JRSSEM 2026, Vol. 6, no. 1, August
E-ISSN: 2807 - 6311
P-ISSN: 2807 - 6494

The Effect of Intellectual Capital and Digital Transformation on Financial Performance in Technology Companies in Indonesia for the Period 2022 to 2025

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Keywords:
Intellectual Capital, Digital Transformation, VAIC, Financial Performance, ROA, ROE, Technology Sector, IDX.

Abstract

The rapid advancement of digital technology has encouraged technology companies to strengthen their strategic resources and digital capabilities to enhance financial performance. Intellectual capital and digital transformation have become increasingly important factors in developing competitive advantages through effective knowledge management, innovation, operational efficiency, and value creation. This study aimed to examine the effects of intellectual capital and digital transformation on the financial performance of technology-sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2025 period. The study employed a quantitative approach using secondary data obtained from the annual reports and audited financial statements of 30 technology companies. The sample was selected using purposive sampling, resulting in a balanced panel dataset comprising 120 firm-year observations. Intellectual capital was measured using the Value Added Intellectual Coefficient (VAIC™) method, digital transformation was proxied by the ratio of intangible assets to total assets, and financial performance was measured using return on assets (ROA) and return on equity (ROE). The data were analyzed using panel data regression in EViews. The results indicated that intellectual capital and digital transformation had positive and statistically significant effects on both ROA and ROE. Firm size, included as a control variable, also had a positive and statistically significant effect on financial performance. These findings indicate that effective management of intellectual capital and investment in intangible resources associated with digital transformation play important roles in enhancing profitability and sustaining the competitiveness of technology companies in Indonesia.

INTRODUCTION

Advances in information technology and the widespread use of the internet have accelerated digital transformation across various sectors of society (Islam & Bhuiyan, 2022; Kaputa et al., 2022; Kumar et al., 2024; Maroufkhani et al., 2022; Van Veldhoven & Vanthienen, 2022). These developments have not only affected how individuals interact and access information but have also transformed how companies conduct their operations, innovate, and enhance their competitiveness in the digital economy. Based on data from the 2024 National Socioeconomic Survey (Survei Sosial Ekonomi Nasional [Susenas]), the percentage of Indonesia's population with internet access reached 72.78%, representing a consistent increase from approximately 62.10% in 2021. This increase has been driven by the widespread adoption of smartphones, improvements in purchasing power, and the expansion of internet infrastructure to regions outside Java (Agbeyangi & Suleman, 2024; Feng & Qi,

2024; Novianti et al., 2025).

The development of information and communication technology in Indonesia has played an increasingly significant role in supporting the economic and social activities of society (Audina et al., 2024; Fahmi & Mendrofa, 2023; Kadewandana & Kaligis, 2024; Lindawati, 2022; Purnamawati et al., 2023). The public's reliance on technology to access information, communicate, and perform various daily activities continues to increase. Consistent with Sirait's (2024) perspective based on resource-based theory, a company can achieve a competitive advantage when it possesses valuable, reliable, difficult-to-imitate, and non-substitutable resources. In this context, intellectual capital represents a strategic resource that can create added value through the effective management of knowledge, employee expertise, and organizational structures, thereby contributing positively to corporate financial performance, particularly in the technology and digital sectors.

Intellectual capital is commonly measured using the Value Added Intellectual Coefficient (VAIC™), which reflects the efficiency with which a company utilizes human capital, structural capital, and capital employed. Dancakov and Glova (2024) emphasized that a company's ability to effectively integrate these components is essential for achieving higher profitability. This argument is further supported by Liu et al. (2022), who demonstrated that intellectual capital positively affects the financial performance of small and medium-sized enterprises (SMEs), with physical capital and human resources serving as major contributors to firm value. Their findings further indicate that technology-based SMEs exhibit greater human capital efficiency than firms in other sectors.

