Agile IT Governance for Digital Transformation at Manado State University: Implementation Strategy on Application Factors

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ABSTRACT

Digital transformation in the higher education environment demands adaptive and responsive information technology governance (IT Governance). Agile IT Governance is a relevant approach to improving university information technology systems' flexibility, effectiveness, and sustainability. This study explores the implementation strategy of Agile IT Governance on application factors at Manado State University. Using a qualitative approach with the SWOT analysis method and priority analysis using McFarlanGrid, this study identifies key factors that influence the adoption of Agile IT Governance, including organizational, technological, and policy aspects. The results of the study indicate that the success of implementing Agile IT Governance in universities depends on collaboration between stakeholders, digital infrastructure readiness, and an iterative approach to developing and managing applications. The implications of this study provide insight for higher education institutions in designing a more adaptive and sustainable digital transformation strategy at Manado State University.

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INTRODUCTION

Digital transformation has become a strategic agenda in various sectors, including higher education, to improve operational efficiency, service quality, and institutional competitiveness. Digital transformation in higher education has become an urgent need to improve operational efficiency, learning effectiveness, and institutional competitiveness(De Haes & Van Grembergen, 2015). In many higher education institutions, traditional approaches to IT governance tend to be less responsive to changing organizational needs, resulting in suboptimal application development and maintenance(Weill, P., Ross, 2004). Agile IT Governance is a concept that combines IT governance principles with flexibility and iteration in technology management(De Haes, Van Grembergen, Anant, & Huygh, 2020). This approach allows universities to adopt a more dynamic system in application development and management, thereby accelerating the digital transformation process(Amorim, Mira da Silva, Pereira, & Gonçalves, 2021). One crucial aspect of digital transformation is the application factor, which includes academic management systems, online learning, digital administration services, and information system integration. However, the implementation of this technology is often hampered by the limitations of rigid governance, lack of coordination between stakeholders, and slow adoption of technology due to inflexible bureaucratic procedures (Vejseli & Rossmann, 2018)

Manado State University (Unima) as one of the higher education institutions in Indonesia faces challenges in implementing information technology (IT) optimally to support academic and administrative processes. Unima as a higher education institution faces challenges in adopting information technology (IT) effectively to support academic, administrative, and research processes. However, the implementation of IT in the context of education often faces obstacles such as rigid bureaucracy, lack of flexibility in application management, and limited human resources and technology infrastructure(Santos, Batista, & Marques, 2019). Therefore, a more adaptive IT governance approach is needed, such as Agile IT Governance, to ensure the implementation of technology that is responsive to changes and organizational needs. In the context of Unima, the application factor is a crucial element in supporting digital transformation, including academic management systems, online learning, digital-based administration services, and integration of other technology platforms. The success of the implementation of Agile IT Governance in the application factor at Unima depends on the readiness of the organization, collaboration between stakeholders, and the adoption of agile methods in managing IT systems.

Therefore, a more adaptive, collaborative, and iteration-based Agile IT Governance approach is needed to ensure the sustainability and effectiveness of digital transformation at UNIMA. However, there has not been much research that specifically explores how Agile IT Governance implementation strategies can be applied effectively in the context of higher education, especially in application factors. Several previous studies have discussed various approaches to information technology governance, including COBIT, ITIL, and ISO 38500, which emphasize aspects of compliance, policy structure, and risk management in IT management (De Haes & Van Grembergen, 2021). However, this traditional

