McFarlan Grid Method**

The results of this study analyze priority strategies using the McFarlan Strategic Grid method. This method can be an IT portfolio management tool that maps the role and value of IT systems/services based on their impact on current operations and their strategic potential in the future. To be able to sequence strategies on Service Planning & Architecture factors in a realistic manner that can be implemented, the researcher used the McFarlan Grid method (Ward & Peppard, 2002). Using this method, researchers derived strategies based on strategic value (S), key performance (K), high potential (H), and support (U). More details can be seen in Table 4.

**Table 4. Service Planning & Architecture Priority Strategy Analysis**

No	STRATEGY	PRIORITY
1.	Implementation of superior quality assurance by evaluating and following up on development strategies by utilizing various collaborations.	<b>S</b>
2.	Implementation of fast and simple IT-based bureaucracy and acceleration programs on super priority programs to achieve the university's vision.	<b>K</b>
3.	Publication and promotion in the international world through various international communication channels, both multinational and bilateral, such as scientific conferences and collaborations.	<b>S</b>
4.	Provide training and outreach on various programs towards digital transformation to all stakeholders on a regular basis.	<b>H</b>
5.	Collaboration with various campuses both domestically and abroad through outreach, international seminars and workshops for stakeholders	<b>K</b>
6.	Strengthening systems and maintaining stability to ensure the sustainability of digital transformation	<b>U</b>
7.	Development of an IT master plan to realize long-term digital transformation and ensure its sustainability in the future.	<b>S</b>
8.	Socialization and literacy about digital transformation by involving various parties, lecturers, students, community leaders and the media.	<b>K</b>
9.	Conducting in-depth studies on efficient and effective digital transformation in universities.	<b>K</b>

The results of this study show that in Table 4, the researcher grouped various components of the university's digital services according to the McFarlan Grid method, then placed them in different implementation strategies. The placement of elements in these quadrants reflects how these digital services

are viewed in the context of strategic planning and IT architecture as the foundation of digital transformation. In the strategy formulation in Table 4, it was found that in the Service Planning & Architecture factor, there are three strategic strategies that are a top priority to be implemented immediately and cannot be postponed, four key performance strategies that are key to ensuring that the strategy is important to implement but not yet urgent. There is also one high potential strategy that is important to implement but can still be postponed for implementation in the near future. The final strategy that can be produced is a support strategy. In the priority analysis carried out, there is one support strategy, meaning that the strategy is not too important but will be very helpful if implemented.

In the context of sustainable digital transformation in higher education, the implementation of the McFarlan Grid provides two key insights. First, it reveals the level of institutional readiness and focus on digital applications or services based on their tangible contribution to future academic and strategic operations. Services mapped in the Strategic quadrant represent systems critical to the institution's digital transformation trajectory (e.g., learning management systems, educational data analytics, or research collaboration platforms). These components reflect significant investment in architectural integration and support long-term goals such as improving educational quality, academic reputation, or AI-based data management. The results of this study demonstrate that digital transformation in higher education emphasizes the role of such strategic systems as a basis for improving institutional performance and responding to the dynamics of the global education market (Carmo et al., 2025)(Novikov et al., 2022). Second, the McFarlan Grid portfolio has identified areas with high potential but that are not yet fully exploited. This includes services that may not have a significant impact on current operations but have the potential to create competitive advantage in the future. This is evident in university settings, such as the use of predictive analytics to improve student retention or AI-based adaptive education systems(Lakshmi et al., 2023). This identification is important because a sustainable digital transformation strategy focuses not only on operational efficiency but also on creating innovation-driven value relevant to the development of the digital era. The results of this study indicate that the potential for IT innovation, such as data-informed decision-making, is considered a crucial element for sustainable institutional change (Alfred et al., 2025).

