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Governance of Digital Transformation Initiatives: A Case Study of Industrial Engineering Program at Universitas Bakrie

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A B S T R A C T

This research aims to explore the governance of digital transformation initiatives in the Industrial Engineering Study Program, Faculty of Economics and Social Sciences, Bakrie University. Using a descriptive qualitative approach, this study identifies and analyzes how the institution manages digital change, the challenges faced, and the impact on various aspects of education. Data was collected through in-depth interviews with leaders, lecturers, administrative staff, and students, as well as observation and study of relevant documents. The findings show that the success of digital transformation depends on strong leadership, integration of technology in the curriculum, data security policies, and an organizational culture that supports innovation. Active stakeholder engagement and effective risk management strategies also play an important role in overcoming digital challenges

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INTRODUCTION

In today's era of increasingly competitive and dynamic market demands. Organizations in various sectors are implementing "Digital Transformation" projects. Essentially, there is a clear shift in the role of technology within an organization. No longer just a support function that facilitates business processes, technology is now capable of much more. Today, technology enables innovative new business models, drives sales growth, and can even be a source of competitive advantage. According to David Tang there are many technology trends driving Digital Transformation. Some of the prominent ones include Social Media, Mobility, *Internet of Things* (*IoT*), Cybersecurity, *Big Data* & Analytics, Cloud Computing, Robotic Process Automation (RPA), Artificial Intelligence (especially Machine Learning), and Blockchain. (Tang, 2021).

In the face of increasingly competitive and dynamic market demands. Digital technology-enabled organizations are supported by new information and communication technologies (ICT), referred to as digital technologies, which increasingly promise enormous growth opportunities. These new digital technologies include ICT systems such as virtualization, mobility, and analytical systems, and are integrated with *back-office* ICT to provide a holistic view of the digital enterprise. This kind of initiative is referred to as digital transformation, which requires organizations and their respective management to reflect significantly on the process of successful implementation. (Loonam et al., 2018). Digital transformation will look different for each Organization or company, it is difficult to find a definition that applies to all. According to Upradista, Digital transformation is the transformation of activities, processes, competencies, and business and organizational models to fully leverage the changes and opportunities from diverse digital technologies and their accelerating impact across industries in a strategic and prioritized manner, with an eye on current and future shifts. (Upadrista, 2021).

According to Priyanka Malik, Governance of Digital Transformation Initiatives considers 6 parameters, Organizations need to assess how ready the team is to undertake such a major effort. There are six factors to consider before starting the digital transformation process, which include digital maturity, technological requirements, stakeholder buy-in , it strategic planning , impact on different departments, and avenues to drive digital adoption. (Malik, 2022b). The proliferation of digital technologies has changed perspectives in many industries, opening up new opportunities, increasing efficiency, and changing the way we relate to our surroundings. Research conducted by Westerman et al, surveying 391-400 large companies with revenues of $500 million or more in 30 countries, found that organizations with successful digital strategies have 26% greater profits than their peers and generate 9% higher revenues from their physical businesses. (Westerman et al., 2012). Then the latest research from Behnam Tabrizi et al , with respondents from Directors, CEOs, and senior executives, this research found that: digital transformation is risky, the number one concern occurred in 2019. 70% of all digital transformation initiatives did not achieve their goals. Of the $1.3 trillion spent on digital transformation last year, an estimated $900 billion was wasted. (Tabrizi et al., 2019).

Successful digital transformation depends more on how companies become digital rather than just using digital technologies ("What Is Digital Transformation?," 2023). Tabrizi et al. agree that the success of digital transformation in organizations or companies is only 30%. But although the success rate of several studies on digital transformation in 2019 is still small, some successful organizations have become one of the masters of digital transformation initiatives in their respective fields. Digital transformation provides unique opportunities for organizations to innovate and grow, digital transformation also presents significant digital transformation challenges, digital maturity and the level of digital transformation by sector varies greatly The following examples of digital transformation case studies inspire when carrying out transformation projects in 2024 (Malik, 2022a).

