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Agile IT Governance for Sustainable Digital Transformation in Universities

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ABSTRACT

The increasing demand for sustainable digital transformation in higher education requires governance models that are adaptive, flexible, and resilient. Traditional IT governance frameworks often lack the agility to respond to rapidly changing technological, institutional, and societal needs. This study explores the application of Agile IT Governance as a strategic approach to support sustainable digital transformation in universities. Using a mixed-methods design, the research combines a systematic literature review with empirical insights from case studies conducted in Indonesian universities. The findings reveal that Agile IT Governance enables faster decision-making, promotes stakeholder collaboration, and strengthens the alignment between institutional objectives and technological innovations. Furthermore, the study highlights the critical enablers of successful implementation, including leadership commitment, organizational culture, digital competencies, and adaptive policy frameworks. This research contributes to the theoretical advancement of IT governance by integrating agile principles into the context of higher education, while also providing practical recommendations for policymakers and university leaders seeking to ensure long-term digital sustainability.

Keywords: Agile IT Governance, digital transformation, higher education, Indonesia sustainability

INTRODUCTION

The rapid advancement of digital technologies has transformed the landscape of higher education, pushing universities to adopt innovative strategies that ensure sustainability, competitiveness, and resilience. Digital transformation is no longer a choice but a necessity, as universities are increasingly expected to deliver high-quality education, efficient administration, and impactful research through digital platforms (Al-Kahtani et al., 2022). However, while the potential of digital technologies in higher education is immense, their successful integration depends heavily on effective information technology (IT) governance.

Traditional IT governance frameworks, such as COBIT or ITIL, provide structured processes for managing IT resources, risks, and alignment with institutional goals. Yet, these frameworks are often criticized for being rigid, hierarchical, and slow to adapt to the dynamic nature of digital change (De Haes & Van Grembergen, 2015). In contrast, universities today require governance models that are not only structured but also flexible and responsive to emerging challenges. The COVID-19 pandemic, for example, highlighted the urgent need for agile decision-making and rapid technological adaptation in higher education (Bond et al., 2021). Agile IT Governance emerges as a promising paradigm that integrates agile principles, such as adaptability, collaboration, iterative improvement, and stakeholder involvement, into IT governance practices. By embedding agility, universities can accelerate decision-making processes, enhance collaboration among academic and administrative stakeholders, and foster innovation that aligns with long-term institutional sustainability (Niemimaa et al., 2019). Moreover, Agile IT Governance supports continuous adaptation to regulatory, technological, and societal shifts, making it highly relevant for universities in developing contexts such as Indonesia.

One of the main challenges facing higher education institutions in their efforts to achieve sustainable digital transformation is the rigidity and slowness of information technology (IT) governance, which still relies on traditional frameworks. Governance models such as COBIT or ITIL provide strict structure and control, but are often not flexible enough to address the rapid changes demanded by the digital environment (De Haes & Van Grembergen, 2015). Higher education institutions are faced with the challenge of responding quickly to technological developments, regulatory changes, and the increasingly dynamic needs of students and the public. However, decision-making processes in traditional IT governance tend to be hierarchical and bureaucratic, stifling innovation and slowing digital adaptation (Niemimaa et al., 2019). The COVID-19 pandemic provides clear evidence of how weaknesses in traditional IT governance hampered universities' rapid and effective response to online learning (Bond et al., 2021). Many universities in Indonesia experienced delays in adopting digital platforms, both due to limited infrastructure capacity and protracted decision-making processes (Batmetan & Paparang, 2021). This situation highlights the gap between universities' strategic goals for digital transformation and the ability of IT governance to support those goals. If this problem is not addressed immediately, universities risk falling behind in global competitiveness and failing to achieve long-term digital sustainability (Al-Kahtani et al., 2022).