approach is often considered less flexible in accommodating rapid changes in the higher education environment, especially in the management and development of digital applications (ISACA, 2019). In contrast, the concept of Agile IT Governance has evolved as a more adaptive and iterative solution in IT governance, enabling organizations to respond to business needs more quickly and effectively (Horlach et al., 2019). Although this concept has been applied in various industrial sectors, studies on its implementation in the context of higher education are still limited (Gregor et al., 2020). Specifically, research discussing the application of Agile IT Governance in the digital transformation of universities in Indonesia, especially Unima, is still minimal. There are research gaps identified in this study including, gaps in adaptive IT governance models for universities and Lack of research on application factors in Agile IT Governance. Most research on IT Governance in higher education still focuses on traditional models (COBIT, ITIL, ISO 38500), while research on the application of Agile IT Governance in an academic context is still very limited (De Haes et al., 2020). There is no specific model that integrates agile principles into application governance in the higher education system in Indonesia, especially at Unima. Most studies on Agile IT Governance in the education sector focus more on general digital transformation strategies, without a specific focus on application factors such as academic management systems, e-learning, and digital administration services (Janssen & van der Voort, 2020). There has been no research exploring how agile methods in application management can improve the effectiveness of digital transformation in universities. There are few case studies in Indonesian universities, especially at Unima. Most studies on Agile IT Governance are conducted in the context of companies and industrial sectors, while its application in higher education, especially in Indonesia, has not been widely studied (Horlach et al., 2019).

There has been no empirical study evaluating how Unima can adopt Agile IT Governance to accelerate digital transformation through application management. Lack of implementation strategies based on specific university needs. Existing research focuses more on the benefits of Agile IT Governance, but not many detail its implementation strategies in the context of higher education (Bernard, 2021). A more contextual approach is needed in developing an Agile IT Governance implementation strategy at Unima that takes into account the challenges and characteristics of the institution. To fill this research gap, this research attempts to explore the application of Agile IT Governance in the context of Unima, especially in the application factor. This research attempts to develop a contextual implementation strategy that considers specific challenges in application governance at Unima. Thus, this research has academic and practical significance in supporting the development of IT governance that is more responsive to the dynamics of technological change and the needs of higher education. Based on these problems, this research focuses on the main aspect, namely, What strategies can be applied to ensure the success of Agile IT Governance in application management to support digital transformation at Unima? Answering this question, this study provides an important contribution to developing a more adaptive and innovative IT governance model, as well as providing insight for higher education institutions in improving the effectiveness of their digital transformation(Antonopoulou, Begkos, & Zhu, 2023). This study aims to identify the implementation strategy of Agile IT Governance on application factors at Manado State University to support digital

transformation. This study uses a qualitative approach with a case study method to explore the challenges, opportunities, strengths, weaknesses, and success factors in implementing more flexible IT governance. The results of this study are expected to provide insight for higher education institutions in designing a more adaptive, innovative, and sustainable IT governance strategy. This study also aims to fill the research gap by developing an Agile IT Governance implementation strategy that focuses on application factors to support digital transformation at Manado State University. This study contributes to identifying challenges and opportunities to utilize strengths by reducing weaknesses in the implementation of agile IT Governance in application management in higher education. This study also provides strategic recommendations for Unima in adopting Agile IT Governance to improve the effectiveness of digital transformation.

METHOD

The method used in this study is qualitative research. Strategic analysis is carried out by conducting an in-depth analysis of Digital Transformation at the university with the Agile IT Governance approach(Creswell, 2015). The analysis is carried out by conducting a qualitative analysis using the SWOT analysis method (Strength, Weakness, Opportunity, Threat)(David & David, 2017). This method was chosen because it is very good for analyzing by considering internal and external aspects so that it can produce a good and relevant strategy according to the context of Digital Transformation at the University(Utsalina & Primandari, 2020). The strategy results obtained will be arranged based on priority analysis using both SWOT and the McFarlan Grid method(Ward & Peppard, 2002).

The resulting strategy analysis is arranged according to the factors analyzed and its implementation is built according to these factors. Through this priority analysis, each initiation will be given the following label:

- **STRATEGIC (S).** The Strategic label means that this initiation is Very Important to do because it is related to services that are currently very much needed to be prepared by the university.
- **KEY OPERATIONAL (K).** This Key operational label views the initiation as Important to Do But Not Urgent. Will be very much needed in the future.
- **HIGH POTENTIAL (H).** The High potential label is given to initiatives that are Important but Still Far to Be Implemented/Can Be Delayed.
- **SUPPORT (U).** This Support label is given to initiatives that are NOT Too Important for Services but Quite Helpful If Done.