In higher education, digital transformation is bringing significant and strategic changes to the way education is delivered, managed and enjoyed by students and faculty. Digital transformation in higher education is still evolving. In the future, it is expected that digital transformation can help improve the quality of higher education in Indonesia. However, the complexity and challenges in managing digital transformation initiatives against failure are still considerable. (Loonam et al., 2018) mentioned a failure rate of up to 90% in the implementation of enterprise systems. (Kaplan, 2022) continues that higher education must avoid the mistakes of other sectors and understand that 'going digital' means more than just moving offline courses to digital platforms. Hess et al. argue that, current work in academia is largely concerned with providing guidance on certain aspects of digital transformation (Hess et al., 2020). The mission of higher education institutions is to develop students' employability skills for specific careers, so that they are prepared to survive in the job market for the next 30 or 40 years. (Alenezi, 2021).

Digital transformation has become a necessity for various sectors, including education. (Kaplan, 2022). Digital transformation in industrial engineering (IT) is intended to integrate digital technology into the education and research process, and prepare graduates who are competent in utilizing digital technology to solve industrial problems effectively and efficiently. Digital transformation is changing every aspect of the industry. At its core, digital transformation in engineering refers to the strategic integration of digital technologies into traditional engineering practices and processes with the benefits of increased efficiency, improved collaboration and identifying problems more quickly. (Olmstead, 2024).

Industrial Engineering higher education in Indonesia has been running for more than 50 years and is currently growing very rapidly. Industrial Engineering has become one of the highest number of undergraduate and postgraduate higher education programs and is widely spread in almost all provinces in Indonesia. The latest data shows that there are 258 undergraduate Industrial Engineering Study Programs registered in the Higher Education Database of the Ministry of Education and Culture (2022) and actively operating.

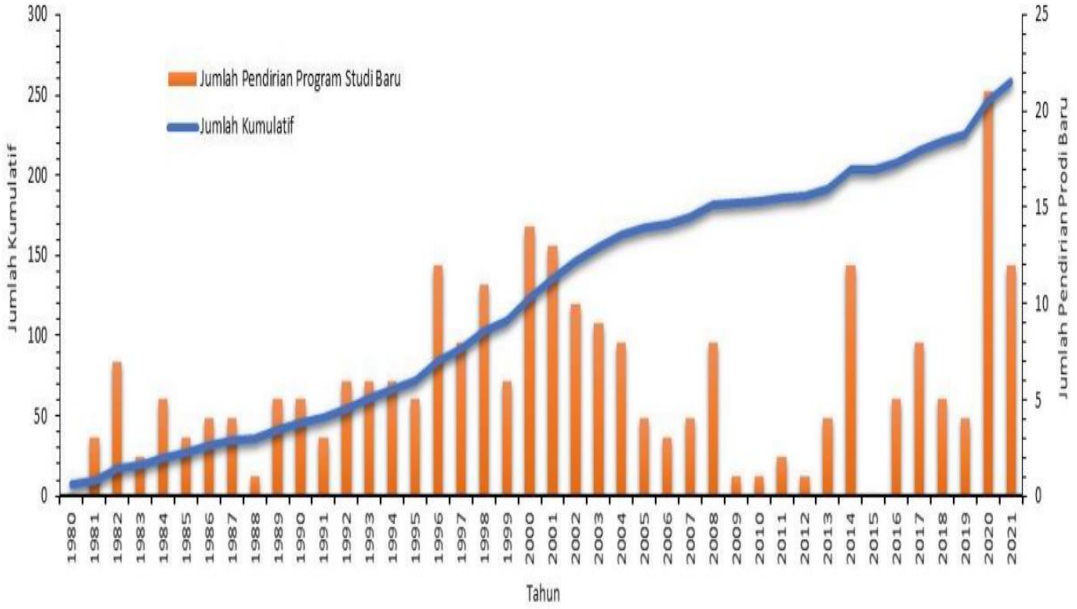

Figure 1. Growth of Undergraduate Industrial Engineering Study Programs in Indonesia
Source: (Indonesian Industrial Engineering Higher Education Organizer Cooperation Agency, 2022

Bakrie University's Industrial Engineering (TIN) study program is often known as one of the engineering study programs but its course material combines Engineering, Management, and Social. Although Industrial Engineering is a derivative of Mechanical Engineering, this study program focuses on emphasizing the Management side of an industry. Industrial Engineering focuses on emphasizing Techno-Socio-Economic aspects that involve engineering and socio-economic science in problem solving. This aspect is used through the concept of a system approach based on 5M + E, namely *Man, Money, Machine, Method, Material* and Energy. (*What is the Role of Industrial Engineering in Digital Transformation? - *, 2023).