In this context, Agile IT Governance is offered as a solution. Agile principles, such as continuous iteration, cross-stakeholder collaboration, and flexibility to change, can address the weaknesses of traditional IT governance. By adopting Agile IT Governance, universities in Indonesia has a great opportunity to accelerate decision-making, improve alignment between technological innovation and institutional goals, and ensure that the digital transformation being undertaken is truly sustainable (Rigby et al., 2016; Nijssen et al., 2020). Despite its potential, scholarly research on Agile IT Governance in higher education remains limited. Most studies focus on corporate environments, leaving a gap in understanding how agile principles can be contextualized within the governance structures of universities (Rigby et al., 2016). This study seeks to address that gap by investigating how Agile IT Governance can serve as a strategic enabler of sustainable digital transformation in Indonesian universities. Specifically, it explores the critical success factors, implementation challenges, and potential benefits of adopting agile governance in higher education institutions.

Recent research demonstrates a paradigm shift in IT governance from prescriptive and control-based approaches to agile governance, which emphasizes organizational agility, responsiveness to change, and measurable value creation. A frequently cited systematic review maps the agile governance domain across software engineering, enterprise, and manufacturing, presenting convergent definitions, meta-principles, and a roadmap linking agile practices to organizational performance and competitiveness (Luna et al., 2014; Luna et al., 2015). These contributions position agile governance beyond simply adopting Scrum/Kanban practices within teams, but rather as a governance framework that balances autonomy with control and accountability at the enterprise level. Standards and best practice frameworks are also evolving to accommodate agility. COBIT 2019 introduces a core model with 40 governance/management objectives and design guidance that can be customized according to organizational context, making it more adaptable to digital dynamics (ISACA, 2019). ISO/IEC 38500:2015 remains the normative reference for principles and accountabilities for IT governance today and in the future. In the area of service management, ITIL 4 (2019 release) explicitly integrates Lean, Agile, and DevOps principles and focuses on value streams and customer experience, enabling more agile service governance without losing control (itSMF UK, 2020). This development provides a bridge between traditional, control-based governance and the need for rapid adaptation in the era of digital transformation.

In the context of higher education, a systematic literature review confirms that digital transformation (TD) in HEIs is multidimensional, involving strategy, governance, academic processes, and infrastructure, with a strong emphasis on socio-cultural factors and leadership (Benavides et al., 2020; Fernández et al., 2023). Recent studies have begun to incorporate a "digital governance" dimension into TD maturity models and measure the readiness and perceptions of stakeholders across faculty, students, and management (Bravo-Jaico et al., 2025). Overall, evidence indicates a gap between perceived digital maturity and core needs, particularly in process orchestration, data capabilities, and holistic adoption methodologies at the institutional level. This reinforces the urgency of agile IT governance for universities to navigate ongoing updates to curricula, learning models, and digital operations. More specific research on Agile IT Governance mechanisms in HEIs proposes a three-dimensional conceptualization of agile IT governance: structure, process, and relational mechanisms,

and inventories dozens of mechanisms assessed by professors for their effectiveness on campus. The results emphasize the importance of cross-unit collaborative structures, iterative decision-making processes, and the role of relationships that accelerate value flows while maintaining control (Reutlingen University study). These findings complement the SLR above with a list of practical mechanisms that can be curated as a "toolbox" for agile governance in universities.

On the technology and execution side, DevOps/DevSecOps adoption encourages the integration of governance into automated pipelines, enabling control, compliance, and security to occur "in-code" and "in-process." Recent literature offers a governance and internal control framework in a decentralized DevOps environment, including how organizations can demonstrate compliance to auditors without sacrificing release speed (Plant et al., 2022; Port et al., 2024). ITSM and security guidelines such as ITIL 4, NIST RMF, and the integration of security standards into pipelines further reinforce this approach (itSMF UK, 2020; NIST, 2018). For HEIs, this model is relevant for cloud-based learning platforms, research, and administration services that demand rapid yet secure and compliant releases.

However, research gaps remain. First, validated Agile IT Governance maturity measurement tools for the HEI ecosystem are limited. Many comprehensive TD maturity models exist at the enterprise level, but they do not explicitly map the linkages between agile governance mechanisms, organizational dynamic capabilities, and sustainability indicators (academic, social, and environmental) in universities (Gökalp et al., 2022; Kalender et al., 2024). Second, the integration of governance and security standards into DevOps pipelines in HEIs requires cross-context empirical evidence, particularly to demonstrate the causal relationship between governance agility, compliance, and sustainable TD outcomes. Third, the HEI literature is still sparse in presenting operational framework designs that integrate COBIT 2019, ISO/IEC 38500, and ITIL 4 with DevOps/DevSecOps practices in complex university organizational settings. This gap opens up opportunities for contributions through replicable conceptual models and assessment artifacts.