The following are the results of the sustainable construction implementation strategy produced.

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Time and Place of Research

The research was conducted in February 2024 – November 2024. The research location was at Manado State University.

Population and Sample

A research population is a collection of individuals, groups, or objects that have certain characteristics that are the focus of the research. The population reflects the entire entity that will be studied in the research and is the source from which the sample is taken(Creswell & Plano Clark, 2018)(Amruddin, 2022). The research population is a fundamental element in research methodology that determines the validity and relevance of the research results(Sugiyono, 2013).

The population in this study was 334 people. The population of this study were staff/employees at UPA ICT, operators, and leaders at Manado State University, while the sample used was purposive sampling which was part of the population taken based on certain objectives (Sugiyono, 2013). The sample size was determined using the Slovin formula, as follows:

Slovin Formula

$$n = \frac{N}{1 + N(e)^2}$$

Where:
n = Sample size/number of respondents
N = Population Size
e = percentage of tolerance of sampling error accuracy that can still be tolerated. The e value used is 0.2 (20%) for the population because the number is small.
The number of samples used is as follows:

$$n = \frac{234}{1 + 234(0,1)^2}$$
$$n = \frac{234}{1 + 2,34} = 70,06$$

Adjusted by the researcher to 100 respondents

The sampling technique in this study was carried out by Purposive sampling. Purposive sampling is a sampling technique that is carried out by deliberately selecting individuals or groups that have certain characteristics according to the objectives of the study. This technique is often used in qualitative research because it allows researchers to obtain more in-depth and relevant data on the

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phenomena being studied (Creswell & Plano Clark, 2018). In this study, purposive sampling was used to select participants who had specific experience, skills, or knowledge related to the system, method, or technology being studied.

The type of purposive sampling used in this study is Critical Case Sampling. This is because the sample is very important and has great potential in explaining the research phenomenon. In addition, the sample can meet certain criteria that have been set.

The criteria used for this research sample are
a. Have experience, expertise, and involvement in the development of IT systems at Manado State University
b. Not Random and determined by UPA ICT, operators, and leaders who understand and are involved in the development and operation of IT systems
c. Representative of the Phenomenon, namely the selected sample must be able to provide rich and in-depth information related to the phenomenon being studied.

Based on the description, the number of samples taken based on purposive sampling is 100 respondents.

RESULTS AND DISCUSSION

Implementation Strategy on Application Factors for Digital Transformation

Analysis of the implementation strategy for Application factors for Digital Transformation is carried out by considering in the table 1.

Table 1. SWOT Analysis on Application Factors for Digital Transformation

SWOT	STRENGTH	WEAKNESS
	1. Application Portfolio Management plan is available at UPA ICT 2. There is good cooperation with large developers for Application Maintenance so that applications at the university can be managed properly 3. In application development, local programmers have been	1. Not yet well available Enterprise Application Selection & Implementation at universities 2. Efficiency has not been implemented properly, especially in the development of applications at universities 3. Difficulties in providing senior programmers at an expert level within the university 4. The availability of senior programmers and expert

	used so that there is an increase in economic welfare 4. Educated human resources so that it is easy to implement a new application/system	application developers is limited, so it takes time to develop the application 5. Application Development Throughput has not been implemented properly at the university 6. Application Development Quality is not yet available and implemented, so the application used is not fully guaranteed in quality
OPPORTUNITY 1. Large Application developers can already adapt to the Agile IT Governance method in collaboration with universities 2. Large Application Developers who collaborate with universities are starting to be able to make efficiency in the use of information technology 3. The need for artificial intelligence-based technology that can work more carefully, meticulously and quickly that can support the improvement of the quality of IT services	1. Increasing the number of effective applications to support the realization of digital transformation in universities 2. Improving the quality and security of applications so that they are in accordance with the needs of the system at the university 3. Providing experts and IT system operators who have qualified competencies according to today's needs and challenges	1. Providing training for HR for Application development governance at universities 2. Providing training for human resources to achieve skills/competencies as senior programmers/experts
THREAT 1. The increase in cyber-attacks so that it can disrupt the digital systems (applications) used 2. Regulations and regulations that can hinder the development of IT implementations including AI, etc in society 3. The development of social media that can be a medium for spreading hoaxes, and bad	1. Strengthening IT (cyber security) systems to provide safe, secure and reliable systems 2. Selection of workers according to the competencies and operational needs of the IT system at the university 3. Efficient selection of media to disseminate information transparently, correctly and in accordance with laws and regulations	Increased socialization to users about the safe and efficient use of applications by universities in order to realize digital transformation in universities

public perception and dependence on social media/games in generation Z.		

