

THE EFFECT OF DIGITAL TRANSFORMATION AND DIGITAL INNOVATION ON BUSINESS PERFORMANCE THROUGH DIGITAL LEADERSHIP AT PT BANK NTT IN THE SOCIETY 5.0 ERA

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Abstract:

This study aims to examine how digital leadership mediates the effect of digital transformation and digital innovation on business performance at PT Bank NTT in the Society 5.0 era. This research employs a quantitative method using the Partial Least Squares-Structural Equation Modeling (PLS-SEM) approach to test both direct and indirect relationships among independent, mediating, and dependent variables. The data used are primary data collected through questionnaires distributed to employees of Bank NTT. The sampling technique applied is purposive sampling based on specific criteria. The results of the direct effect testing indicate that digital transformation, digital innovation, and digital leadership have a positive and significant effect on business performance, while digital transformation and digital innovation also have a positive effect on digital leadership. The results of the indirect effect testing show that digital leadership is able to mediate the influence of digital transformation and digital innovation on business performance.

Keywords: Digital Transformation, Digital Innovation, Digital Leadership, Business Performance

INTRODUCTION

The development of digital technology has driven organizations to make strategic changes in work processes, services, and business models. In the era of Society 5.0, technology is viewed not only as a tool for efficiency but also as a means to create human-centered value. Organizations are required to integrate technologies such as artificial intelligence, big data, the Internet of Things, and other digital systems to remain competitive amidst an increasingly dynamic business environment.

The banking sector is one sector severely impacted by digital transformation. Changing customer preferences, the increasing need for digital-based services, and competition among financial institutions require banks to provide services that are fast, secure, easily accessible, and responsive to user needs. In this context, digital transformation and digital innovation are crucial factors in improving business performance, whether through operational efficiency, improving service quality, or enhancing the customer experience.

PT Bank NTT, as a regional development bank, plays a strategic role in supporting regional economic growth. Bank NTT has also developed various digital initiatives, including the "Super Smart Bank" program and the launch of the B'Pung Mobile mobile banking application. The development of these digital services demonstrates Bank NTT's commitment to strengthening competitiveness through the use of technology. Data from this thesis also shows an increase in the number of customer accounts from 1,579,678 in 2020 to 2,069,880 in April 2025, and an increase in credit accounts from 101,841 in 2023 to 117,698 in 2024.

However, the success of digital transformation and innovation is not solely determined by the use of technology. Organizations also need digital leadership capable of guiding change, building



an adaptive culture, increasing digital literacy, and ensuring that technology is truly integrated with business strategy. From a Resource-Based View perspective, digital transformation, digital innovation, and digital leadership can be viewed as strategic capabilities that contribute to an organization's competitive advantage.

Several previous studies have discussed the impact of digital transformation and digital innovation on business performance. However, studies specifically exploring digital leadership as a mediating variable are still limited, particularly in the context of regional banking. Therefore, this study aims to analyze the influence of digital transformation and digital innovation on business performance through digital leadership at PT Bank NTT in the Society era.

Table 1. Direct Effect Hypothesis Testing

Hypothesis	Relationship	Path Coefficient	T-Statistic	P-Value	Decision
H1	Digital Transformation (X1) -> Business Performance (Y)	0.243	2.333	0.022	Accepted
H2	Digital Innovation (X2) -> Business Performance (Y)	0.286	2.782	0.006	Accepted
H3	Digital Leadership (Z) -> Business Performance (Y)	0.356	4.160	0.000	Accepted
H4	Digital Transformation (X1) -> Digital Leadership (Z)	0.676	11.035	0.000	Accepted
H5	Digital Innovation (X2) -> Digital Leadership (Z)	-0.024	0.236	0.814	Rejected

Source: Data processed from thesis, 2026.

Digital Transformation and Business Performance Digital transformation is a process of strategic change through the use of digital technology in business processes, services, work systems, and decision-making. Digital transformation enables organizations to increase efficiency, accelerate services, improve operational quality, and create new value for customers. Therefore, the better the implementation of digital transformation, the greater the organization's opportunity to improve business performance.

H1: Digital transformation has a positive and significant impact on business performance.

Digital Innovation and Business Performance Digital innovation refers to an organization's ability to create new products, services, processes, or business models based on digital technology. In the banking industry, digital innovation can improve service quality, expand customer access, and accelerate transaction activities. Effective digital innovation can strengthen competitiveness and drive improved business performance.

