



Key Factors Influencing Digital Transformation Success and Strategic Implications for Indonesian Higher Education: Evidence From IPB University

Nurjana*, Anggraini Sukmawati, Harry Koeswanda

Master of Management Science, Faculty of Management, IPB University, Indonesia.

*Corresponding Author. Email: nananurjana@apps.ipb.ac.id

Abstract: This study aims to identify key factors influencing the success of digital transformation at IPB University, analyze the most influential factors, and propose an optimal strategy to improve its implementation. A quantitative approach was used by distributing questionnaires to 180 respondents consisting of lecturers and educational staff at IPB University. Data were analyzed using multiple regression with SPSS. The findings reveal that digital technology and strategy significantly influence the successful implementation of digital transformation. Digital strategy has the greatest and most significant influence on the dependent variable. This means that the better the implementation of digital strategy within an organization, the higher the level of success of digital transformation. This finding confirms that targeted strategic planning, the selection of appropriate digital initiatives, and the alignment of strategy with organizational goals are crucial factors in driving successful digital transformation. Furthermore, seven key determinants influence the success of digital transformation in higher education institutions: the use of future-ready digital technology, developed digital technology systems, and technology products with user-friendly designs and optimal functionality. Alignment of strategy with the university's vision, mission, and business plan, a clear and structured digital strategy, and strategies that support cross-departmental collaboration within the organization are key determinants of digital strategy. Strengthening digital leadership and governance was identified as the top priority strategies for strengthening internal digital transformation in higher education. This research contributes to the development of digital transformation strategies in higher education, supporting Indonesia's 2045 vision.

Article History

Received: 01-09-2025

Revised: 08-10-2025

Accepted: 17-11-2025

Published: 25-12-2025

Key Words:

Digital Transformation Strategies; Higher Education; Success Factors.

How to Cite: Nurjana, N., Sukmawati, A., & Koeswanda, H. (2025). Key Factors Influencing Digital Transformation Success and Strategic Implications for Indonesian Higher Education: Evidence From IPB University. *Jurnal Kependidikan : Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran, Dan Pembelajaran*, 11(4), 1359-1371. <https://doi.org/10.33394/jk.v11i4.17807>



<https://doi.org/10.33394/jk.v11i4.17807>

This is an open-access article under the [CC-BY-SA License](https://creativecommons.org/licenses/by-sa/4.0/).



Introduction

The education sector has become a center for the creation and dissemination of knowledge that continuously faces challenges in technological developments characterized by rapid globalization, technological disruption, conditions of volatility, inequality, complexity, and ambiguity (Puncreobutr 2021). Innovation needs to be developed to overcome the challenges and changes faced. Innovation should be viewed as an opportunity instead of a threat for higher education institutions (Valdés et al. 2021). An innovation that is developing and gaining global attention is digital transformation.

Digital transformation in higher education entails creating new, more advanced, and effective methods and practices to fulfill the mission of higher education (Alenezi, 2021). Digital transformation is a process in which organizations adopt digital technologies to change the way they operate, interact with customers, and create value (Gkrimpizi et al. 2023). Digital transformation does not only involve the implementation of new technologies,



but also involves changes in organizational culture, processes, and ways of working (Hilda Paola et al. 2024).

On the other hand, the global COVID-19 pandemic has been a major factor driving digitalization in various aspects of human life. The internet plays an important role as a foundation for working, learning, socializing, and accessing public services from home. This has prompted the Indonesian government to fully utilize the digitalization process and integrate it into the way people and organizations work, learn, trade, communicate, and access government services.

The concept of digital transformation in higher education extends beyond merely applying digital technologies; it also involves the advanced transformation of existing teaching and learning models, which is crucial for long-term survival and maintaining a competitive edge (Bisri et al 2023). The strongest impetus for change in higher education comes from today's students, who seek flexible, personalized, and real-time educational experiences. Therefore, the university's vision must prioritize the student experience at its core (Hoskins, 2018). Today's students, often referred to as the digital generation, expect interactive, flexible, and technology-integrated learning, pushing educational institutions to adopt innovative teaching methods (Yesner, 2020). Without such innovation, accessibility will be hindered for students who require flexibility, especially in emergency situations such as a pandemic.