Digital transformation is a process that fundamentally reshapes a company's organizational structure, business model, operational processes, and interactions with its external environment. The adoption of digital technologies is intended to improve transparency, operational efficiency, and the quality of decision-making. However, during the initial stages of implementation, digital transformation may adversely affect financial performance because it often requires substantial investments in technology acquisition, human resource development, and systems integration (Yin and Id, 2025). Its positive effects may become more apparent when companies effectively manage the transformation process and leverage digital technologies to improve operational efficiency and generate long-term value.

This study examines the effects of intellectual capital and digital transformation on the financial performance of technology-sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2025 period, using panel data from 30 technology companies that published audited financial statements and remained listed throughout the study period. Intellectual capital is measured using the Value Added Intellectual Coefficient (VAIC™), while digital transformation is proxied by the ratio of intangible assets to total assets. Financial performance is measured using return on assets (ROA) and return on equity (ROE), with firm size, measured as the natural logarithm of total assets, included as a control variable. This study extends the research of Sirait (2024) by incorporating digital transformation as an additional explanatory variable and updating the observation period to capture the post-pandemic recovery and accelerated digitalization phase. The study is expected to contribute theoretically to the accounting and strategic management literature while providing practical implications for companies, investors, and academics.

METHOD

Population and Sample

The units of analysis were technology-sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2025 period. The population consisted of 30 technology-sector companies that remained listed throughout the study period and published annual reports and audited financial statements. The sample was selected using purposive sampling based on the availability of complete data required to calculate the Value Added Intellectual Coefficient (VAIC™), the ratio of intangible assets to total assets, firm size, return on assets (ROA), and return on equity (ROE). Over the four-year study period, the final sample comprised 30 companies, resulting in a balanced panel dataset of 120 firm-year observations (30 companies × 4 years).

Data and Data Acquisition Methods

The method in this study uses a quantitative method, according to (Sugiyono, 2023) the quantitative research method can be interpreted as a research method based on the philosophy of positivism, used to research on a specific population or sample, data collection using research instruments, quantitative/statistical data analysis, with the aim of testing the hypothesis that has been determined.

The data selection method used in this study is secondary data, which is information obtained indirectly from pre-existing sources. (Arvyanda et al., 2023) states that secondary data is data obtained indirectly through an intermediary. Secondary data can be obtained through evidence, records, books, journals, or historical reports that have been compiled in archives or documentary data.

This secondary data includes annual reports from companies in the technology sector listed on the Indonesia Stock Exchange (IDX) in the period 2022 to 2025. This information is used to measure research variables, namely intellectual capital, digital transformation, and the company's financial performance.

The sources of information in this study are taken from several official sources that can be accessed by the public, such as the official website of the Indonesia Stock Exchange (IDX), the official website of each company, and other additional sources such as annual reports published by the company.

Data Analysis Methods

In this data analysis method, Sofwatillah et al., (2024) stated that the descriptive quantitative data analysis method is a method that helps describe, show or summarize data in a constructive way. This descriptive statistical method consists of: Mean, calculating the numerical average of a set of values. Median, gets the midpoint of a set of numbers arranged in numerical order. Frequency, indicates the number of times a value was found. Mode, a method for finding the values that appear most often in a dataset. Range, indicating the highest and lowest values. Standard Deviation, shows how close all numbers are to the mean. Skewness, shows the symmetry of the range of numbers by grouping them into curved shapes. It can be in the center of the chart, tilted to the left or right.

The purpose of this analysis is to understand the state of the data and the pattern of value distribution of each variable in the study. Then the data processing method applied in this study is panel data regression, which is a statistical analysis method by combining cross section data (company data) and time series (annual period). Data processing is carried out using software

EViews is a very popular statistical and econometric software for analyzing economic, financial and forecasting data.

The stages of data processing go through several stages, namely descriptive statistical analysis, regression model selection through chow, hausman, and lagrange multiplier tests. As well as classical assumption tests to ensure the feasibility of the model, analyze the regression of the panel data, and then hypothesis testing is carried out.