The analysis results in Table 4 emphasize that it is not just the quantitative mapping of applications that is important, but also the strategic implications for service architecture and IT governance. Services placed in the key operational quadrant represent systems critical to the continuity of academic

and administrative processes, such as registration, finance, and human resource management systems. The effectiveness of these services is an operational foundation that must be tightly integrated within a centralized and modular IT architecture framework to serve as the backbone of a transformation enabler. This integration also aligns with research showing that sound IT service planning and architecture are prerequisites for achieving operational performance that supports sustainable digital transformation (Julia et al., 2018). The impact of the McFarlan Grid methodology on governance is also significant. This approach encourages university leaders to allocate resources based on strategic value rather than solely operational needs. This is consistent with the principles of effective IT governance, where IT investment decisions and priorities are guided by an assessment of their value against long-term institutional goals. Academic literature on IT governance confirms that senior leadership involvement in IT portfolio decision-making improves alignment between IT investments and the institution's strategic objectives, including digital transformation goals (Alfred et al., 2025)(Jackson, 2019).

The results of this study indicate that the digital transformation strategy mapping using the McFarlan Strategic Grid method in Table 4 demonstrates that the university's portfolio of services and information systems is unevenly distributed across the four quadrants, with dominance in the Strategic and Key Operational quadrants. This finding indicates that the institution has entered a value-oriented digital transformation phase, where information technology is no longer merely supporting administrative activities but is beginning to be positioned as a key driver for achieving higher education's strategic goals. In the context of Sustainable Digital Transformation, this configuration reflects a relatively high level of organizational awareness of the strategic role of digital services in enhancing institutional competitiveness and the quality of academic services.

In the Strategic quadrant, the mapped services and systems represent initiatives that have a significant impact on the university's long-term direction. The existence of an IT master plan, a digital-based quality assurance system, and integrated academic services demonstrates that digital transformation is understood as a strategic agenda for the institution. This finding aligns with other research confirming that strategic information systems in higher education function as value enablers that connect the institution's vision with operational practices through the utilization of data, digital platforms, and an integrated service architecture (Vial, 2019)(Limani et al., 2019). From an IT Governance perspective, the placement of initiatives in this quadrant also reflects the initial alignment between business strategy and IT strategy, although it is not yet fully

supported by mature enterprise architecture standards (Vejseli & Rossmann, 2018) (Polin et al., 2023).

The results of this study also show that the Key Operational quadrant in Table 4 is dominated by systems that support the continuity of daily academic and administrative processes, such as academic, financial, and personnel systems. The dominance of these key operational systems confirms that the university's digital foundation has been established and is relatively stable. However, from the perspective of sustainable digital transformation, high reliance on operational systems without strong architectural integration has the potential to create structural rigidity. This is in line with the digital transformation emphasis that operational systems must be designed modularly and interoperably to adapt to changing service needs in the future (Bharadwaj et al., 2013). Therefore, these findings suggest that the sustainability of digital transformation is highly dependent on the university's ability to transform operational systems into part of more flexible service architecture.

The research results also show that the High Potential quadrant in Table 4 reflects initiatives that have not yet had a significant impact but have medium- to long-term strategic potential. Initiatives such as digital transformation training, strengthening IT literacy among academics, and exploring innovative digital services demonstrate institutional awareness of the importance of human capabilities as an enabler of digital transformation (Kuhn & Lucke, 2021). These findings reinforce the view that the success of digital transformation in higher education is not only determined by technology, but also by the readiness of the organization and human resources to adopt and utilize the technology meaningfully (Kane et al., 2015) (Carlisle et al., 2021). However, this High Potential position indicates that investment in digital capabilities has not been fully integrated into the architecture and governance strategy, so the impact is still latent.

Meanwhile, the results of this study indicate that the Support quadrant includes systems and services that have limited contributions to strategic advantage or innovation. The presence of systems in this quadrant does not constitute a weakness, but rather reflects the need for IT portfolio rationalization. In the context of Agile IT Governance, support systems need to be managed efficiently and standardized to avoid absorbing strategic resources that should be allocated to high-value initiatives (Vejseli & Rossmann, 2018). This finding is consistent with modern IT governance principles that emphasize differentiation of portfolio management based on strategic value, rather than a uniform approach to the entire system (Weill, P., Ross, 2004) (De Haes et al., 2020).