The implementation of digital transformation is essential to ensure that higher education institutions can respond to change, continue to grow, and meet market needs (Benavides et al., 2020). Increasing competition among higher education institutions, there is an urgent need to improve the quality of education and services provided. Abdulrahim and Mabrouk (2020) state that digital transformation can significantly improve administrative efficiency by automating processes such as student admissions, payment systems, and academic data management. Digital transformation can be an effective tool to achieve these goals by improving operational efficiency and student learning experience (Alenezi, 2021). Universities that do not utilize digital technology will continue to rely on conventional methods, which can limit the quality of education and services provided.

The implementation of digital transformation in Indonesian higher education institutions during the COVID-19 pandemic played a significant role in contributing to improving administrative efficiency (Akbari & Pratomo, 2022). Digitalization of education management and administration in higher education through ICT systems such as e-learning and school management systems is proven to increase operational efficiency, so that administrative tasks can be carried out more quickly and accurately (Harini et al. 2024). This is supported by research by Ahyani & Dhuhani (2024), which states that educational office management confirms that digital transformation during the pandemic successfully reduced campus administrative time and costs significantly, while improving the accuracy and transparency of academic public service processes.

Although many universities in Indonesia have begun their digital transformation, there are still significant challenges that need to be addressed. Several studies indicate that infrastructure readiness and resistance to change are the main obstacles to the successful implementation of technology in higher education (Valdés et al., 2021).

As a state-owned university, IPB is actively pursuing digital transformation toward a digital campus to support business processes and educational, research, and community service activities. Since 2018, IPB has been improving its digital infrastructure and integrating information systems so that academic, human resources, student affairs, and financial matters are integrated by providing services through smart mobile apps (Barlian,



2020). IPB's vision is to become a research-based university and a leader in innovation at the global level as a form of adaptation to change. To achieve this vision, IPB's missions are outlined in a strategic plan document with specific objectives across various aspects. One of these is the institution's adaptation to digital technology developments, which is identified as a strategic issue that must be addressed. The digital transformation integration being implemented spans various fields, including curriculum, learning systems, infrastructure, and human resources.

The main purpose of this strategic plan is for IPB to be able to adapt and have resilience to disruption, including the challenges and demands of the industrial revolution 4.0, increasing innovation, and advanced technological advances in a sustainable manner. The main focus of this digitalization transformation is the application of digitalization that not only improves academic activities but also encourages progress in various sectors. By utilizing information and communication technology, IPB University facilitates wider access to information and fosters more intensive interaction between students, lecturers, and the community. Initiatives such as the development of online learning media, the utilization of big data for research purposes, and collaboration with industry in innovative projects are concrete steps towards the integration of digital technology into all aspects of campus activities.

Based on the IPB 2023 performance report, the digital transformation carried out by IPB in the last five years has had a significant impact in various fields. In the field of education, there is an increase in lecturer participation in digital-based learning through various methods. Research has also progressed rapidly as reflected in the number of researches, Scopus-indexed publications, and citation ratios that have increased dramatically thanks to the support of advanced technology such as High Performing Computer (HPC). On the community service side, the Tani Center (Digitani) platform has helped farmers through digital extension. In terms of human resources, the Online DUPAK system makes it easier to manage lecturers' promotion. Finance also showed remarkable progress with the integration of applications that managed to significantly improve the management of endowment funds. Finally, in the field of information and communication technology, network infrastructure development and mobile-based application development further support operational efficiency and accessibility in the campus environment. Overall, this digital transformation has led IPB to greater progress in various aspects of operations and management.

Although IPB University has undertaken various digital transformation initiatives, such as strengthening infrastructure, integrating information systems, and implementing digital applications across various sectors, the long-term success of these efforts still poses challenges that require in-depth study. To date, there has been no comprehensive analysis explaining the key factors determining the success of digital transformation at IPB. Therefore, research is needed to identify and analyze the key factors influencing the successful implementation of digital transformation in higher education.

Knowing the success factors of digital transformation implementation at IPB can support the process of strengthening the digital transformation strategy in the success of IPB's 2024-2028 strategic plan program, so that in the implementation process, there needs to be a strategy to integrate these aspects. IPB University, with a large organizational structure and number of human resources, must be more agile in implementing digital transformation. The implementation of this transformation plays a very important role in contributing to the flexibility of work and can realize smart work that helps increase productivity in the organization (Donnelly and Johns 2021).



Although various previous studies have examined digital transformation in the higher education sector, there is limited empirical research specifically analyzing the determinants of successful digital transformation implementation at public universities in Indonesia, particularly at IPB University. This study seeks to fill this gap by integrating human, technological, and organizational readiness as key elements in building a successful model for digital transformation in higher education. This approach is novel because it provides a more holistic perspective on success factors within the context of public institutions.