This approach is applied to evaluate the impact of intellectual capital and digital transformation on the financial performance of technology sector companies in Indonesia listed on the Indonesia Stock Exchange (IDX) during the period 2022 to 2025.

RESULTS AND DISCUSSION

Classical Assumption Test Results

1. Normality Test

a. Variable ROA

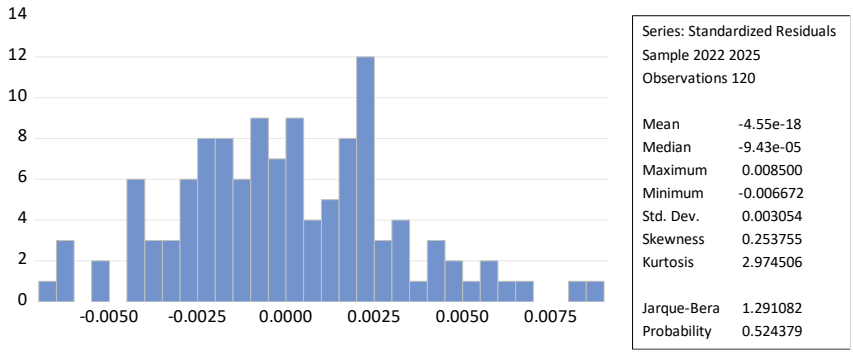

Figure 1. Results of the ROA Variable Normality Test

Based on the results of the ROA normality test above, a *probability value* of 0.524379 was obtained. This value is greater than the significance level of 0.05 or 0.524379 > 0.05, so it can be interpreted that the residual in the ROA regression model is normally distributed. This can be interpreted that the residual data in the ROA regression model is normally distributed, so that the assumption of normality has been met.

b. Variable ROE

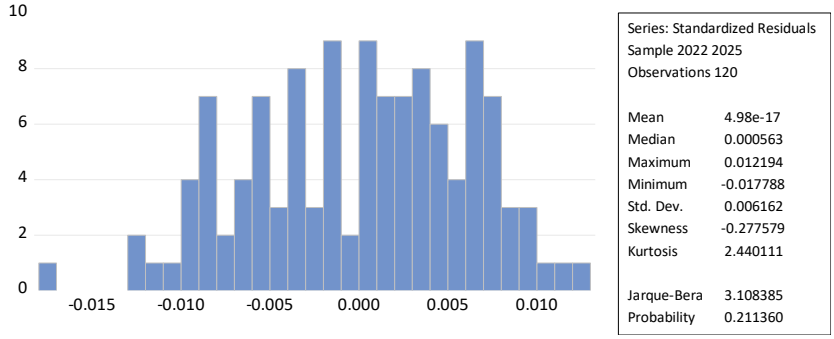

Figure 2. Normality Test Results of ROE Variables

Based on the results of the ROE normality test above, a *probability value* of 0.211360 was obtained. This value is greater than the significance level of 0.05 or 0.211360 > 0.05, so it can be interpreted that the residual in the ROE regression model is normally distributed. This can be interpreted that the residual data in the ROE regression model is normally distributed, so that the assumption of normality has been met.

2. Multicollinearity Test

The multicollinearity test was performed to identify the relationship between variables. A good regression model also has no symptoms of correlation between the variables. The existence of multicollinearity between independent variables can be done by using a correlation matrix with the following conditions:

If the value of the correlation matrix between two variables is >0.90, then there is multicollinearity. And if the value of the correlation matrix between two variables is <0.90, then there is no multicollinearity. The results of the multicollinearity test of this study can be seen as follows:

Table 1. Multicollinearity Test Results

Multicollinearity Test			
Covariance Correlation	*Intellectual Capital*	LNSIZE	*Digital Transformation*
Intellectual Capital			
LNSIZE	0,151509		
Digital Transformation	-0,299965	-0,063744	

Based on the results of the multicollinearity test in the table above, it is known that the entire correlation value between independent variables is less than 0.90. The correlation value between *Intellectual Capital* (IC) and *Digital Transformation* (DT) is -0.299965, *Intellectual Capital* (IC) and *Firm Size* (LNSIZE) is 0.151509, and *Digital Transformation* (DT) and *Firm Size* (LNSIZE) is -0.063744. Thus, it can be concluded that the regression model in this study does not have symptoms of multicollinearity.