TIN as one of the study programs that focus on designing integrated and efficient work systems, needs to adapt to this digital era. Digital transformation in TIN Study Program can be done by integrating digital technology in the teaching and learning process. In the aspect of definition in the digital era, it is not a big change because of course the meaning from the beginning in the realm of insuri will not change just like that. Likewise with the abstraction aspect where the picture is static. However, the transformation of industrial engineering in the digital era is very visible in the aspect of expression. For example, previously the mapping process was done manually, now with digitalization it can be done through simulation. Of course, digitalization makes industrial engineering workflow more effective. (*Industrial Engineering Transformation in Facing the Digital Era - Bakrie University*, 2023).

With the existence of *industrial standard workstations* that become IOT *based manufacturing systems* in Industrial Engineering laboratories where students can

conduct experiments on industrial processes that are similar to those that occur in factories Digital transformation can be found in the Industrial Engineering Laboratory. Button-shaped sensors are applied as a combined form of technology and digital (digitalization) IOT *based* certainly includes data from the *cloud system*. Furthermore, there is a deep connection between Industrial Engineering and *Data Science*, which is often mistakenly thought to be limited to the IT field. In industry, *Data Science* plays an important role in data processing for machine and equipment *maintenance* prediction.

The purpose of this research is to contribute to the practical understanding of the Governance of Digital Transformation Initiatives in the Industrial Engineering Study Program of the Ubakrie Faculty of Engineering and Computer Science (TIN) by understanding the key dimensions that need to be considered in managing digital transformation initiatives. This research is also expected to develop a suitable model or framework for effectively managing digital transformation initiatives. Therefore, the research is expected to explain the grand theory underlying the importance of digital transformation initiative management in Industrial Engineering study programs.

LITERATURE REVIEW

Change Management

Change management is the application of processes and tools to manage the human side of change from a current state to a new future state so that the desired outcome of the change (and expected return on investment) can be achieved. (Hiatt & Creasey, 2012). Effective change management is more than just the role of the project team it is also the responsibility of every executive, manager, and supervisor in the organization. Change management is a framework that makes it possible to manage the human side of change. (Hayes, 2022). The reasons for change are as varied as the changes themselves: revenue growth, increased customer satisfaction, cost reduction, improved product or service quality, decreased risk exposure, improved quality of life, and so on. Projects and initiatives are undertaken not because they are fun and exciting, but because an opportunity presents itself or a problem must be solved; most importantly, an opportunity to meaningfully improve performance (Hiatt & Creasey, 2012).

Change management is seen as a process, and events, decisions, actions, and reactions are seen as interconnected, involving seven core activities (Hayes, 2022)The seven activities are:

1. *Recognizing the need for change* and *starting the change process*,
2. *Diagnosing what needs to be changed* and *formulating a vision* of *a preferred* future *state*,
3. *Planning how to intervene in order to achieve the desired* change,
4. Leading and *managing the people issues*,
5. *Implementing plans* and *reviewing progress*,
6. *Sustaining the change*, and
7. *Learning*.

Digital Transformation

Digital transformation is an evolutionary process that leverages digital capabilities and technologies to enable business models, operational processes, and customer experiences to create value'. (Morakanyane & Grace, 2017). According to Upradista, Digital transformation is the transformation of activities, processes, competencies, and business and organizational models to fully leverage the changes and opportunities of diverse digital technologies and their accelerating impact across industries in a strategic and prioritized manner, with an eye on current and future shifts. (Upadrista, 2021)According to Andreas Kaplan, Digital Transformation is considered a strategy to utilize technology to deliver knowledge to students. The technologies referred to in this transformational context include cloud computing, the *Internet of Things*, data analytics, virtual and *augmented* reality, and artificial intelligence. (Kaplan, 2022)All three definitions emphasize the use and adoption of digital technologies, and the holistic transformation of an organization required to create value.