H2: Digital innovation has a positive and significant impact on business performance.

Digital Leadership and Business Performance: Digital leadership is the ability to direct an organization through the use of digital technology. Digital leaders play a role in shaping the digital vision, managing change, driving innovation, and building an adaptive work culture. Strong digital leadership can accelerate the implementation of digital strategies and improve business performance.

H3: Digital leadership has a positive and significant impact on business performance.

Digital Transformation and Digital Leadership. Digital transformation demands changes in organizational leadership patterns. The greater the intensity of digital transformation, the greater



the need for leaders who can understand technology, manage change, and integrate technology into organizational strategy.

H4: Digital transformation has a positive and significant impact on digital leadership.

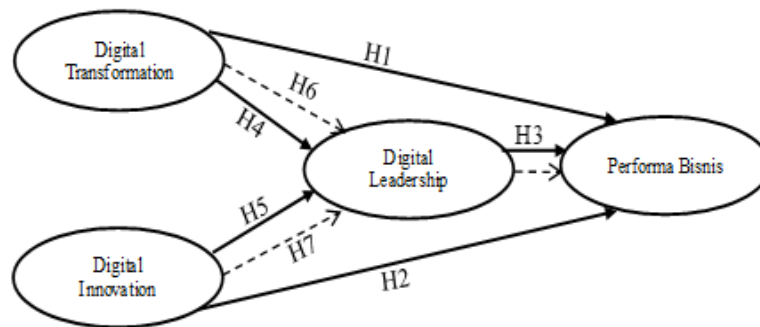
Digital Innovation and Digital Leadership. Digital innovation requires leadership support for the strategic implementation of technology-based ideas. However, digital innovation does not necessarily automatically shape digital leadership if the innovation is still technical or operational in nature.

H5: Digital innovation has a positive and significant effect on digital leadership.

The Mediating Role of Digital Leadership: Digital leadership is seen as a mechanism that can bridge the influence of digital transformation and innovation on business performance. Digital leaders are able to ensure that technology use is not merely a technical activity, but is also directed towards achieving organizational goals.

H6: Digital transformation has a positive and significant impact on business performance through digital leadership.

H7: Digital innovation has a positive and significant impact on business performance through digital leadership.



Source: Processed data (2025)

Figure 1. Conceptual framework

Description:

- = Direct testing
- = Indirect testing
- H = Hypothesis

METHODS

This study uses a quantitative approach with explanatory research methods to examine causal relationships between variables. The research object is PT Bank NTT, with a focus on the influence of digital transformation and digital innovation on business performance through digital leadership.

The data used are primary data obtained through questionnaires distributed to Bank NTT employees. The sampling technique used was purposive sampling, selecting respondents based on specific criteria relevant to the research objectives. The research instrument was structured based on indicators for each variable: digital transformation, digital innovation, digital leadership, and business performance.

Data analysis was performed using Partial Least Squares-Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS 3. The analysis stages include descriptive statistics, evaluation



of the measurement model (outer model), evaluation of the structural model (inner model), and direct and indirect hypothesis testing. Significance testing was performed by examining the path coefficient, t-statistic, and p-value. A hypothesis is considered significant if the t-statistic is greater than 1.96 and the p-value is less than 0.05.

RESULT AND DISCUSSION

Direct Effect Testing. The results of the direct effect test indicate that digital transformation has a positive and significant impact on business performance, with a path coefficient of 0.243, a t-statistic of 2.333, and a p-value of 0.022. Thus, H1 is accepted. These results indicate that the better the implementation of digital transformation at PT Bank NTT, the higher the business performance achieved.

Table 2. Descriptive Statistics of Research Variables

Variable	N	Mean	Median	Min	Max	Standard Deviation
Digital Transformation (X1)	100	2.933	3.000	1.000	5.000	0.826
Digital Innovation (X2)	100	2.967	3.000	1.000	5.000	0.911
Digital Leadership (Z)	100	3.133	3.000	1.000	5.000	0.777
Business Performance (Y)	100	3.113	3.000	1.000	5.000	0.778

Source: Data processed from thesis, 2026

Digital innovation also has a positive and significant effect on business performance with a path coefficient of 0.286, a t-statistic of 2.782, and a p-value of 0.006. Therefore, H2 is accepted. These findings indicate that digital innovation contributes to improved business performance, particularly through the development of services, work processes, and technology-based solutions.