3. Heteroscedasticity Test

The heteroscedasticity test was carried out to detect the presence or absence of variance disparity from one residual observation to another. In this study, the heteroscedasticity test was measured using the glycer test with the following conditions:

If the *probability value of the* heteroscedasticity test < 0.05, it can be concluded that heteroscedasticity occurs. Also, if the *probability value of* the heteroscedasticity test is >0.05, it can be concluded that there is no heteroscedasticity test.

a. Variable ROA

Table 2. ROA Heteroscedasticity Test Results

Heteroscedasticity Test	
Variable	Prob.
C	0,0504
Intellectual Capital	0,7748
Digital Transformation	0,6624
LNSIZE	0,6194

Based on the table above, the results of the heteroscedasticity test of the ROA model show that the probability value *of Intellectual Capital* (IC) is 0.7748, *Digital Transformation* (DT) is 0.6624, and *Firm Size* (LNSIZE) is 0.6194. All of these probability values are greater than 0.05. Thus, it can be concluded that in the ROA regression model, there is no heteroscedasticity problem.

b. Variable ROE

Table 3. ROE Heteroscedasticity Test Results

Heteroscedasticity Test	
Variable	Prob.
C	0,0004
Intellectual Capital	0,5177
Digital Transformation	0,5783
LNSIZE	0,3216

Based on the table above, the results of the heteroscedasticity test of the ROE model show that the probability value *of Intellectual Capital* (IC) is 0.5177, *Digital Transformation* (DT) is 0.5783, and *Firm Size* (LNSIZE) is 0.3216. All of these probability values are greater than 0.05. Thus, it can be concluded that in the ROE regression model, there is no heteroscedasticity problem.

4. Autocorrelation Test

The autocorrelation test in the regression model was carried out with the aim of identifying the presence or absence of disruptive variables or correlations in the previous period. In this study, to find out the autocorrelation, it can be seen in the DW (*Durbin Watson*) number, if the DW (*Durbin Watson*) value is between -1.5 and +2.5, then there is no autocorrelation or it is said:

If -1.5< the DW (*Durbin Watson*) value is <2.5 then there is no autocorrelation. If the DW (*Durbin Watson*) value < -1.5 then a positive autocorrelation occurs. If the DW value > 2.5 then a negative autocorrelation occurs. The results of the autocorrelation test in this study can be seen as follows:

a. Variable ROA

Table 4. ROA Autocorrelation Test Results

Weighted Statistics

Root MSE	0,003041	R-squared	0,955225
Mean dependent var	0,185893	Adjusted R-squared	0,954067
S.D. dependent var	0,014434	S.E. of regression	0,003093
Akaike Info Criterion	-8.686320	Sum squared resid	0,001110
Schwarz criterion	-8.593404	Log likelihood	525.1792
Hannan-Quinn criter.	-8.648586	F-statistic	824.9170
Durbin-Watson stat	**2.265358**	Prob(F-statistic)	0,000000

Based on the table above, it is known that the *Durbin-Watson* (DW) stat value in the ROA model is 2.265358. The value is still between -1.5 to +2.5 or -1.5 < 2.265358 < 2.5. It

can be concluded that in the ROA regression model there is no autocorrelation.