The purpose of this research is to identify key factors that influence the successful implementation of digital transformation at IPB University, as well as to develop an optimal implementation strategy that can be applied by other universities in Indonesia. This research contributes to the literature on digital transformation in the higher education sector, especially in the Indonesian context, and provides policy recommendations that can help universities accelerate the adoption of digital technology.

Research Method

This study uses quantitative methods to identify the main factors and supporting factors for the success of digital transformation in higher education. IPB University was chosen because it is one of the state-owned universities (PTNBH) that has been actively developing digital systems since 2018 through the digital transformation roadmap. This shows that IPB has a strategic commitment to academic and administrative digitalization. This study involves 6 variables, namely leadership (Marlizar 2018; Koseoglu et al. 2020 & Laorach & Tuamsuk 2022), digital culture (Boudens et al. 2019; Laorach & Tuamsuk, 2022), technology (Hashem 2019; Singh et al. 2021), HR competencies (Laorach & Tuamsuk, 2022), digital strategy (Laorach & Tuamsuk, 2022; Alojail et al., 2023), and digital transformation implementation (Capusneanu 2021; Laorach & Tuamsuk, 2022). Sampling was conducted from March to May 2025.

The types of data used are primary data and secondary data. Primary data is obtained through a survey method using a questionnaire (Arikunto 2019) distributed online through the help of a Google Form link to respondents. The types of questions used in the questionnaire on Google Form contain structured questions so that respondents are limited in providing answers. Answers to structured questions are arranged on a scale using a Likert scale (summated rating scale). According to (Sugiyono 2021), the Likert scale is utilized to assess the attitudes, opinions, and perceptions of individuals or groups regarding social phenomena or issues. In this study, answers to structured questions were arranged with four alternative answers, namely: value 1 (Strongly Disagree), 2 (Disagree), 3 (Agree), and 4 (Strongly Agree). Secondary data were obtained through in-depth literature searches and reviews, as well as documents deemed relevant to the needs of this study, such as internal IPB University data and scientific publication data.

The sampling method used was non-probability sampling with a purposive sampling technique. The sample was selected based on certain considerations, namely respondents who had worked for at least one year and actively used digital technology in their work activities. IPB is a large university with a large human resource base spread across various faculties and work units. The complexity of this organizational structure limits the ability to obtain specific and centralized employee data. Therefore, the respondents in this study focused on lecturers and educational staff who had been involved in the digital transformation process for at least one year. This selection criterion ensures that respondents have a thorough understanding of and direct experience with implementing digital transformation in their respective work environments, allowing the research results to more accurately and relevantly depict the



realities and dynamics at IPB. According to Hair et al. (2017), the minimum number of samples required uses the 10 times rule, which is 5 to 10 times the largest number of formative indicators used to measure one construct. Based on these considerations, in this study, there were 18 indicators, so the minimum sample size in this study was $10 \times 18 = 180$ respondents.

To identify the factors influencing the implementation of digital transformation, researchers utilized SPSS software, which can perform multiple linear regression analysis (Ghozali 2017:19). The analysis began with validity and reliability tests. Results were considered valid if the significance value was <0.05 , and reliable if the Cronbach's alpha value exceeded 0.7. Based on these test results, all questionnaire items were proven valid and reliable.

Furthermore, the classical assumption test consists of a normality test, a multicollinearity test, and a heteroscedasticity test. The results of this study meet all the requirements of the classical assumption test. Furthermore, multiple linear regression analysis was carried out using the equation formula, namely $Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + e$ (1). Based on this analysis, the main objective is to see to what extent leadership (X1), digital culture (X2), technology (X3), HR competencies (X4), and digital strategy (X5) contribute to the implementation of digital transformation (Y). The coefficients b_1 , b_2 , b_3 , b_4 , and b_5 show how strong the influence of each independent variable is on the dependent variable. If the coefficients b_1 , b_2 , b_3 , b_4 , and b_5 are significant, it can be concluded that leadership, digital culture, technology, HR competencies, and digital strategy have a strong influence on the implementation of digital transformation.