Comprehensively, the McFarlan Grid analysis results in Table 4 confirm that the university is in a critical transition phase in its digital transformation. The dominance of the Strategic and Key Operational quadrants indicates strong structural and operational readiness, but this is not yet fully supported by the systemic integration of service planning and architecture strategy. Within the Agile IT Governance framework, this finding implies that the primary challenge is no longer technology adoption, but rather the adaptive and sustainable orchestration of the service portfolio and IT architecture. Thus, the McFarlan Grid serves not only as a mapping tool but also as a reflective instrument for evaluating the consistency between service strategy, IT architecture, and long-term digital transformation goals (De Haes et al., 2020).

The results of this study indicate that, based on the analysis in Table 4, universities are advised to prioritize strengthening enterprise architecture as a bridge between Strategic and Key Operational systems. This integration is crucial to ensure that core operational systems are able to support strategic innovation without causing fragmentation. Furthermore, initiatives in the High Potential quadrant need to be elevated through policies that link digital capability development to the institution's digital transformation roadmap. This approach will accelerate the conversion of potential into tangible strategic value. The implementation of Agile IT Governance needs to be directed at IT portfolio management based on a continuous evaluation cycle. Each digital initiative should be periodically evaluated to assess its shifting position within the McFarlan Grid, so that IT investment and development decisions remain aligned with the dynamics of the institution's needs and the external environment. With this strategy, universities can ensure that digital transformation does not stop at short-term success, but develops sustainably and purposefully (Nugroho et al., 2025).

The findings of this study indicate that digital transformation at universities is not entirely limited by internal capacity, but rather by structural gaps in the integration of service strategy and technology development. Interviews with key informants indicated that institutions have relatively strong internal foundations, particularly in the form of leadership commitment and organizational readiness to adopt digital technology. This position places universities in a position to internally support transformation, as reflected in the dominance of strengths in the IFAS analysis.

However, the predominance of digital initiatives focused on operational needs indicates that digitalization remains adaptive and responsive, rather than transformational. While the development of academic, administrative, and learning service systems has increased work process efficiency, it has not yet fully led to structural changes in institutional governance. This confirms that

digital transformation is determined not only by the availability of technology, but by the institution's ability to strategically integrate service planning with IT architecture. The absence of a formal enterprise architecture emerged as a critical finding in this study. The system fragmentation identified by most respondents indicates that digital service development is still sector-based. Without a clear architectural framework, integration between systems is limited, potentially creating duplication of functions and inefficient resource utilization. This situation demonstrates a gap between service planning and IT development, ultimately limiting the strategic impact of digital transformation.

Furthermore, unit-driven IT governance reinforces the tendency for reactive decision-making to address operational needs. While this flexibility allows for rapid response to user needs, this approach does not always align with long-term institutional goals. Without adaptive governance mechanisms, universities risk underutilizing their potential internal strengths in the face of external challenges such as limited public funding and increasing data security risks. Conversely, the external environment provides significant opportunities through national policies on digitalizing higher education and the development of cloud-based technologies. However, these opportunities can only be optimally utilized if supported by an integrated service strategy, IT architecture, and institutional governance. Sustainable digital transformation therefore requires an approach that focuses not only on technology implementation but also on aligning organizational structures and decision-making mechanisms.

Overall, the findings of this study confirm that digital transformation in the context of public higher education requires a shift from a project-based approach to an architecture- and governance-based approach. Integration between service planning, IT architecture and governance is a key prerequisite for ensuring that an institution's internal strengths can be strategically leveraged in the face of external dynamics.

## **CONCLUSION**

This study concludes that the success of sustainable digital transformation in higher education is largely determined by the institution's ability to strategically integrate service planning and architecture strategy within an Agile IT Governance framework. Empirical findings indicate that universities have strong internal foundations, characterized by mature IT service management, the implementation of IT Service Management standards and SOPs, and consistent quality management practices, enabling the implementation of an aggressive digital transformation strategy. However, the absence of enterprise architecture standards and suboptimal service catalog management reveal structural gaps that could potentially hinder the long-term