b. Variable ROE

Table 5. ROE Autocorrelation Test Results

Weighted Statistics

Root MSE	0,006137	R-squared	0,946260
Mean dependent var	0,233818	Adjusted R-squared	0,944870
S.D. dependent var	0,026582	S.E. of regression	0,006241
Akaike Info Criterion	-7.282445	Sum squared resid	0,004519
Schwarz criterion	-7.189528	Log likelihood	440.9467
Hannan-Quinn criter.	-7.244711	F-statistic	680.8436
Durbin-Watson stat	**2.126727**	Prob(F-statistic)	0,000000

Based on the table above, it is known that the *Durbin-Watson* (DW) stat value in the ROE model is 2.126727. The value is still between -1.5 to +2.5 or -1.5 < 2.126727 < 2.5. It can be concluded that in the ROE regression model there is no autocorrelation.

Classical Assumption Test Results

Based on the results of the classical assumption test above, it can be concluded:

1. Based on the results of the normality test, *the* probability value of the ROA model was 0.524379 and the ROE model was 0.211360. The value is greater than 0.05, so it can be concluded that the residual in the regression model ROA and ROE are normally distributed. Thus, the assumption of normality in both regression models has been fulfilled.
2. The multicollinearity test was performed to identify relationships between independent variables. If the value of the correlation matrix between independent variables is greater than 0.90, then multicollinearity can be expected. On the other hand, if the correlation value is less than 0.90, it can be concluded that multicollinearity does not occur. Based on the results of the multicollinearity test, the correlation value between X1_IC and X2_DT was -0.299965, X1_IC and C_LNSIZE were 0.151509, and X2_DT and C_LNSIZE were -0.063744. The entire correlation value is less than 0.90, so it can be concluded that the regression model does not experience multicollinearity problems.
3. Based on the table of heteroscedasticity test results, the ROA model has *a* probability X1_IC value of 0.7748, X2_DT of 0.6624, and C_LNSIZE of 0.6194 or all of them greater than 0.05, so that the ROA model does not experience heteroscedasticity problems. Meanwhile, in the ROE model, *the* probability value of X1_IC is 0.5177, X2_DT is 0.5783, and C_LNSIZE is 0.3216 or all of them are greater than 0.05, so that the ROE model does not experience heteroscedasticity problems.
4. Based on the table of autocorrelation test results, it is known that *the Durbin-Watson* (DW) stat in the ROA model is 2.265358 and in the ROE model is 2.126727. Both values are still between -1.5 and +2.5, so it can be concluded that the regression model of ROA and ROE does not autocorrelate.

Panel Data Regression Analysis Results

Panel data regression analysis was carried out to find out the direction and how much influence independent variables have on dependent variables. In this study, the regression test of the selected model used *the Common Effect Model* (CEM). The selection of this CEM model

is based on the chow test, thirst test and lagrange multiplier test. Results of the regression of the CEM model:

1) Variable ROA

Table 6. ROA Panel Data Regression Results

Panel data regression analysis test			
Variable	*Coefficient*	t-*statistic*	Prob.
C	0,107545	65.40451	0,0000
Intellectual Capital	0,001100	13.08888	0,0000
Digital Transformation	0,038123	17.17683	0,0000
LNSIZE	0,002474	44.44558	0,0000

Based on the table above, the ROA regression equation is obtained which can be stated as follows:

ROA = 0.107545 + 0.001100(X1_IC) + 0.038123(X2_DT)+0.002474(C_LNSIZE)