Priority Strategy on Application Factors to Digital Transformation

After the SWOT analysis was carried out, the researcher continued to do positioning. This is intended to measure the position of the strategy and whether it can be prioritized or not. This is because the influence of application factors on internal and external factors is different, so positioning is needed to determine the priority scale. The way to determine this priority can be done by giving weight to certain aspects. The researcher begins by determining the important factors of the internal conditions in the digital transformation of the university. Then, the researcher grouped them into strengths and weaknesses. The weight column is the level of importance of each factor, the weighting of 0.20 is very important, 0.1 is important, 0.05 is quite important, 0.01 is not important, and if added up, it will be worth 1.00(Freddy Rangkuti, 2006)(Utsalina & Primandari, 2020). Meanwhile, rating is the value of the internal condition of each organization. A score of 4 for excellent conditions, a score of 3 for good conditions, a score of 2 for ordinary conditions, and a value of 1 for poor conditions. Factors 3 and 4 are only for the strength group, while 2 and 1 are for the weaknesses group. Then, the value of each factor is the result of the time between weight and rating. If all values are added together, then the value of the SWOT results of the strategy can be known(Porter, 1985). See Table 2.

Table 2. Calculation in determining the priority of strategy factors for applications to Digital Transformation

STRATEGY FACTORS	WEIGHT	RATING	TOTAL (BOBOT x RATING)
STRENGHTS (S)			
1. Application Portfolio Management plan is available at UPA ICT	0,1	3	0,3
2. There is good cooperation with large developers for Application Maintenance so that applications in universities can be managed properly	0,2	4	0,8
3. In application development, local programmers have been used so that there is an increase in economic welfare	0,1	4	0,4
4. Educated human resources so that it is easy to implement a new application/system	0,1	3	0,3
Sub Total	0,50		1,8

WEAKNESS (W)			
1. Not yet available properly Enterprise Application Selection & Implementation at universities	0,1	2	0,2
2. Efficiency has not been implemented properly, especially in the development of applications at universities	0,1	2	0,2
3. Difficulty in providing senior programmers at an expert level within the university	0,1	4	0,4
4. The availability of senior programmers and application development experts is limited, so it takes time so that application development takes longer/takes time	0,05	2	0,1
5. Application Development Throughput has not been implemented properly at the university	0,05	2	0,1
6. Application Development Quality is not yet available and implemented, so the application used is not fully guaranteed quality	0,1	2	0,2
Sub Total	0,50		1,2
TOTAL (S+W)	1,00		
OPPORTUNITY (O)			
1. Large Application Developers can already adapt to the Agile IT Governance method in collaboration with universities	0,2	4	0,8
2. Large Application Developers who collaborate with universities are starting to be able to make efficiency in the use of information technology	0,2	3	0,6
3. The need for artificial intelligence-based technology that can work more carefully, meticulously and quickly that can support the improvement of the quality of IT services	0,2	4	0,8
Sub Total	0,6		2,2
THREAT (T)			
1. Increasing cyber-attacks so that they can disrupt the digital systems (applications) used	0,2	4	0,8
2. Regulations and regulations that can hinder the development of IT implementation, including AI, etc. in society	0,1	2	0,2
3. The development of social media which can be a medium for spreading hoaxes, and bad public perception and dependence on social media/games in generation Z.	0,1	2	0,2

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Sub Total	0,4	1,2
TOTAL (O+T)	1,00	

From the results of the calculation above, the following analysis results were obtained:

Total Score factor strengths = 1,8

Total Score factor weakness = 1,2

So that the determination of coordinates for internal factors is used the formula:

Coordinate internal IFAS (internal factor strategy) = total score factor strengths - total score factor weakness

IFAS = 1,8 – 1,2 = **0,6**

Thus the actual internal factor coordinates are 0.6.