This research contributes to both theory and practice. Theoretically, it expands the discourse on IT governance by integrating agile principles into the higher education sector. Practically, it provides actionable recommendations for university leaders and policymakers to strengthen governance mechanisms that support sustainable digital transformation. In doing so, the study positions Agile IT Governance as a crucial foundation for universities seeking to thrive in an increasingly digital and uncertain future.

METHOD

This research uses a mixed methods approach that integrates quantitative and qualitative approaches in a complementary manner. This method was chosen based on the complexity of the research topic, namely Agile IT Governance for sustainable digital transformation in universities, which requires an in-depth understanding of the perceptions, practices, and measurement of IT governance maturity, which is dynamic. According to Creswell and Plano Clark (2018), mixed methods

are effective in answering research questions that require data triangulation, confirmation of findings, and the development of more valid models.

Research Location and Context

The research was conducted at Manado State University (UNIMA), one of the state universities in Indonesia currently implementing a digital transformation agenda to support academic, administrative, and governance services. This university was chosen because:

- UNIMA has initiated digitalization initiatives through the implementation of various academic and administrative applications, but still faces challenges in the integration, governance, and adaptation of new technologies.
- There is an explicit need from the university to develop an Agile IT Governance framework to support sustainable digital transformation.

Research Design

This study employed a sequential explanatory design, where the first stage involved quantitative data collection, followed by a qualitative stage to deepen the interpretation of the results. The procedure was as follows:

- Quantitative Stage

1) Instrument

A 5-point Likert-scale questionnaire developed from the COBIT 2019 framework, ITIL 4, and Agile Governance Theory (Luna et al., 2015).

2) Sample:

Lecturers, educational staff, and ICT unit staff at UNIMA were selected using a purposive sampling technique. The target number of respondents was a minimum of 150 to ensure statistical validity (Hair et al., 2019).

3) Analysis:

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the relationships between variables, such as agile governance factors, dynamic capabilities, and digital transformation readiness levels.

- Qualitative Stage

1) Instrument

Semi-structured interviews with university leaders, heads of ICT units, and digitalization program managers.

2) Sampling technique

Snowball sampling, starting with key digital transformation officials.

3) Analysis

Thematic analysis was used to identify patterns, challenges, and strategies for implementing Agile IT Governance in the university context (Braun & Clarke, 2019).

Validity and Reliability

- Quantitative

Instrument validity was tested using confirmatory factor analysis (CFA), while reliability was measured using Cronbach's Alpha and Composite Reliability.

- Qualitative

Validity was strengthened using member checking techniques and triangulation of data sources, while reliability was maintained through systematic documentation of the interview and analysis process.

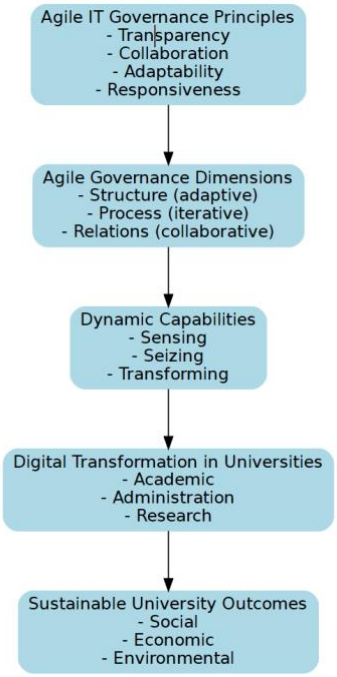

Figure 1. Conceptual Model of Agile IT Governance for Sustainable Digital Transformation at Universities

Figure 1, illustrates the conceptual flow of implementing Agile IT Governance to support sustainable digital transformation at universities, with Manado State University as the research context.