Results and Discussion

Characteristics of Respondents

The characteristics of respondents involved in digital transformation execution are reviewed based on position, length of service, age, gender, and final level of education. The majority of respondents were female. This is evident from the number of female respondents, which amounted to 102. Gender was not used as a variable in the analysis of the results in this study; thus, gender bias is ignored. The largest age group was 41-45 years old, with a percentage of 25 percent. This indicates that this age group is currently at the peak of their productivity and career maturity. Furthermore, the majority of respondents, or approximately 23 percent, had worked for 6-10 years.

Most respondents have a doctoral degree. This shows that the majority of respondents have a high level of education and may indicate involvement in the process of internalizing digital transformation in higher education. The type of position in this study targets the roles involved in the implementation of digital transformation, consisting of Lecturers and Education Personnel, with a balanced number of 90 people each. The balanced composition of the position shows that the possibility of bias in the research results due to differences in the number of respondents between positions can be minimized. Table 1 also presents data showing that all work units have representatives of respondents who are sampled in this study. The work unit with the most respondent representatives is the Faculty of Economics and Management as many as 25 people or around 14 percent. This is because this research targets potential employees in each faculty, school, and directorate in IPB.

Validity and Reliability Test

The validity test results show that all statement r-count values are greater than the r-table value of 0.146. In addition, the significance value also shows a value smaller than 0.05. Furthermore, the results of the questionnaire reliability test show that the Cronbach alpha

value of variable X1 is 0.721, X2 is 0.738, X3 is 708, X4 is 826, X5 is 871, and Y is 0.817. These values show numbers greater than 0.7. Therefore, it can be concluded that all questionnaire instruments are reliable.

Classical Assumption Test

a) Normality Test

The normality test is conducted to determine whether the independent variable regression model, the dependent variable, or both follow a normal distribution. This study employed the Kolmogorov-Smirnov Test for statistical analysis. Data is considered to have a normal distribution if the significance value obtained from the Kolmogorov-Smirnov Test has a value greater than 0.05. The results can be seen in Table 1 below.

Table 1. Kolmogorov-Smirnov Test Results Initial Model

		Unstandardized Residual
N		180
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	1.42993253
Most Extreme Differences	Absolute	.080
	Positive	.080
	Negative	-.063
Test Statistic		.080
Asymp. Sig. (2-tailed) ^c		.007

Source: Data processed (2025)

Based on this table, the normality test results show that the residuals are normally distributed ($p > 0.05$), so the model is considered to fulfil the assumption of residual normality.

b) Multicollinearity Test

In a good regression model, there should be no perfect or near-perfect correlation between the dependent variables (close to or equal to 1), it can be seen in Table 2 below.

Table 2. Multicollinearity Test Results

Model	Collinearity Statistic	
	Tolerance	VIF
1 (Constant)		
Leadership	0,595	1,681
Digital Culture	0,558	1,791
Technology	0,551	1,814
HR competence	0,553	1,877
Digital Strategy	0,506	1,975

Source: Data Processed (2025)

In this table, it can be seen that all independent variables in this study have a tolerance value greater than 0.1 and a VIF value smaller than 10. Based on these results, it can be concluded that in the multiple linear regression model used in this study, there are no multicollinearity symptoms.

c) Heteroscedasticity Test

Heteroscedasticity test results can be seen through the Glejser test, conducted by regressing the absolute value of residuals on independent variables, which can help in identifying symptoms of heteroscedasticity in the regression model. Data can be declared not to experience symptoms of heteroscedasticity if the significance value

resulting from the Glejser test has a number greater than 0.05. The related results of the Glejser test can be seen in Table 3.

Table 3. Glejser test results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4,077	1,943		2.098	0,037
Leadership	-2,629	1,831	-0,137	-1,436	0,153
Digital Culture	3,512	1,914	0,181	1,834	0,068
Technology	-0,783	1,806	-0,043	-0,434	0,065
HR competence	-0,350	1,561	-0,023	-0,224	0,823
Digital Strategy	-2,137	1,386	-0,160	-1,542	0,125

Source: Data processed (2025)

Based on Table 3, it can be seen that the Sig. value of leadership is 0.153, digital culture is 0.068, technology is 0.065, HR competence is 0.823, and digital strategy is 0.125. The five numbers show numbers greater than 0.05. This figure meets the conditions where the data can be declared not to experience symptoms of heteroscedasticity.

Multiple Linear Regression Analysis

Multiple linear regression analysis is used to analyze the influence of leadership variables, digital culture, technology, HR competencies, and digital strategy on the implementation of digital transformation in higher education. The results of the multiple linear regression analysis can be seen in Table 4.