sustainability of digital transformation. The results of the SWOT and IFAS–EFAS analyses place the strategy in Quadrant I, indicating that accelerated digital transformation is highly possible, but must be implemented in a targeted manner and based on adaptive governance. Furthermore, priority mapping using the McFarlan Strategic Grid indicates the dominance of initiatives in the Strategic and Key Operational quadrants, confirming that information technology has transformed from a supporting function to a primary driver of institutional value creation. Conceptually, this study confirms that service planning acts as a guide for stakeholder values and needs, architecture strategy serves as a structural foundation that ensures integration and scalability, while Agile IT Governance acts as a dynamic mechanism that enables all three to converge adaptively. Thus, sustainable digital transformation in higher education cannot be achieved through a partial or technological approach alone, but rather requires strategic orchestration between service planning, IT architecture, and agile governance to ensure the continuity of value, organizational resilience, and institutional competitiveness in the future.

This study also concludes that digital transformation in higher education is not solely determined by the availability of technology, but by the institution's ability to strategically integrate service planning, IT architecture, and governance. This finding reinforces the argument in the literature that sustainable digital transformation requires alignment between organizational strategy and technology structure, not just operational system implementation. Consistent with previous studies highlighting the importance of governance in the digitalization of higher education, this study shows that the dominance of operational initiatives remains a common pattern in public institutions. However, unlike studies that position technology as the primary driver of transformation, this finding confirms that the absence of a formal enterprise architecture is a major limiting factor in digital service integration. This suggests that architectural maturity plays an equally important role as technology investment in driving institutional change. The finding that approximately 70% of digital initiatives are operationally oriented is an unexpected result, given the strong leadership commitment to digital transformation. This situation suggests that strategic support at the leadership level has not automatically translated into structural integration in digital service development. This gap between commitment and implementation indicates the importance of governance mechanisms that can link service planning with technology development. Theoretically, this study broadens the understanding of digital transformation in higher education by emphasizing the importance of integrating service planning and IT architecture within an adaptive governance framework. The approach, which combines SWOT analysis, IFAS–EFAS, and portfolio mapping, provides

a systemic perspective on how internal strengths can be leveraged to maximize external opportunities in the context of public institutions.

### **Acknowledge Limitations**

Practically, the findings of this study imply that universities need to develop enterprise architecture as a foundation for digital service integration. Furthermore, cross-unit governance mechanisms are crucial to ensure that technology investments support the institution's strategic objectives. Strengthening human resource capacity and implementing portfolio-based prioritization are also necessary to reduce the dominance of short-term initiatives.

These research findings have relevance beyond the context of a single university. Many public universities in developing countries face similar challenges in integrating service and technology strategies amidst resource constraints. Therefore, the integration of service planning, IT architecture, and adaptive governance can be a critical framework for supporting sustainable digital transformation in the higher education sector more broadly.

### **Future Research**

This research has limitations due to its use of a single case study approach, so generalization of the findings should be done with caution. Furthermore, the analysis focused on managerial and technical perspectives without directly involving the experiences of digital service users more broadly.

Future research is recommended to explore comparisons across higher education institutions, examine the role of organizational culture in technology adoption, and develop a more contextualized model of integration between IT architecture and governance for developing countries.■

### **REFERENCES**

- ADB. (2022). Digital transformation in Southeast Asia's higher education systems. Asian Development Bank
- Alfred, P., Mabothe, P. & Ngcamu, B. S. (2025). Digital Transformation in the Higher Education Sector: A Systematic Literature Review. *Administrative Sciences*, 16(1), 1–23.
- Amorim, A. C., Mira da Silva, M., Pereira, R. & Gonçalves, M. (2021). Using agile methodologies for adopting COBIT. *Information Systems*, 101, 101496. <https://doi.org/https://doi.org/10.1016/j.is.2020.101496>
- Banaeianjahromi, N., & Smolander, K. (2019). Enterprise architecture adoption challenges in emerging economies. *Information Systems Frontiers*, 21(2),