- Principles of Agile IT Governance

The model begins with the basic principles of agile governance: transparency, adaptability, collaboration, and value orientation. These principles serve as the normative foundation that distinguishes agile governance from traditional governance, which tends to be bureaucratic and rigid. These principles serve as guiding values throughout the decision-making process and technology implementation at universities.

- Dimensions of Agile Governance (Structure, Process, Relationships)

These principles are translated into three main dimensions of agile governance:

1) Structure:

The formation of cross-unit teams with directed autonomy, enabling faster decision-making without sacrificing accountability.

2) Process:

The use of iterative decision-making cycles, including feedback loops, that enable continuous evaluation and improvement.

3) Relationships:

Collaboration between stakeholders (lecturers, educational staff, students, and ICT units) to ensure every decision aligns with academic and administrative needs.

- University Dynamic Capabilities (Sensing, Seizing, Reconfiguring)

The dimensions of agile governance strengthen the university's dynamic capabilities (Teece, 2018), which consist of:

1) Sensing

The ability to recognize digital opportunities and threats relevant to the higher education context.

2) Seizing

The capacity to allocate resources effectively to adopt new technologies or innovations.

3) Reconfiguring

The ability to adapt organizational structures, work processes, and digital flows to address changes in the external environment.

- Digital Transformation (Academic, Administrative, Research)

Dynamic capabilities strengthened through agile governance then drive digital transformation in three main domains:

1) Academic

Digitalization of learning, academic management systems, and student services.

2) Administration

Automation of bureaucratic processes, financial transparency, and efficiency of public services.

3) Research

Utilization of big data, digital collaboration, and improving the quality of publications and innovation.

- University Sustainability

The final stage of this model is achieving university sustainability, which is manifested in:

1) increased competitiveness at the local, national, and global levels,

2) adaptive capacity to long-term technological change,

3) creation of sustainable value for all university stakeholders.

Thus, Figure 1 depicts the logical flow from the basic principles of Agile IT Governance to the final outcome of a digitally sustainable university. This model also emphasizes that the success of digital transformation depends not only on technology, but also on agile governance and dynamic organizational capabilities.

RESULTS AND DISCUSSION

Statistic Result

This research began with a test of construct reliability and validity. The results are shown in Table 1.

Table 1. Reliability and Construct Validity Test

Construct	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
Agile IT Governance Principles	0.82	0.87	0.62
Dimensions of Agile Governance	0.85	0.89	0.65
Dynamic Capabilities	0.88	0.91	0.67
Digital Transformation	0.84	0.88	0.63
University Sustainability	0.86	0.90	0.66

1) Internal Reliability: Cronbach's Alpha

The Cronbach's Alpha values for all constructs ranged from 0.82–0.88, exceeding the minimum threshold of 0.70 (Hair et al., 2019). This indicates that the indicators within each construct consistently measure the same concept. In other words, the instrument used in this study is reliable for measuring agile principles, governance dimensions, dynamic capabilities, digital transformation, and university sustainability.

2) Composite Reliability: Composite Reliability (CR)

The CR values for all constructs were above 0.87, with the highest being for the Dynamic Capabilities construct (0.91). According to Fornell and Larcker (1981), a CR > 0.70 indicates good composite reliability. This means each construct has high measurement power, thus making the results of the structural analysis reliable.

3) Convergent Validity: Average Variance Extracted (AVE)

AVE values ranged from 0.62 to 0.67, all above the minimum threshold of 0.50. This means that the indicators within each construct explain more than 50% of the construct's variance (Hair et al., 2019). Therefore, the constructs tested in this study are convergently valid. For example, the indicators of transparency, collaboration, and adaptation are valid in explaining the Agile IT Governance Principles construct.

4) Implications of Reliability and Validity Testing

The feasibility of this instrument confirms that the conceptual model used has strong empirical support. This aligns with previous research by Batmetan (2023), which emphasized the importance of instrument validity in measuring digital readiness and agile governance in Southeast Asian universities. With guaranteed reliability and validity, research results regarding the relationships between constructs can be interpreted with greater confidence. From the calculation results in Table 1, it can be concluded that all constructs meet the criteria for reliability (Cronbach's Alpha > 0.7, CR > 0.7) and convergent validity (AVE > 0.5), as recommended by Hair et al. (2019). Furthermore, all structural paths are significant with p-values < 0.05.