The main objectives of digital transformation in higher education as stated by (Zitter, 2022) Leaders in higher education consistently mention four main objectives.

1. Improve students' learning environment,
2. Improve the operational efficiency of their programs,
3. Increase computing power for cutting-edge research, and
4. Stimulate innovation in education.

Digital Maturity Model

Maturity models are a well-known method in the literature for measuring organizational maturity. Digital maturity can be defined as the state of digital transformation in an organization (Alenezi, 2021). The maturity model is a method or framework for measuring the level of maturity and a blueprint for developing an entity within the company. (Bruin et al., 2005). The digital maturity model helps companies to assess their ability to deal with digital transformation based on predetermined dimensions. Especially in the transformation journey, this model can help understand the current state and ability of the organization to systematically manage and guide digital transformation efforts. (Teichert, 2019). With maturity assessments carried out, an organization can find out which areas have not been properly managed and documented. According to (De Carolis et al., 2017) Digital maturity requires level measurement to state the company's digital readiness through a maturity level scale. There are many experts who divide the level into 5 levels. Leipzig et al and De Carolis et al. who conducted research in the field of business companies divided digital maturity into 5 levels. Then Redjep et al. Conducting research on educational institutions also divides digital maturity into 5 levels. Although different research subjects but there are still business processes in each organization. They use different level names but with the same level of value.

						Transformed	
					Integrated		
				Defined			
			Conceptual				
		Unaware					
	Culture						
	Technology						
	Strategy						
	Organization						
	Customer						
	People						

Figure 2 *Maurity* Level *Model* (Azhari et al., 2014)

The levels in the model above can be interpreted as follows:

1. The first level, *unaware*, describes Organizations that do not have a strategy for digital transformation, nor do they have digital competencies in place. These organizations do not yet offer any digital products or services, and have no overall organizational awareness of the need for digital transformation.
2. Second, *conceptual*, defined as organizations that offer some digital products, but still without a digital strategy.
3. Third, the Organization with a *defined* level of digitalization, is a company that is able to consolidate the experience gained from the pilot implementation into a partial strategy. At this stage, a culture of digital thinking is taking root in the Organization. The profitability of these partial strategies and the effects of the pilot implementation are assessed and used to develop the overall digital strategy.
4. Four, at the point of *integrated*, where a clear digital strategy has been developed, the organization enters the maturity level.
5. Fifth, *transformed* at this level, the organization can be classified at a level where the strategy is implemented across products and business processes.

The digital maturity level that is now defined is a reference in this research. With the level of each *digital maturity* factor, the organization can make *continuous improvement* gradually in order to reach the final level (level 5). Each factor level will be evaluated so that the organization can apply technology according to the needs of the organization and its resources. In addition, the organization can also map and do technology planning in the future. With that, the application of technology will be effective in terms of processes and human resources and efficient in terms of time and funding. In order for the Organization to be assigned a certain maturity level and to make the evaluation results comparable across all assessment dimensions, a scoring procedure is applied. The maximum achievable assessment value is 100% for each dimension, which corresponds to the maturity level of the company. The assignment to a

maturity level is done by means of the calculated assessment value falling within one of the five maturity levels according to the five maturity ranges.