Next, analysis is carried out to obtain external coordinates, as follows:

total score factor opportunity = 2,2

total score factor threats = 1,2

Coordinate external EFAS (external factor strategy) = total score factor opportunity - total score factor threats

EFAS = 2,2 – 1,2 = **1,0**

Thus the actual external factor coordinates of 1.0 are obtained.

After getting the coordinates of each factor, namely internal and external factors, the next step is to determine the strategy in the form of determining the position of the quadrant in the SWOT analysis diagram. The determination of this SWOT diagram serves to determine the position of the strategy to be implemented. The strategy is found in quadrants I, II, III, or IV. This quadrant serves to determine and identify whether the strategy is aggressive, diverse, turn-around, or defensive. The determination of the quadrant can be seen in Figure 1.
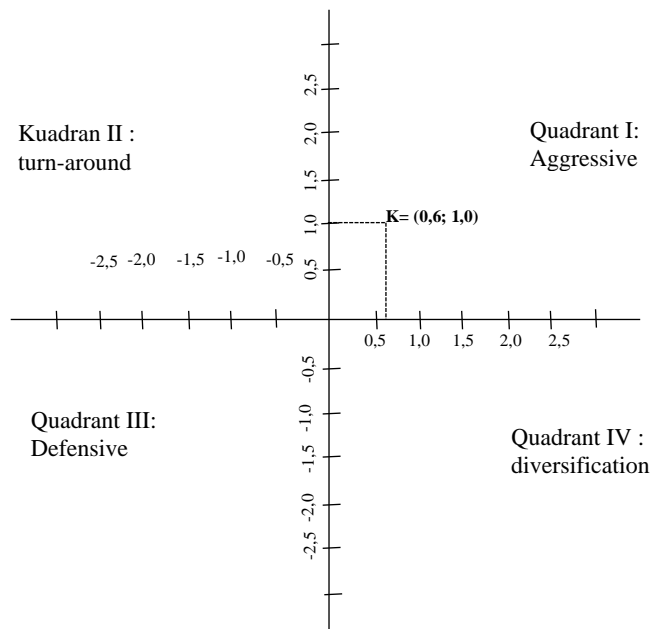
Figure 1. Determination of quadrants in SWOT factor analysis Application to Digital Transformation

The strategy developed is in line with the researcher Ristić, et.al who found that the sustainable development strategy must be carried out with a multi-criteria approach that includes many factors(Ristić, Maksin, Nenković-Riznić, & Basarić, 2018). One of the determining factors is the application factor. Therefore, the strategy developed should be an aggressive strategy that can encourage the level of application development(Nermend, Singh, & Singh, 2022).

Thus, it can be said that the priority of the resulting strategy is in quadrant I, so that the resulting strategy is aggressive. This means that the strategy for implementing digital transformation in universities has internal aspects that can be used to seize and maximize the identified opportunities so that it can increase the effectiveness of application factors and this digital transformation can be accepted and implemented properly at the university(Mei, Feng, & Cavallaro, 2023)(Habib, 2023).

The strategy developed in this study is in line with other researchers who also found that to be able to sequence strategies on real application factors that can be implemented, researchers use the McFarlan Grid method(Ward & Peppard, 2002). With this method, the researcher lowered the d strategy based on strategic values (S), Key performance (K), High potential (H), and Support (U). More details can be seen in Table 3.