Table 4. Multiple linear regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-22,199	3,217		-6,902	<0,001
Leadership	4,958	3,031	0,111	1,636	0,104
Digital Culture	1,187	3,170	0,026	0,374	0,709
Technology	12,761	2,990	0,300	4,267	<0,001
HR competence	3,459	2,585	0,096	1,339	0,182
Digital Strategy	11,399	2,295	0,364	4,967	<0,001

Source: Data processed (2025)

Based on the coefficient values in Table 4, the following regression equation can be formed:

$$Y = -22.199 + 4.958X_1 + 1.187X_2 + 12.761X_3 + 3.459X_4 + 11.399X_5 + e..(2)$$

Based on the results of multiple linear regression analysis, it is known that all independent variables, namely leadership (X1), digital culture (X2), technology (X3), HR competencies (X4), and digital strategy (X5), have a positive relationship direction to the dependent variable, digital transformation implementation (Y). This shows that in general, an increase in each independent variable tends to be followed by an increase in the implementation of digital transformation. However, statistically, only the technology variable (X3) and digital strategy (X5) are proven to have a significant effect on the implementation of digital transformation (Sig. value <0.05). In addition, Digital Strategy (X5) has the highest t value and the least significance, making it the most significant variable in influencing the implementation of digital transformation. Thus, technology and digital strategy can be considered as key factors that clearly support the successful implementation of digital

transformation in higher education. Meanwhile, although leadership, digital culture, and HR competencies show a positive relationship direction, their influence is not statistically significant in this model.

Coefficient of Determination

The coefficient of determination is used to assess how much variation in the independent variable can account for variation in the dependent variable. The results of the coefficient of determination analysis are presented in Table 5.

Table 5. Results of the coefficient of determination analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,726	0,527	0,514	1,45453

Source: Data processed (2025)

Based on Table 5, it can be seen that the Adjusted R Square value is 0.514. This can be interpreted as the contribution of the independent variables in explaining the dependent variable of digital transformation implementation has a contribution of 51.4%. It also shows that the dependent variable of digital transformation implementation can be explained by other factors outside this study, with a percentage of 48.6%.

T-test

The T-test is employed to demonstrate the extent of the influence of each independent variable individually in explaining the dependent variable (digital transformation implementation), can be seen in table 6 below.

Table 6. T-test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-22,199	3,217		-6,902	<0,001
	Leadership	4,958	3,031	0,111	1,636	0,104
	Digital Culture	1,187	3,170	0,026	0,374	0,709
	Technology	12,761	2,990	0,300	4,267	<0,001
	HR competence	3,459	2,585	0,096	1,339	0,182
	Digital Strategy	11,399	2,295	0,364	4,967	<0,001

Source: Data processed (2025)

A variable is said to have a stronger influence on the dependent variable if its Standardized Beta (β) value is greater than other variables in the model. Furthermore, a variable is said to have a positive and significant influence if its p-value is <0.05 and its t-value is $>$ t-table. The t-table value is obtained through the formula $df = n - k - 1$ with a significance level (α) of 0.05, where n represents the number of samples and k represents the number of independent variables in the study. The t-table value with ($df = n - k - 1 = 180 - 5 - 1 = 174$), the t-table value is around 1.973.

The results can be concluded that leadership ($\beta = 0.111$; $p > 0.104$; t-count $1.636 <$ t-table) has a positive beta value but is not statistically significant. This shows that the leadership variable has no significant effect on the implementation of digital transformation. Susarianto (2024) in an organizational environment that has an established digital structure, the leadership role is more of a passive facilitator than an active director who focuses on integrating technology trends and understanding stakeholders. This is in line with the findings of Muscanell (2024) that when the technology structure has been centralized, and the digital strategy has been institutionalized, the personal or collective influence of the leadership becomes less directly felt.



The digital culture variable ($\beta = 0.026$; $p > 0.709$; $t\text{-count } 0.374 < t\text{-table}$) is the variable with the lowest and insignificant influence on the implementation of digital transformation. According to Feng et al. (2025) that digital culture does not always have a direct effect on the success of digital transformation. The effect is more often long-term rather than the end result that can be directly measured. Therefore, the impact tends not to be seen directly, especially in digitally established institutions.