Challenges of Digital Transformation in Higher Education Institutions

Key challenges relevant to digital transformation in higher education institutions, there are many challenges faced by higher education institutions in digital transformation. (Andrews Dennis, 2023) They are:

1. Changing student needs
   IT systems need to adapt to changing student needs and industry regulations. Unless institutions commit to change management, they may fail in digital transformation.
2. Technology challenges
   Many colleges and universities use legacy technology systems that are fragmented and difficult to use. They are also insecure and poorly integrated to provide the best digital transformation experience in the classroom.
3. Lack of IT support and governance
   Most institutions fail in their digital transformation efforts due to the lack of an effective roadmap to guide them. The two best models here are the hub-and-spoke model, where multiple subcommittees report to one larger strategic committee, usually called the IT steering committee. The second model - the Parallel model - is more effective for larger institutions, where teams for different IT functions work together to make decisions. (Andrews Dennis, 2023).
4. Lack of necessary skills
   Higher education organizations are generally understaffed and underfunded. Few of these institutions have the necessary resources to attract and retain the quality IT talent needed for ambitious digital transformation.

METHODOLOGY

This research uses a descriptive qualitative approach to explore and explain the governance of digital transformation initiatives at Bakrie University's Industrial Engineering Study Program. This approach allows researchers to deeply understand how institutions manage digital change and technology implementation, as well as how it affects various aspects of higher education. By focusing on the description and interpretation of phenomena that occur, this research aims to provide a comprehensive insight into the governance practices and challenges faced during the digital transformation process. This research was conducted at the Industrial Engineering Study Program, Faculty of Economics and Social Sciences, Bakrie University, located in Jakarta, Indonesia. This location was chosen as the university is actively implementing various digital initiatives in curriculum and administration. The research subjects included the head of the study program, lecturers, administrative staff, and students of the Industrial Engineering Study Program. This selection of subjects aims to gain a comprehensive perspective on the implementation and impact of digital transformation from the various parties involved.

Primary data was collected through in-depth interviews with study program leaders, lecturers, administrative staff, and students. Direct observation of academic activities and the use of digital technology were also used as primary data. Secondary data in this study included institutional documents such as digital transformation policies, annual reports, updated curriculum materials, and related publications and articles documenting digital initiatives at the university. The number of informants in this study was 20 people, consisting of 3 study program leaders, 5 lecturers, 2 administrative staff, and 10 students. The selection of this number was designed to ensure a wide enough representation of different perspectives within the institution.

Data collection techniques include in-depth interviews, participatory observation, and document study. Interviews were conducted in a semi-structured manner to extract detailed information about informants' experiences and views regarding digital transformation. Participatory observation was conducted to see firsthand how technology is used in daily academic activities. Document studies were used to analyze related policies and documents. The data analysis technique uses a thematic analysis approach. Data from interviews, observations, and documents were analyzed to identify key themes, patterns, and relationships between various aspects of digital transformation governance. The analysis was conducted by coding the data, grouping the themes, and drawing conclusions based on the patterns found.

To ensure the validity of the data, source and method triangulation were used. Source triangulation involves verifying information through interviews with various informants from different backgrounds (leaders, lecturers, staff, and students) to ensure consistency and validity of information. Method triangulation involves the use of various data collection techniques such as interviews, observations, and document studies to obtain a more holistic view and verify findings from multiple perspectives. These techniques help ensure that the research results are accurate, trustworthy and reflect the complex reality of digital transformation governance.

RESEARCH RESULT

Digital Transformation in Higher Education: Digital transformation in higher education includes not only the application of new technologies, but also changes in the organizational structure, processes, and culture of the institution. This research explores how the governance of digital transformation initiatives at Universitas Bakrie's Industrial Engineering Study Program was implemented and the challenges faced during the process. Industrial Engineering Study Program at Bakrie University: The Industrial Engineering Study Program at Bakrie University is known for its commitment in integrating technology with education. The program focuses on improving the quality of education through digital technology innovations such as e-learning, digital collaboration platforms, and the use of data analytics in decision making.

The main findings of the study show that Bakrie University adopts a governance framework centered on stakeholder engagement, cross-departmental coordination, and adaptive policy oversight. This framework is

designed to ensure that digital transformation is aligned with the institution's vision and mission. Bakrie University has developed several policies related to digital transformation, including policies on distance learning, information system integration, and data security. These policies are supported by a five-year strategic plan that includes technology infrastructure upgrades and HR training. Leadership at the study program level plays an important role in driving digital transformation. This study found that support from leaders, especially Deans and Heads of Study Programs, is very influential in overcoming resistance to change and in ensuring the participation of all stakeholders. Digital transformation in the Industrial Engineering Study Program has contributed to improving the quality of teaching and learning. The use of Learning Management Systems (LMS) and other digital platforms facilitates access to course materials and improves interaction between lecturers and students.