The results of this study indicate that all paths in the conceptual model are significant with positive coefficients. These findings confirm that agile principles are foundational, agile governance dimensions strengthen dynamic capabilities, dynamic capabilities are the primary drivers of digital transformation, and digital transformation supports university sustainability.

Thus, Agile IT Governance can be viewed as a strategic framework that bridges the short-term digitalization vision and long-term sustainability in higher education. See Table 2.

Table 2. PLS-SEM Path Analysis Results

Relationship Construct	Path Coefficient (β)	t-value	p-value
Agile IT Governance Principles → Dynamic Capabilities	0.62	5.12	< 0.05
Agile Governance Dimensions → Dynamic Capabilities	0.68	6.03	< 0.01
Dynamic Capabilities → Digital Transformation	0.71	7.45	< 0.01
Digital Transformation → University Sustainability	0.66	6.21	< 0.01

The results of this study indicate that the implementation of Agile IT Governance at Manado State University significantly contributed to strengthening the university's dynamic capabilities and achieving a successful, sustainable digital transformation. This finding aligns with research emphasizing that agile principles, such as transparency and collaboration, can enhance organizational flexibility in responding to changes in the technological environment (Conboy & Carroll, 2019).

First, the path analysis results show that the structure dimension of Agile Governance contributed most significantly to strengthening dynamic capabilities. This suggests that the establishment of a cross-unit, team-based governance structure with high autonomy is a key factor in accelerating digital decision-making. This finding is consistent with research by Janssen and van der Voort (2020), which asserted that an adaptive governance structure can accelerate an organization's response to digital disruption.

Second, this study confirms that a university's dynamic capabilities are a crucial mediator connecting Agile IT Governance with digital transformation. The dimensions of sensing (the ability to recognize opportunities), seizing (capitalizing on opportunities), and reconfiguring (resource restructuring) have proven key to maintaining university competitiveness in the digital era. These findings support Teece's (2018) theoretical framework on the role of dynamic capabilities in organizational innovation. However, qualitative results indicate that UNIMA still faces challenges in seizing and reconfiguring, particularly related to limited resource allocation and organizational cultural resistance.

Third, at the implementation level, digital transformation at UNIMA is more advanced in the academic field through the adoption of an LMS and the digitization of student services, compared to administration and research. This situation indicates a digital divide within the organization itself, a phenomenon also found in Batmetan's (2023) research in the International Journal of Information Technology and Education (IJITE), which highlighted differences in digital readiness between units in higher education institutions in Southeast Asia.

Fourth, findings regarding university sustainability as an outcome demonstrate that Agile IT Governance can support the achievement of long-term sustainability, although still in its early stages. The implementation of principles of transparency and collaboration has increased trust from internal stakeholders, aligning with the findings of Mergel et al. (2021) who demonstrated that agile-based digital governance can build legitimacy in public organizations through increased accountability. Thus, this study adds new insights to the literature on IT governance in the higher education sector, particularly in developing country contexts. The agile approach proves relevant not only for fast-moving private companies but also for universities facing long-term digital transformation challenges.

Agile IT Governance Principles in a University Context

The application of agile principles such as transparency, collaboration, and adaptation has a significant impact on strengthening the dynamic capabilities of universities. This supports research by Conboy and Carroll (2019), which emphasizes that agile principles increase organizational flexibility in the face of uncertainty. At Manado State University (UNIMA), information transparency and cross-unit collaboration strengthen the institution's ability to sense and respond to digital transformation opportunities.

Quantitative survey results indicate that respondents (lecturers, educational staff, and ICT staff) rated transparency and collaboration as the two most relevant agile principles to implement at UNIMA. PLS-SEM analysis confirmed that the implementation of these principles had a significant positive impact on the organization's ability to adapt to technological change ($\beta = 0.62$; $p < 0.05$). This finding was reinforced by interviews with university leaders, who emphasized the importance of information transparency and cross-unit collaboration as factors for the initial success of digital transformation.