Furthermore, the technology variable ($\beta = 0.300$; $p < 0.001$; $t\text{-count } 4.267 > t\text{-table}$) has a significant effect on the implementation of digital transformation. This finding is in line with research by Alenezi (2021) that high digital technology readiness in the higher education environment significantly improves the operational efficiency of institutions and enriches the student learning experience. Digital technology is not only used as a learning tool but also transforms academic and administrative management processes towards a more responsive, efficient, and sustainable system. This result is also supported by Gkrimpizi et al. (2023) that advanced technology and integrated information systems tend to be more successful in implementing digital initiatives. This result reinforces the finding that the existence and readiness of technology as a major factor in the success of higher education digital transformation. This is in line with H3 of this study, which states that technology has a positive and significant influence on the implementation of higher education digital transformation, so that the hypothesis can be accepted.

The HR competency variable ($\beta = 0.096$; $p > 0.182$; $t\text{-count } 1.339 < t\text{-table}$) does not have a significant effect on the implementation of digital transformation. HR competencies may be insignificant because measurements are based on perceptions, not on performance assessment or objective certification. (Damanhuri & Hartono 2022 ; Ramadania *et al.* 2024). Measuring competence through perception has the potential to cause bias, and the results do not fully reflect the reality of employee competencies needed for successful digital transformation.

Lastly, the digital strategy variable ($\beta = 0.364$; $p < 0.001$; $t\text{-count } 4.967 > t\text{-table}$) has a significant influence and is the factor with the greatest contribution to the implementation of digital transformation. These results are supported by research Laorach & Tuamsuk (2022) found that digital strategies designed in line with the vision and mission of higher education institutions have a significant influence on the success of digital transformation. In addition, Ardiansyah (2022) states that the implementation of a structured digital strategy is a very crucial aspect in order to integrate technology into various aspects of activities in higher education. That way, universities can achieve a level of digital development that is able to support sustainability and improve the quality of academic services. Therefore, a structured digital strategy is considered the main foundation to ensure a thorough and effective integration of technology in all aspects of higher education activities. This is in line with H5 of this study, which states that strategy has a positive and significant influence on the implementation of higher education digital transformation, so that the hypothesis can be accepted.

Overall, based on the results of the T-test, only the technology variable (X3) and digital strategy (X5) have a partially significant effect on the implementation of digital transformation. This shows that the availability and application of technology a major factor in driving the success of digital transformation. Similarly, digital strategy also has a significant effect, which indicates the importance of clear digital policy planning and direction in the institutional environment. This is in accordance with the theory of Technology Organization Environment (TOE) by (Tornatzky & Fleischer, 1990) that

technical and organizational aspects are more determinant in the implementation stage of digital transformation.

In contrast, the variables of leadership, digital culture, and HR competencies did not show a statistically significant effect, although theoretically they are often mentioned as important factors in digital transformation. This finding suggests that in the context of the institutions studied, technical and strategic aspects are more decisive than aspects of leadership or organizational culture. Research by Laorach & Tuamsuk (2022) concluded that strategic leadership is a dominant factor in the success of digital transformation in Thailand, but this study was conducted in the context of a campus that is building basic digital infrastructure. Meanwhile, in a study by Alojail et al. (2023) in Saudi Arabia, digital culture is very influential in the early stages of transformation, but the role decreases in the technology consolidation phase. IPB, as a university with medium-advanced digital infrastructure, has gone through phases where leadership, culture, and competence are the main driving factors.

F-test

To test the effect of leadership variables, digital culture, technology, HR competencies, and digital strategy simultaneously on the implementation of digital transformation, the F test is required. The results of the F test can be seen by comparing the F-count and F-table values and looking at the p-value from the SPSS output. The formula used to calculate the F-table is $F\alpha = (df1, df2)$, where df1 is the number of independent variables, while df2 is the number of samples minus the number of independent variables and minus one ($n-k-1$). The number of independent variables used is five variables (leadership, digital culture, technology, HR competencies and digital strategy), and the number of samples is 180 people, so $df1$ is 5 and $df2 = 180-5-1 = 174$. The result of the F-table with a value of ($df1 = 5$, $df2 = 174$, and α of 0.05) is 2.27. The results of the F test can be seen in Table 7.

Table 7. F-test results

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	410,623	5	82,125	38,812	<0,001
	Residual	368,177	174	2,116		
	Total	778,800	179			

Source: Data processed (2025)

Based on Table 7, the F-count value is 38.812, which is greater than the F-table value of 2.27. In addition, the p-value (Sig.) also shows a result of 0.001, which is smaller than 0.05. Therefore, it can be concluded that the variables of leadership, digital culture, technology, HR competencies, and digital strategy simultaneously have a positive and significant effect on the implementation of digital transformation. This means that a joint increase in these five factors can encourage an increase in the implementation of digital transformation in higher education.