Change management is a significant challenge in digital transformation. This research found that the active involvement of lecturers, students, and education personnel in the planning and implementation process is critical to the success of this initiative. One of the main obstacles in the governance of digital transformation at Bakrie University is the limitation of technology infrastructure. These limitations include internet bandwidth, hardware availability, and software compatibility issues. Other findings point to curriculum changes that are adaptive to the needs of the digital era. Some courses have been updated to include digital skills such as data analytics, programming, and information systems management, which are relevant for today's industry. The study program identified that digital transformation has a positive impact on students' academic performance. The use of technology in the teaching and learning process increases student engagement and facilitates independent learning. Bakrie University places data security and privacy as a priority in the governance of digital transformation. The research found that policies on cybersecurity have been implemented, but there is still a need for continuous improvement in this area. The Industrial Engineering Study Program at Bakrie University has learned from the best practices of other institutions, both at the national and international levels. Collaboration with other universities and industry is a strategic step in enriching digital transformation governance.

One of the key findings was the importance of a collaborative approach in managing digital transformation. At Bakrie University, collaboration between academic and administrative departments has been key in overcoming the challenges of technology implementation. Academics focus on developing learning content and technology-based teaching methods, while the administration department ensures that technical infrastructure and logistical support run smoothly. Digital transformation enables Bakrie University to utilize data more effectively in decision-making. Data analysis regarding academic performance, student attendance rates, and involvement in extracurricular activities are used to design more targeted interventions. The findings show that data-driven decision-making is becoming an important element in a more adaptive and responsive academic governance.

The results also show that improving the digital capabilities of lecturers and staff is a determining factor in the success of digital transformation. Bakrie University conducts regular training and workshops on the use of educational technology and the management of digital platforms. This not only improves digital competence, but also builds confidence in effectively utilizing technology in teaching and administration. Despite the many benefits of digital transformation, the study revealed resistance from some parties who are reluctant to adapt to technological change. Bakrie University overcame this challenge by promoting transparent communication and involving all stakeholders from the beginning of the planning process to implementation. Mentoring and professional development programs are also implemented to help staff who have difficulty adapting.

Another finding highlights the importance of student engagement in the digital transformation process. Bakrie University initiated a program that allows students to provide input regarding the use of technology in the classroom and their experiences in digital learning environments. Engaging students in these discussions helped the university tailor their approach to better suit the needs and expectations of the main users of the technology. The research found that digital transformation has created a more integrated and flexible learning environment. Students can access learning materials anytime and anywhere through digital platforms. In addition, interactions between lecturers and students have become more dynamic through various digital communication tools, which increases engagement and collaboration in the learning process.

Digital transformation also opens up new opportunities for Bakrie University in expanding partnerships with industry and other educational institutions. These partnerships include digital internship programs, research-based collaborative projects, and digital skills training relevant to industry needs. These collaborations not only enrich the curriculum, but also provide practical benefits for students in entering an increasingly digitalized job market. This research emphasizes the importance of continuous evaluation and adaptability in digital transformation governance. Given that technology and educational needs are constantly evolving, Bakrie University has adopted a constant evaluative approach to assess the effectiveness of their transformation strategy. This includes feedback loops from students and lecturers, internal audits of technology infrastructure, and policy adjustments based on evaluation results.

DISCUSSION

Digital transformation is becoming a major focus in various sectors, including higher education. The governance of digital transformation initiatives in higher education includes strategies to integrate digital technologies in education, teaching, and administrative operations. A case study of the Industrial Engineering Study Program at Bakrie University offers important insights into how this institution manages digital change (Ertmer & Ottenbreit-Leftwich, 2020). Effective governance is needed to ensure that digital transformation initiatives are implemented successfully and can meet the institution's strategic goals. Research shows that digital transformation governance includes policy development, strong leadership, and managing change (DeFilippis, 2021). At

Bakrie University, the governance strategy focuses on stakeholder engagement and cross-departmental coordination to ensure the success of digital transformation.