Table 3. Priority Strategy Analysis on Application Factors

No	STRATEGY	PRIORITY
1.	Increasing the number of effective applications to support the realization of digital transformation in universities	S
2.	Improving the quality and security of applications so that they are in accordance with the needs of the system at the university	K
3.	Providing experts and IT system operators who have qualified competencies according to today's needs and challenges	S
4.	Providing training for HR for Application development governance at universities	H
5.	Providing training for human resources to achieve skills/competencies as programmers	K
6.	Strengthening IT (cyber security) systems to provide safe, secure and reliable systems	U
7.	Selection of workers according to the competencies and operational needs of the IT system at the university	S
8.	Efficient selection of media to disseminate information transparently, correctly and in accordance with laws and regulations	H
9.	Increased socialization to users about the safe and efficient use of applications by universities in order to realize digital transformation in universities	U

In the formulation of the strategy in Table 3, it is found that in the application factor, 3 strategies are strategic and are the main priority to be carried out immediately and should not be postponed, 2 strategies that are key to the strategy are important to be carried out but not urgent. 2 strategies are high potential that are important to do but can still be postponed to be implemented shortly. The last strategy that can be produced is a support strategy. In the priority analysis carried out, 2 strategies are supportive, meaning that the strategy is not very important but will be very helpful if it is done(Kirkwood & Price, 2014).

Universities need to implement strategic strategies on application factors such as increasing the number of effective applications to support the realization of digital transformation in universities, providing experts and IT system operators who have qualified competencies according to current needs and challenges, and selecting workers according to the competencies and operational needs of IT systems at universities(Jackson, 2019). Strategy – this strategy is very important to be implemented urgently to achieve digital transformation. After that, key performance, high potential, and support strategies can be sorted according to priorities based on available time and funds(Wang, Li, Tian, Zakuan, & Rani, 2023).

CONCLUSION

This study explores the implementation strategy of Agile IT Governance in supporting digital transformation at the State University of Manado (UNIMA), focusing on application factors. In the increasingly growing digital era, universities are faced with challenges in managing information technology (IT) systems that are adaptive, flexible, and able to support dynamic changes. Therefore, the implementation of Agile IT Governance is a strategic solution in ensuring that IT systems, especially digital applications, can be managed more responsively and innovatively. Agile IT Governance offers a more flexible, collaborative, and iterative approach, allowing academic institutions to more quickly adapt to technological developments as well as the needs of students and educators. The successful implementation of Agile IT Governance at Unima depends on collaboration between stakeholders, including university leaders, lecturers, administrative staff, and IT development teams. Digital infrastructure readiness and management commitment are important factors in supporting the implementation of Agile IT Governance. The application of Agile methods in the application development and maintenance cycle allows for faster iteration and adaptation to evolving user needs. This study also concludes that an appropriate Agile IT Governance implementation strategy for Unima is needed to increase the effectiveness of IT application management in the academic environment. Implementation of strategies such as strengthening collaboration-based governance through a cross-functional teams approach, which allows for more effective communication between application developers, lecturers, and students. Increasing the capacity of human resources in adopting the Agile approach, through training and skill development for IT staff and digital system managers at UNIMA. Continuous evaluation and measurement of performance, using Agile metrics such as lead time, cycle time, and customer satisfaction, to ensure the effectiveness of application governance is indispensable to implement. The implementation of Agile IT Governance in application management at UNIMA is a strategic step to support a more effective, adaptive, and user-oriented digital transformation. By adopting a more flexible approach to IT governance, UNIMA can improve the quality of academic and administrative services, and be better prepared to face the challenges of digitizing higher education in the future.

Research Implications

This research provides academic and practical contributions to the field of IT Governance and digital transformation in higher education. Academically, this research enriches the literature on the implementation of Agile IT Governance in universities, especially in the Indonesian context. Practically, this research offers a strategic model that can be adopted by UNIMA and other universities in managing IT systems more flexibly and adaptively.

This study recommends several things for future research such as a broader empirical study, covering other universities in Indonesia to compare the effectiveness of the implementation of Agile IT Governance. In addition, it is also possible to develop a hybrid model, which integrates the Agile approach with traditional frameworks such as COBIT or ITIL to achieve a balance between flexibility and regulatory compliance. Furthermore, an analysis of the impact of the implementation of Agile IT Governance on university performance can also be carried out, both from academic, administrative, and user experience aspects (lecturers and students).

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