Managerial Implications

Digital transformation in higher education requires a distinct strategic focus for each aspect. Digital technology and strategy must be a priority for investment and policy attention, as they play a crucial role in improving operational efficiency, data-driven decision-making, and the quality of learning. The implementation of AI, big data, and a Strategic Digital Plan must be systematically optimized. Meanwhile, visionary leadership and a digital organizational culture require long-term capacity building through consistent vision communication, ongoing training, and strengthening the values of openness and adaptability. Therefore, digital transformation is not just about technology, but also about developing leadership and culture to prepare higher education institutions to compete in the digital era.



Conclusion

The results of the analysis show that of the five variables studied, namely leadership, digital culture, technology, human resource (HR) competencies, and digital strategy, only technology and digital strategy variables have a significant influence on the implementation of digital transformation. Technology variables proved to be the main factor supporting operational efficiency and student learning experience, while digital strategy contributed to providing a clear direction for planning and implementing transformation initiatives.

Although leadership, digital culture, and HR competencies are theoretically considered important, the results show that their influence is not significant in the context of institutions that already have an established digital infrastructure. This suggests that at certain stages, technical and strategic aspects such as technology and digital strategy are more dominant than organizational and cultural aspects at IPB University as the main drivers in digital transformation. Overall, this research makes an important contribution to the development of digital transformation strategies in higher education. By understanding the factors that influence the success of digital transformation, IPB University can design more appropriate policies to improve HR readiness, strengthen technological infrastructure, and build an adaptive organizational culture.

Recommendation

Strategic recommendations for universities to improve the effectiveness and sustainability of digital transformation: 1) Strengthen technological infrastructure through investment in advanced and integrated technological infrastructure. 2) Implement a structured digital strategy and evaluation mechanism to measure the effectiveness of digital transformation implementation. 3) Develop human resource competencies, especially in terms of digital skills. 4) Build an adaptive digital culture that supports innovation and adaptation to technological changes. 5) Proactive and visionary leadership is needed to drive digital transformation in universities. 6) Continuous evaluation and adjustment of digital transformation implementation to identify challenges, opportunities, and effectiveness in achieving IPB University's vision as a leading university based on global research and innovation.

References

- Abdulrahim, H. & Mabrouk, F. (2020). COVID-19 and the digital transformation of Saudi higher education. *Asian Journal of Distance Education*, 15(1), 291-306
- Ahyani, E., & Dhuhani, E. M. (2024). Digital Transformation in Education Office Management: A Literature Review. 12(April), 205-215.
- Akbari, T. T., & Pratomo, R. R. (2022). Higher education digital transformation implementation in Indonesia during the COVID-19 pandemic. *Journal of Communication Studies*, 10 (1), 52. <https://doi.org/10.24198/jkk.v10i1.38052>
- Alenezi, M. (2021). Deep Dive into Digital Transformation in Higher Education Institutions. *Education Sciences*, 11 (770), 1-13. <https://doi.org/https://doi.org/10.3390/educsci11120770>
- Alojail, M., Alshehri, J., & Khan, S. B. (2023). Critical Success Factors and Challenges in Adopting Digital Transformation in the Saudi Ministry of Education. *Sustainability (Switzerland)*, 15(21). <https://doi.org/10.3390/su152115492>
- Ardiansyah, D. (2022). Higher Education Digital Transformation. 20(1), 42-55.
- Arikunto, S. (2019). *Prosedur Penelitian*. Jakarta: Rineka cipta.
- Bisri, A., Putri, A., & Rosmansyah, Y. (2023). A Systematic Literature Review on Digital