Strong and visionary leadership is essential in driving digital transformation in educational institutions. Leadership plays a role in setting the vision, managing resources, and overcoming resistance to change (Heath & Heath, 2017). At Bakrie University, the role of deans and heads of study programs in leading and supporting this transformation has proven crucial to achieving alignment with the university's strategic vision. Clear and structured policies are essential to support digital transformation governance. These policies include guidance on digital learning, data security, and the use of technology platforms (Khan et al., 2019). Bakrie University has developed policies that support distance learning, technology integration, and data protection to ensure strong governance. The development of a digital transformation governance framework is a key element to ensure successful implementation. This framework includes mechanisms for coordination, oversight, and continuous evaluation (O'Brien & Jones, 2018). The framework at Bakrie University is designed to integrate a participatory and transparent decision-making process, involving all administrative and academic levels.

Change management is a significant challenge in the digital transformation process. Research shows that resistance to change often stems from a lack of technological understanding or skills (Burnes, 2019). Bakrie University overcomes this resistance through clear communication, training, and mentoring programs to support lecturers and staff in adapting to new technologies. Effective stakeholder engagement is an important part of digital transformation governance. Research shows that involving lecturers, students, and administrative staff in the planning and implementation process increases the success of digital initiatives (Kotter, 2017). Bakrie University practices this approach by ensuring the active participation of all relevant parties in their digital transformation initiatives.

The availability of adequate technology infrastructure is a key element in the success of digital transformation. Several challenges, such as limited bandwidth, hardware, and software compatibility, have been identified at Bakrie University (Chen & Bryer, 2020). Therefore, continuous investment in digital infrastructure is one of the university's top priorities. Enhancing the digital capabilities of lecturers and staff through continuous training and professional development is an important step in digital transformation (Starkey, 2020). At Bakrie University, regular training programs and digital workshops are designed to ensure that lecturers and staff are able to use digital technology effectively in teaching and administrative processes.

Other research also confirms that the use of digital technology in education can enhance students' learning experience by providing wider and more flexible access to learning resources (Sahlberg, 2021). At Bakrie University, digital learning platforms and Learning Management Systems (LMS) have been utilized to enhance interaction between lecturers and students. Periodic evaluation and close monitoring of digital transformation initiatives are essential

to assess their success. Bakrie University uses an evaluative approach that involves feedback from students and lecturers as well as internal audits of technology infrastructure (Al-Hadithy et al., 2018). This approach allows the university to continuously optimize their digital transformation policies and strategies.

Data security and privacy are important aspects of digital transformation governance. Research highlights the need for strict policies on cybersecurity and data protection to avoid the risk of breaches (Wright & Wadhwa, 2019). Bakrie University has implemented strong data security policies as part of their governance framework. Collaboration with industry in the context of digitalization has opened up new opportunities for digital skills-based curriculum development at Bakrie University (Haseeb et al., 2020). This collaboration helps the Industrial Engineering study program to continue to be relevant to market needs and ensure graduates' readiness to face challenges in the digital industry.

One important finding in digital transformation governance studies is the critical role of organizational culture in supporting or hindering digital change. Organizations with cultures that are open to innovation tend to be more successful in adopting new technologies and running digital initiatives effectively (Nambisan et al., 2017). At Bakrie University, digital transformation efforts are supported by an organizational culture that encourages collaboration and openness to new technologies. This is evidenced by the active participation of lecturers and students in adopting new digital platforms and their involvement in the planning and implementation process.

The implementation of digital transformation in higher education should also be reflected in curriculum design that is responsive to technology and industry needs. Research shows that a curriculum integrated with digital technologies not only improves students' technical skills but also develops important competencies such as problem solving, collaboration, and digital literacy (Selwyn, 2021). At Bakrie University, the Industrial Engineering curriculum has been redesigned to include courses that focus on industry 4.0 technologies, such as data modeling, analytics, and automation, which are relevant to current industry needs.