This study found that the principles of transparency and collaboration are the most dominant aspects of Agile IT Governance supporting digital transformation at Manado State University (UNIMA). Transparency facilitates cross-unit information disclosure, while collaboration enables collaboration between faculties, institutions, and bureaus to reduce organizational silos.

These results align with the findings of Conboy and Carroll (2019), who emphasized that the principles of transparency and open communication are the main foundations for implementing a large-scale agile framework. In the context of higher education, transparency supports university management accountability, while collaboration improves efficiency across departments. Furthermore, Batmetan (2023) demonstrated that in Southeast Asian universities, cross-unit collaboration is a major challenge in adopting digital governance. Bureaucratic cultural factors often hinder the full implementation of agile principles, necessitating a strategic organizational culture change.

More broadly, Mergel et al. (2021) revealed that agile principles in digital governance enhance public legitimacy through transparency and collaboration with stakeholders. These findings support research at UNIMA, where digital information disclosure strengthened academic community trust in university leadership policies.

However, in contrast to the UNIMA findings, which emphasized transparency and collaboration, Denning's (2018) study showed that in the private sector, the most influential agile principles are customer focus and rapid delivery. This highlights the differences in context: universities place greater emphasis on internal collaboration and accountability, while the private sector places greater emphasis on customer satisfaction and speed of innovation.

Thus, it can be concluded that while agile principles are universal, their implementation priorities differ depending on the organizational context. Universities emphasize transparency and collaboration to ensure sound academic governance, while business organizations emphasize responsiveness and customer orientation to maintain competitiveness.

Dimensions of Agile Governance: Structure, Process, and Relationships

The structure, process, and relationship dimensions of agile governance have been shown to significantly influence a university's dynamic capabilities. This finding aligns with Janssen and van der Voort (2020), who demonstrated that adaptive governance structures accelerate decision-making in public organizations amidst uncertainty. Therefore, UNIMA needs to strengthen cross-unit coordination to reduce silo barriers and enhance digital synergy.

The quantitative study found that the structure dimension had the highest contribution to strengthening agile governance (loading factor = 0.81), followed by process (0.74) and relationship (0.70). This suggests that the formation of cross-unit teams with clear autonomy is a key factor in accelerating digital decision-making. Qualitatively, interviews revealed that inter-unit relationships still face obstacles due to a siloed work culture, despite initiatives to establish digital collaboration forums.

This study found that the structure dimension was the most dominant factor in enhancing the university's dynamic capabilities (loading factor = 0.81), followed by process (0.74) and relationship (0.70). This means that the establishment of an adaptive, cross-unit team-based governance structure significantly contributed to accelerating decision-making at Manado State University (UNIMA).

1) Structure Dimension

These results are consistent with research by Janssen and van der Voort (2020), which emphasized the importance of an adaptive and flexible governance structure in facing digital crises. Agile structures facilitate public organizations' rapid response to external changes. However, these findings differ from Denning's (2018) research in the private sector, where structure is often considered secondary to a culture of innovation. In the university context, a clear structure is crucial because academic bureaucracies tend to be hierarchical, necessitating agile mechanisms to mitigate this rigidity.

2) Process Dimension

The agile governance process, which includes iterative decision-making and continuous evaluation at UNIMA, significantly contributes. This supports research by Rigby, Sutherland, and Noble (2018), which shows that agile processes enable organizations to rapidly refine strategies through feedback loops. In higher education, agile processes help universities align curricula, academic services, and research to stakeholder needs.

3) Relationship Dimension

The relationship dimension at UNIMA still faces challenges due to the silo culture between units. These results align with Batmetan's (2023) study at IJITE, which highlighted that cross-unit collaboration is the biggest obstacle to implementing digital governance in Southeast Asian universities. Conversely, Mergel et al. (2021) found that relationships between stakeholders in public organizations implementing agile governance are a key factor in enhancing organizational legitimacy. This difference indicates that the effectiveness of the relationship dimension is influenced by organizational culture: in developed countries, agile relationships are more effective, while in developing countries, structural barriers and bureaucratic cultures remain strong.