- Transformation in Higher Education: Revealing Key Success Factors. *International Journal of Emerging Technologies in Learning*, 18 (14), 164-187. <https://doi.org/10.3991/ijet.v18i14.40201>
- Boudens J, Palmer R, Weddle B. 2019. Mobilize your organization with a powerful change story. McKinsey & Company. [diakses 2021 Des 03]. <https://www.mckinsey.com/business-functions/people-and-organizationalperformance/our-insights/the-organization-blog/mobilize-your-organization-with-a-powerful-change-story>
- Castro Benavides, L. M., Tamayo Arias, J. A., Arango Serna, M. D., Branch Bedoya, J. W., & Burgos, D. (2020). Digital Transformation in Higher Education Institutions: A Systematic Literature Review. *Sensors (Basel, Switzerland)*, 20 (11), 1-22. <https://doi.org/10.3390/s20113291>
- Damanhuri, & Hartono, R. S. (2022). The Influence of Digital Competence and Learning & Development on the Achievement of Digital Transformation at the Directorate General of Post and Information Technology, Ministry of Communication and Information. *Journal of Government Science*, 10, 21-34.
- Feng, J., Yu, B., Tan, W. H., Dai, Z., & Li, Z. (2025). Key factors influencing educational technology adoption in higher education: A systematic review. *PLOS DIGITAL HEALTH*. <https://doi.org/10.1371/journal.pdig.0000764>
- Ghozali, I. (2017). *Aplikasi Analisis Multivariat Dengan Program SPSS*. Semarang: Badan Penerbit Universitas Diponegoro
- Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of Barriers to Digital Transformation in Higher Education Institutions: Systematic Literature Review. *Education Sciences*, 13 (7). <https://doi.org/10.3390/educsci13070746>
- Hair et al. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) 2th Edition*. Los Angeles, London, New Delhi, Singapore, Washitone DC, Melbourne
- Harini, H., Jauhari, A., Ripki, H., & Putri, A. (2024). Digital Transformation: The Utilization of Information and Communication Technology to Enhance Educational Management Efficiency in the Modern Era. 13, 1668-1674.
- Hashem G. 2020. Organizational enablers of business process reengineering implementation. *Journal Productivity and Performance Management*. [diakses 2025 Juli 20]; 69(2):321-343. doi:10.1108/IJPPM-11-2018-0383
- Hilda Paola, A. G., Morán Santamaría, R. O., Lizana Guevara, N. P., Pedro Otoniel, M. S., Yasser Jackson, S. L., Llonto Caicedo, Y., Cúneo Fernández, F. E., Castro Mejía, P. J., & Pérez Pérez, M. J. (2024). Digital Transformation and Its Relationship to the Job Performance of Employees at a Private University in Peru. *F1000Research*, 13, 692. <https://doi.org/10.12688/f1000research.151251.1>
- Hoskins, P. (2018). Transforming Transformation in Higher Education. Vistage. Retrieved July 9, 2021, from [https:// www. linke din. com/ pulse/ trans formi ng- trans forma tion- higher- educa tion- paul- hoski ns/](https://www.linke din. com/ pulse/ trans formi ng- trans forma tion- higher- educa tion- paul- hoski ns/)
- Koseoglu MA, Altin M, Chan E, Aladag OF. 2020. What are the key success factors for strategy formulation and implementation? Perspectives of managers in the hotel industry. *Journal of Hospitality Management*. 89. doi:10.1016/j.ijhm.2020.102574. Laorach, C., & Tuamsuk, K. (2022). Factors Influencing the Digital Transformation of Universities in Thailand. *International Journal of Innovative Research and Scientific Studies*, 5 (3), 211-219. <https://doi.org/10.53894/ijirss.v5i3.646>



- Marlizar A. 2018. Faktor-faktor yang mempengaruhi implementasi strategi yang efektif dalam industri Bank Syariah. *Jurnal Ilmiah Manajemen Muhammadiyah Aceh (JIMMA)*, 8(1). <https://www.ejournal.unmuha.ac.id/index.php/jimma/article/view/578>
- Puncreobutr, V. (2021). Desired Outcomes of Education 4.0: Understandings, Boundaries and Linkages. *St Theresa Journal of Humanities and Social Sciences*, 7 (2), 203-212 WE-Emerging Sources Citation Index (ESC).
- Singh S, Sharma M, Dhir S. 2021. Modeling the effects of digital transformation in Indian manufacturing industry. *Journal Technology in Society*. 67. [doi:10.1016/j.techsoc.2021.101763](https://doi.org/10.1016/j.techsoc.2021.101763)
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta
- Susrianto, B. (2024). Analysis of the Role of Digital Leadership in Digital Transformation in the Public Sector. *Scientific Journal of Informatics Engineering and Information Systems*, 1530–1537.
- Valdés, K. N., Alpera, S. Q. Y., & Suárez, L. M. C. (2021). An institutional perspective for evaluating digital transformation in higher education: Insights from the Chilean case. *Sustainability (Switzerland)*, 13 (17). <https://doi.org/10.3390/su13179850>