The use of technology in learning provides many benefits, such as greater flexibility, accessibility, and engagement. The digital platform and Learning Management Systems (LMS) at Bakrie University allow students to access learning resources anytime and anywhere, which is crucial to support self-learning and skill enhancement (Sahlberg, 2021). In addition, technology integration also enriches the learning experience through simulations, online collaborative projects, and access to real-time data that strengthens students' conceptual understanding.

Digital transformation presents various risks, including cybersecurity risks, technical errors and cultural resistance. Research underscores that educational institutions need to develop comprehensive risk mitigation strategies to address these challenges (Wright & Wadhwa, 2019). Bakrie University, for example, has adopted strict data security policies and ongoing

training programs to ensure all users understand best practices in using digital technology. These measures are important to mitigate risks and build trust in the newly implemented digital system.

Effective and digitally-oriented leadership is a determining factor in the success of digital transformation in higher education. Research shows that leaders who are proactive in supporting digital innovation tend to be successful in building support across the organization (DeFilippis, 2021). At Bakrie University, deans and faculty leaders play a key role in facilitating technology adoption, including in budget allocation, policy development, and creating a culture conducive to digital change.

Continuous monitoring and evaluation is a critical aspect of digital transformation governance. By using feedback loops involving lecturers, students, and staff, institutions can continuously adjust their strategies and policies to achieve better results (O'Brien & Jones, 2018). Bakrie University routinely conducts internal audits of technology usage and digital learning effectiveness to identify areas that require improvement. Thus, they can remain responsive to the changing needs of education and dynamic technology.

Overall, the governance of digital transformation initiatives at Bakrie University demonstrates the importance of a holistic approach that includes policy development, strong leadership, effective change management, stakeholder engagement, and digital capability development (Selwyn, 2021). The results of this case study can serve as a guide for other educational institutions looking to implement a successful digital transformation.

CONCLUSIONS AND RECOMMENDATIONS

Governance of Digital Transformation Initiatives at Bakrie University's Industrial Engineering Study Program highlights the importance of a comprehensive approach in managing digital change in higher education institutions. This research shows that the success of digital transformation depends on various interrelated factors, such as visionary leadership, development of clear policies and frameworks, and active stakeholder engagement, including lecturers, students, and administrative staff. In addition, the integration of technology in the curriculum, effective risk management, and an organizational culture that supports innovation are key elements that drive the sustainability and effectiveness of this transformation. Bakrie University, in the context of this case study, demonstrates that with the implementation of appropriate governance strategies, institutions can improve the quality of learning, strengthen the competitiveness of graduates, and remain relevant to industry dynamics and market needs. Continuous evaluation and monitoring are also critical components that enable universities to remain responsive to technological developments and ever-changing educational demands. This conclusion emphasizes the need for a holistic and sustainable strategic approach in implementing successful digital transformation in higher education environments.

Recommendations from this study higher education institutions should develop a holistic and sustainable digital transformation strategy by placing strong and collaborative digital leadership at the center of change. Institutions

need to integrate technology effectively in the curriculum, ensuring that it is relevant to industry needs and supports innovative learning. In addition, strong data security policies and ongoing training programs for all stakeholders are needed to manage digital risks and build an organizational culture that is adaptive to technological change. Continuous monitoring and evaluation should be adopted to assess the effectiveness of digital initiatives and enable strategy adjustments that are responsive to the changing dynamics in education and industry. Thus, universities can improve the quality of education, prepare competitive graduates, and maintain relevance in the digital age.

ADVANCED RESEARCH

The limitation of this research lies in its specific focus on one study program and institution, which may limit the generalizability of the findings to other contexts. This case study approach provides in-depth insights into the digital transformation initiatives at Bakrie University, but may not fully reflect the challenges, strategies, and dynamics faced by other study programs or institutions with different characteristics. In addition, this research may not fully capture the long-term impact of the digital initiatives, as digital transformation is a process that evolves over time. Therefore, further research with a comparative approach across different institutions or study programs is needed to corroborate the findings and recommend broader best practices.

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