345–358

- Bharadwaj, A., El Sawy, O., Pavlou, P. & Venkatraman, N. (2013). Digital Business Strategy: Toward a Next Generation of Insights. *MIS Quarterly*, 37(2), 471–482.
- Bygstad, B., Øvrelid, E., Ludvigsen, S. & Dæhlen, M. (2022). From dual digitalization to digital learning space: Exploring the digital transformation of higher education. *Computers & Education*, 182, 104463. <https://doi.org/https://doi.org/10.1016/j.compedu.2022.104463>
- Carlisle, S., Ivanov, S. & Dijkmans, C. (2021). The digital skills divide: evidence from the European tourism industry. *Journal of Tourism Futures*. <https://doi.org/10.1108/JTF-07-2020-0114>
- Carmo, J. E. S., Lacerda, D. P., Klingenberg, C. O. & Piran, F. A. S. (2025). Digital transformation in the management of higher education institutions. *Sustainable Futures*, 9(September 2024), 100692. <https://doi.org/10.1016/j.sftr.2025.100692>
- David, R. . F. & David, R. F. (2017). *Strategic Managemen, 16th Global Edition*. [www.ebook3000.com](http://www.ebook3000.com)
- De Haes, S., Van Grembergen, W., Anant, J. & Huygh, T. (2020). Enterprise Governance of Information Technology. Achieving Alignment and Value in Digital Organizations. In *Springer Nature Switzerland AG*. [https://doi.org/10.1007/978-3-030-25918-1\\_5](https://doi.org/10.1007/978-3-030-25918-1_5)
- Diogo, R. A., dos Santos, N. & Loures, E. F. R. (2023). 13 - Digital Transformation of Engineering Education for Smart Education: A systematic literature review. In M. Ram & L. B. T.-R. M. in I. 4. . Xing (Eds.), *Advances in Reliability Science* (pp. 407–438). Elsevier. <https://doi.org/https://doi.org/10.1016/B978-0-323-99204-6.00002-9>
- Fernández, A., Gómez, B., Binjaku, K. & Kajo, E. (2023). Digital transformation initiatives in higher education institutions : A multivocal literature review. In *Education and Information Technologies* (Vol. 28, Issue 10). Springer US. <https://doi.org/10.1007/s10639-022-11544-0>
- FME. (2013). SWOT Analysis: Strategy Skills. In *Free-Managment-Ebooks*.
- Jackson, N. C. (2019). Managing for competency with innovation change in higher education: Examining the pitfalls and pivots of digital transformation. *Business Horizons*, 62(6), 761–772. <https://doi.org/https://doi.org/10.1016/j.bushor.2019.08.002>
- Julia, K., Kurt, S. & Ulf, S. (2018). How digital transformation affects enterprise

- architecture management – A case study. *International Journal of Information Systems and Project Management*, 6(3), 5–18.  
<https://doi.org/10.12821/ijispm060301>
- Kane, G. C., Palmer, D., Phillips, A. N., Kiron, D. & Buckley, N. (2015). Strategy, not Technology, Drives Digital Transformation: Becoming a Digitally Mature Enterprise. *MIT Sloan Management Review*, 14(1), 1–25.  
<https://doi.org/10.1176/appi.ajp.159.9.1620>
- Kemendikbudristek. (2021). Transformasi digital pendidikan tinggi melalui kebijakan Merdeka Belajar Kampus Merdeka. Jakarta: Ministry of Education, Culture, Research and Technology.
- Kuhn, C. & Lucke, D. (2021). Supporting the Digital Transformation: A Low-Threshold Approach for Manufacturing Related Higher Education and Employee Training. *Procedia CIRP*, 104, 647–652.  
<https://doi.org/https://doi.org/10.1016/j.procir.2021.11.109>
- Lakshmi, A. J., Kumar, A., Kumar, M. S., Patel, S. I., Naik, S. K. L. & Ramesh, J. V. N. (2023). Artificial intelligence in steering the digital transformation of collaborative technical education. *The Journal of High Technology Management Research*, 34(2), 100467.  
<https://doi.org/https://doi.org/10.1016/j.hitech.2023.100467>
- Limani, Y., Hajrizi, E., Stapleton, L. & Retkoceri, M. (2019). Digital Transformation Readiness in Higher Education Institutions (HEI): The Case of Kosovo. *IFAC-PapersOnLine*, 52(25), 52–57.  
<https://doi.org/https://doi.org/10.1016/j.ifacol.2019.12.445>
- Mashuri, M. & Nurjannah, D. (2020). Analisis SWOT Sebagai Strategi Meningkatkan Daya Saing. *JPS (Jurnal Perbankan Syariah)*, 1(1), 97–112.  
<https://doi.org/10.46367/jps.v1i1.205>
- Nermend, M., Singh, S. & Singh, U. S. (2022). An evaluation of decision on paradigm shift in higher education by digital transformation. *Procedia Computer Science*, 207, 1959–1969.  
<https://doi.org/https://doi.org/10.1016/j.procs.2022.09.255>
- Novikov, S., Balashova, E. & Schislyaeva, E. (2022). Digital transformation project for transportation professionals. *Transportation Research Procedia*, 63, 2122–2129. <https://doi.org/https://doi.org/10.1016/j.trpro.2022.06.238>
- Nugroho, Y. A., Widodo, A., Pebrina, E. T. & Iskandar, J. (2025). Digitalization in Higher Education : How Information Systems Improve Operational and Strategic Performance. *Indonesian Journal of Management and Economic Research*, 03(01), 90–98.