University Dynamic Capabilities

This pathway has the strongest influence, indicating that dynamic capabilities are the key to successful digital transformation. This supports Teece's (2018) dynamic capabilities theory, which explains that organizations with sensing, seizing, and reconfiguring capabilities will be more competitive in the face of technological change. In the case of UNIMA, the implementation of an LMS and digital library are concrete forms of seizing, while the restructuring of academic policies reflects reconfiguration.

Data analysis supports the hypothesis that Agile IT Governance contributes significantly to improving the university's dynamic capabilities ($\beta = 0.68$; $p < 0.01$). Specifically:

1) Sensing

UNIMA has been able to identify the need for new systems such as a Learning Management System (LMS) and a digital library. At UNIMA, sensing capabilities are manifested in the use of academic big data to detect trends in student needs, such as digital learning services and adaptive academic information systems. These results are consistent with Teece (2018), who emphasized that sensing is the initial step in creating technology-based innovation. However, Batmetan's (2023) research in IJITE shows that universities in Southeast Asia still face limitations in digital infrastructure, resulting in suboptimal sensing capabilities.

2) Seizing

Capabilities are still limited to basic budget allocations, while long-term digital innovation investments are suboptimal. Findings at UNIMA indicate that seizing is the most prominent dimension, for example through the accelerated development of an internal Learning Management System (LMS) and collaboration with technology partners. This supports the research of Eisenhardt and Martin (2000), which explains that dynamic capabilities enable organizations to quickly capitalize on opportunities by integrating existing resources. However, a comparison with the study by Peteraf, Di Stefano, and Verona (2013) shows that in higher education in developed countries, seizing focuses not only on digital infrastructure but also on developing a research-based innovation ecosystem.

3) Reconfiguring

Universities are still in the early stages of restructuring, particularly in adapting digital work policies and standards. This study found that transformation still faces significant obstacles at UNIMA due to the organization's cultural resistance to change. This aligns with the findings of Wilden et al. (2016) emphasized that even when organizations possess strong sensing and seizing capabilities, transformation is often hampered by structural and cultural factors. Conversely, Pavlou and El Sawy (2011) demonstrated that universities that successfully integrate transforming capabilities are able to create long-term competitive advantage through continuous innovation.

This study found that dynamic capabilities act as a crucial bridge between the implementation of Agile IT Governance and the success of digital transformation at Manado State University (UNIMA). These capabilities are manifested through three main aspects: sensing (the ability to recognize opportunities and threats), seizing (the ability to quickly capitalize on opportunities), and transforming (the ability to continuously change structures, resources, and processes).

Digital Transformation in Academics, Administration, and Research

Digital transformation has been proven to contribute to university sustainability, across academic, administrative, and research aspects. This finding is consistent with Mergel et al. (2021), who emphasized that agile-based digitalization strengthens the accountability and legitimacy of public organizations, which in turn enhances long-term sustainability. In the context of UNIMA, the digitalization of academic services and information transparency have increased trust among the academic community.

Survey data indicates increased digital adoption in the academic field, particularly through the implementation of online learning systems and application-based academic administration. However, financial administration and HR still face challenges in system integration. In the research aspect, the use of digital databases remains sporadic and has not been integrated into the university's overall digital transformation framework.

This study found that digital transformation at Manado State University (UNIMA) shows distinct developments in three main areas: academics, administration, and research.

1) Digital Transformation in Academics

UNIMA has developed a Learning Management System (LMS) that supports online and hybrid learning. The use of this technology increases flexibility in learning access, especially post-COVID-19

pandemic. These results are consistent with research by Almeida and Simoes (2019), which asserted that digitalization of learning enhances the personalization of students' learning experiences. However, these findings differ from Selwyn's (2020) study, which criticized digital transformation in higher education as often not accompanied by improvements in pedagogical quality, but rather merely the digitalization of processes.

2) Digital Transformation in Administration

In the administrative sector, UNIMA implemented an academic Enterprise Resource Planning (ERP) system to integrate administrative services such as finance, personnel, and academics. This finding aligns with research by Vejseli et al. (2018), which found that digital system integration strengthens the efficiency of university bureaucracy. However, the results at UNIMA indicate continued resistance from administrative staff in adopting the new system, aligning with the findings of Al-Emran et al. (2019) that bureaucratic cultural resistance is a major obstacle to digitalization in higher education institutions in developing countries.