Digital leadership has a positive and significant effect on business performance with a path coefficient of 0.356, a t-statistic of 4.160, and a p-value of 0.000. Therefore, H3 is accepted. These results confirm that digital leadership plays a crucial role in driving organizational performance through strategic direction, technology-based decision-making, and strengthening an adaptive work culture.

Furthermore, digital transformation has a positive and significant effect on digital leadership with a path coefficient of 0.676, a t-statistic of 11.035, and a p-value of 0.000. Therefore, H4 is accepted. These findings indicate that digital transformation can encourage the formation of digital leadership because the transformation process requires leaders who are adaptive, visionary, and able to manage technological change.

Contrary to the previous hypothesis, digital innovation did not significantly influence digital leadership. The test results showed a path coefficient of -0.024, a t-statistic of 0.268, and a p-value of 0.814. Thus, H5 was rejected. It indicates that digital innovation at PT Bank NTT has not been fully integrated at the strategic leadership level, but rather tends to remain at the technical or operational level.

Indirect Effect Test: The results of the indirect effect test indicate that digital transformation has a positive and significant effect on business performance through digital leadership. The path coefficient was 0.241, the t-statistic was 3.894, and the p-value was 0.000. Therefore, H6 was accepted. These results indicate that digital leadership mediates the effect of digital transformation on business performance. The type of mediation formed was complementary partial mediation, as the direct effect of digital transformation on business performance remained significant, while the indirect effect through digital leadership was also significant.



Table 2. Indirect Effect and Mediation Test

Hypothesis	Indirect Relationship	Path Coefficient	T-Statistic	P-Value	Decision	Mediation Type
H6	Digital Transformation (X1) -> Digital Leadership (Z) -> Business Performance (Y)	0.241	3.894	0.000	Accepted	Complementary partial mediation
H7	Digital Innovation (X2) -> Digital Leadership (Z) -> Business Performance (Y)	-0.009	0.226	0.822	Rejected	Direct only/ no mediation

Source: Data processed from thesis, 2026

Conversely, digital leadership was unable to mediate the effect of digital innovation on business performance. The test results showed a path coefficient of -0.009, a t-statistic of 0.226, and a p-value of 0.822. Thus, H7 was rejected. This finding indicates that digital innovation has a more direct influence on business performance, without digital leadership acting as a mediator.

The findings of this study indicate that digital transformation is a crucial factor in improving the business performance of PT Bank NTT. Digital transformation enables organizations to improve work processes, accelerate services, and increase operational effectiveness. In the banking context, digital transformation also provides opportunities to enhance the customer experience through faster, more flexible, and more accessible services.

Digital innovation has also been shown to have a positive impact on business performance. It indicates that the development of digital services, technology-based products, and innovative work processes can contribute to improved organizational performance. However, digital innovation in this study did not have a significant effect on digital leadership. It means that digital innovation does not necessarily directly shape digital leadership patterns if the innovation is not yet part of the organization's leadership strategy.

Digital leadership has been shown to positively impact business performance and mediate the relationship between digital transformation and business performance. These findings emphasize that digital transformation is not simply achieved through technology adoption; it needs to be guided by leaders with digital vision, technological literacy, adaptability, and strategic capacity to manage change.

However, digital leadership does not mediate the relationship between digital innovation and business performance. This situation may occur because digital innovation at PT Bank NTT is likely still predominantly focused on technical aspects, such as application development, digital services, or operational processes, but has not yet fully transformed leadership practices. Therefore, Bank NTT needs to strengthen the link between digital innovation and strategic leadership so that innovation not only results in service improvements but also fosters a stronger digital culture.

CONCLUSION

This study concludes that digital transformation, digital innovation, and digital leadership have a positive and significant impact on PT Bank NTT's business performance. Digital transformation also has a positive and significant impact on digital leadership, while digital innovation has no significant impact on digital leadership.



The results of the mediation test indicate that digital leadership mediates the effect of digital transformation on business performance. However, digital leadership does not mediate the effect of digital innovation on business performance. Therefore, digital transformation requires digital leadership as a strategic mechanism to improve business performance, while digital innovation contributes more directly to business performance.

Practically, PT Bank NTT needs to strengthen its digital leadership through improving digital literacy among leaders, technology-based leadership training, strengthening data-driven decision-making, and integrating digital innovation into organizational strategy. Academically, this research enriches the study of the role of digital leadership as a mediator in the relationship between digital transformation and business performance, particularly in the context of regional banking in the Society 5.0 era.

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