- Olsen, D. H. & Trelsgård, K. (2016). Enterprise Architecture Adoption Challenges: An exploratory Case Study of the Norwegian Higher Education Sector. *Procedia Computer Science*, 100, 804–811. <https://doi.org/https://doi.org/10.1016/j.procs.2016.09.228>
- Pereira, D. S. M., Falcão, F., Costa, L., Lunn, B. S., Pêgo, J. M. & Costa, P. (2023). Here's to the future: Conversational agents in higher education- a scoping review. *International Journal of Educational Research*, 122, 102233. <https://doi.org/https://doi.org/10.1016/j.ijer.2023.102233>
- Petchamé, J., Iriondo, I., Korres, O. & Paños-Castro, J. (2023). Digital transformation in higher education: A qualitative evaluative study of a hybrid virtual format using a smart classroom system. *Heliyon*, 9(6), e16675. <https://doi.org/https://doi.org/10.1016/j.heliyon.2023.e16675>
- Pham, H., Tran, Q.-N., La, G.-L., Doan, H.-M. & Vu, T.-D. (2021). Readiness for digital transformation of higher education in the Covid-19 context: The dataset of Vietnam's students. *Data in Brief*, 39, 107482. <https://doi.org/https://doi.org/10.1016/j.dib.2021.107482>
- Polin, K., Yigitcanlar, T., Limb, M. & Washington, T. (2023). The Making of Smart Campus: A Review and Conceptual Framework. *Buildings*, 13(4). <https://doi.org/10.3390/buildings13040891>
- Prasetyo, A. B. (2018). Strategi Perencanaan Sistem Informasi Dan Teknologi Informasi Di Lingkungan Perguruan Tinggi. *Journal of Applied Informatics and Computing*, 2(2), 24–28. <https://doi.org/10.30871/jaic.v2i2.1033>
- Purwanto, H., Rahayu, A., Gaffar, V., Adi Wibowo, L., Azizah Asmara, M., Munawar, A. & Saepudin, D. (2024). Strategic Alignment for Higher Education'S Digital Transformation Journey. *Trikonomika*, 23(2), 83–97. <https://doi.org/10.23969/trikononika.v23i2.18940>
- Raharjo, B., Wahyudi, A., & Nugroho, Y. (2022). Cultural determinants of technology adoption in Indonesian public institutions. *Technology in Society*, 68, 101821.
- Sanchez-Puchol, F., Pastor-Collado, J. A. & Borrell, B. (2017). Towards an Unified Information Systems Reference Model for Higher Education Institutions. *Procedia Computer Science*, 121, 542–553. <https://doi.org/https://doi.org/10.1016/j.procs.2017.11.072>
- Santos, H., Batista, J. & Marques, R. P. (2019). Digital transformation in higher education: the use of communication technologies by students. *Procedia Computer Science*, 164, 123–130. <https://doi.org/https://doi.org/10.1016/j.procs.2019.12.163>