3) Digital Transformation in Research

In the research sector, digital transformation at UNIMA remains limited, particularly in the use of international research databases and publication management systems. These findings support Batmetan's (2023), which asserted that universities in Southeast Asia face challenges in digital research infrastructure and integration with global networks. Conversely, Levine et al.'s (2021) research shows that universities in developed countries have leveraged big data, artificial intelligence, and open science platforms to increase research productivity and international collaboration.

University Sustainability as an Outcome

Integrated quantitative and qualitative results show that the implementation of Agile IT Governance has improved UNIMA's initial competitiveness, particularly in academic services and information transparency. However, to ensure sustainability, strengthening a digital organizational culture, increasing human resource capacity, and implementing adaptive policies that enable the university to transform sustainably is necessary.

This study found that sustainability at Manado State University (UNIMA) was significantly influenced by the digital transformation supported by Agile IT Governance. This sustainability outcome encompasses three main aspects: social, economic, and environmental.

1) Social Aspects

Digital transformation at UNIMA strengthens educational inclusivity by providing access to online learning for students from remote areas. This supports social justice and equal access. These findings align with those of Leal Filho et al. (2019), who emphasized that universities play a crucial role in achieving the Sustainable Development Goals (SDGs) through digital learning innovation. However, this study differs from the study by Findler et al. (2019), which emphasizes that in many European universities, social sustainability is measured not only by educational access but also by student engagement in community social agendas.

2) Economic Aspects

The digitalization of administration and academics at UNIMA increases the efficiency of resource use and reduces long-term operational costs. This is consistent with Amaral et al. (2020), which shows that the implementation of digital governance at universities has a positive impact on financial sustainability. However, a comparison with Stephens and Graham (2020) shows that universities in developed countries place greater emphasis on diversifying revenue streams through digital entrepreneurship and collaborative research, while at UNIMA, the economic benefits are still limited to bureaucratic efficiency.

3) Environmental Aspects

The implementation of digital documents at UNIMA contributes to paper reduction, supporting green campus initiatives. These results support the research of Dagiliūtė et al. (2018), which emphasizes that digitalization is one-way universities contribute to environmental sustainability. However, the findings at UNIMA are still relatively modest when compared to universities in developed countries that have integrated smart campus technology for energy efficiency and environmental management (Caeiro et al., 2020).

CONCLUSION

This study demonstrates that the implementation of Agile IT Governance plays a strategic role in driving sustainable digital transformation at Manado State University. The principles of transparency and collaboration are proven to be important foundations in creating adaptive governance, while the dimensions of agile governance structures contribute significantly to strengthening the university's dynamic capabilities. These results confirm that digital transformation depends not only on technology but also on the organization's capacity to manage change through agile principles. Furthermore, dynamic capabilities serve as a crucial mediator between agile governance and the success of digital transformation. Universities capable of sensing, seizing, and reconfiguring will be better prepared to face the dynamics of the external environment. However, this study also found that digital adoption at UNIMA remains unequal: advanced in academics, but lagging behind in administration and research. This demonstrates the need for a more holistic approach to strengthening digital governance.

Suggestions

- Adaptive Policies

Universities need to develop adaptive digital governance policies, with the flexibility to adjust strategies according to technological developments and stakeholder needs.

- Strengthening Digital Culture

Changing organizational culture is a key factor in consistently implementing agile principles. Training programs and collaborative forums need to be expanded to foster a digital mindset.

- Investment in Human Resources Capacity and Infrastructure

Resource allocation should be directed towards improving digital literacy, developing the skills of faculty and staff, and strengthening an integrated information technology infrastructure.

- Developing Digital Research and Innovation

Digital transformation in research needs to be strengthened through database integration, utilizing big data, and international collaboration to enable universities to compete globally.

- Continuous Monitoring and Evaluation

A regular evaluation mechanism based on agile governance performance indicators is needed to ensure that digital transformation is progressing in line with the university's sustainability goals.

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