- Sararuch, S., Wannapiroon, P. & Nilsook, P. (2023). The Development of Agile Enterprise Architecture for Digital Transformation in Higher Education Institutions. *Higher Education Studies*, 13(3), 69. <https://doi.org/10.5539/hes.v13n3p69>
- Singun, A. J. (2025). Unveiling the barriers to digital transformation in higher education institutions : a systematic literature review. In *Discover Education* (Issue MI). Springer International Publishing. <https://doi.org/10.1007/s44217-025-00430-9>
- Suryadi, A., & Tilaar, H. A. R. (2021). Governance and funding challenges in Indonesian public universities. *Higher Education Policy*, 34(3), 567–584
- Tamm, T., Seddon, P. B. & Shanks, G. (2022). How enterprise architecture leads to organisational benefits. *International Journal of Information Management*, 67, 102554. <https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2022.102554>
- Tangi, L., Janssen, M., Benedetti, M. & Noci, G. (2021). Digital government transformation: A structural equation modelling analysis of driving and impeding factors. *International Journal of Information Management*, 60(April), 102356. <https://doi.org/10.1016/j.ijinfomgt.2021.102356>
- Tsilionis, K. & Wautelet, Y. (2022). A model-driven framework to support strategic agility: Value-added perspective. *Information and Software Technology*, 141, 106734. <https://doi.org/https://doi.org/10.1016/j.infsof.2021.106734>
- Tuha, P. T. & Oktabian, R. H. (2020). PERSPEKTIF AGILE UNTUK PENGEMBANGAN SUMBER DAYA MANUSIA. *Jurnal Ekonomi Dan Manajemen STIE Pertiba Pangkalpinang*, 8(2), 24–36.
- Vejseli, S. & Rossmann, A. (2018). Towards agility in IT governance frameworks. In *Lecture Notes in Business Information Processing* (Vol. 320). Springer International Publishing. [https://doi.org/10.1007/978-3-319-93931-5\\_6](https://doi.org/10.1007/978-3-319-93931-5_6)
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Wang, K., Li, B., Tian, T., Zakuan, N. & Rani, P. (2023). Evaluate the drivers for digital transformation in higher education institutions in the era of industry 4.0 based on decision-making method. *Journal of Innovation & Knowledge*, 8(3), 100364. <https://doi.org/https://doi.org/10.1016/j.jik.2023.100364>

- Ward, J. & Peppard, J. (2002). Strategic planning for an information system. In *John Wiley & Sons Ltd: Vol. Third Edit.* [https://doi.org/10.1016/0024-6301\(90\)90122-k](https://doi.org/10.1016/0024-6301(90)90122-k)
- Wautelet, Y. (2019). A model-driven IT governance process based on the strategic impact evaluation of services. *Journal of Systems and Software*, 149, 462–475. <https://doi.org/https://doi.org/10.1016/j.jss.2018.12.024>
- Weill, P., Ross, J. (2004). *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results*. Harvard Business School Press.
- Widjajarto, A., Lubis, M. & Yunan, U. (2019). Architecture Model of Information Technology Infrastructure based on Service Quality at Government Institution. *Procedia Computer Science*, 161, 841–850. <https://doi.org/https://doi.org/10.1016/j.procs.2019.11.191>
- World Bank. (2020). Indonesia digital economy and higher education readiness report. Washington, DC: World Bank.
- Zhukabayeva, T., Baumuratova, D., Zholshiyeva, L., Karabay, A. & Abdrakhmanov, K. (2025). Digital Transformation in Higher Education : Toward a National Model of Digital University in Kazakhstan Through Global and Local Comparison. *Sustainability*, 17(24), 1–31.

**This page belongs to the Tadbir : Jurnal Studi Manajemen Pendidikan**

Tadbir : Jurnal Studi Manajemen Pendidikan Vol. 10, No.2, May 2026

**IAIN Curup –Bengkulu | p-ISSN 2580-3581; e-ISSN 2580-5037**