The data above shows the results of regression analysis with dependent variables, namely *Return on Assets* (ROA), independent variables, *namely Intellectual Capital* (X1_IC) and *Digital Transformation* (X2_DT), and control variables, namely *Firm Size* (C_LNSIZE). So it can be explained as follows:

a. The value of the dependent variable *Return on Assets* (ROA) was obtained as 0.107545. This can be interpreted that if the variables of *intellectual capital*, *digital transformation*, and *firm size* are zero, then the ROA value is 0.107545.
b. The value of the regression coefficient of the *Intellectual Capital* variable (X1_IC) has a positive value of 0.001100. This can be interpreted that if other variables have a fixed value and *intellectual capital* increases by 1 unit, then ROA will increase by 0.001100.
c. The value of the regression coefficient of *the Digital Transformation* (X2_DT) variable has a positive value of 0.038123. This can be interpreted that if other variables have fixed values and *digital transformation* increases by 1 unit, then ROA will increase by 0.038123.
d. The value of the regression coefficient of the *Firm Size* variable (C_LNSIZE) has a positive value of 0.002474. This can be interpreted that if the other variables are fixed and the *firm size* increases by 1 unit, then the ROA will increase by 0.002474.

2) Variable ROE

Table 7. ROE Panel Data Regression Results

Panel data regression analysis test			
Variable	*Coefficient*	t-*statistic*	Prob.
C	0,096954	29.22393	0,0000
Intellectual Capital	0,002820	16.63686	0,0000
Digital Transformation	0,092923	20.75042	0,0000
LNSIZE	0,004142	36.88843	0,0000

Based on the table above, the ROE regression equation is obtained:

ROE = 0,096954 + 0,002820(X1_IC) + 0,092923(X2_DT) + 0,004142(C_LNSIZE)

The data above shows the results of regression analysis with dependent variables, namely *Return on Equity* (ROE), independent variables, namely *Intellectual Capital* (X1_IC) and *Digital Transformation* (X2_DT), and control variables, namely *Firm Size* (C_LNSIZE). So it can be explained as follows:

a. The value of the dependent variable *Return on Equity* (ROE) is obtained at 0.096954. This can be interpreted that if the variables of *intellectual capital*, *digital transformation*, and *firm size* are zero, then the ROE value is 0.096954.
b. The value of the regression coefficient of the *Intellectual Capital* variable (X1_IC) has a positive value of 0.002820. This can be interpreted that if other variables have a fixed value and *intellectual capital* increases by 1 unit, then ROE will increase by 0.002820.
c. The value of the regression coefficient of *the Digital Transformation* (X2_DT) variable has a positive value of 0.092923. This can be interpreted that if other variables have a fixed value and *the digital transformation* increases by 1 unit, then the ROE will increase by 0.092923.
d. The value of the regression coefficient of the *Firm Size* variable (C_LNSIZE) has a positive value of 0.004142. This can be interpreted that if other variables are fixed and *the firm size* increases by 1 unit, then ROE will increase by 0.004142.

Hypothesis Test Results

1. Simultaneous F Test

The F test is performed to find out whether the independent variables together (simultaneously) affect the dependent variables. In this study, the F test was carried out using a significance value of 0.05. The decision-making in this F test is:

If the value of prob. F-statistic > 0.05 or F-statistic value < F-table, then simultaneously the free variable has no effect on the bound variable. Also, if the value of prob. F-statistic < 0.05 or F-statistic value > F-table, then simultaneously the free variable has an effect on the bound variable.

The results of the F test in this study:

a. Variable ROA

Table 8 F Test Results (simultaneous) ROA

Weighted Statistics			
Root MSE	0,003041	R-squared	0,955225
Mean dependent var	0,185893	Adjusted R-squared	0,954067
S.D. dependent var	0,014434	S.E. of regression	0,003093
Akaike Info Criterion	-8.686320	Sum squared resid	0,001110
Schwarz criterion	-8.593404	Log likelihood	525.1792
Hannan-Quinn criter.	-8.648586	**F-statistic**	**824.9170**
Durbin-Watson stat	2.265358	**Prob(F-statistic)**	**0,000000**

Based on the table above, the test results obtained from *the Common Effect Model* (CEM) regression on the ROA dependent variable showed that the F-statistic value was 824.9170. The value of df1 = 4 - 1 = 3 and df2 = 120 - 4 = 116, thus obtaining the F-table value of 2.683. In addition, the Prob(F-statistic) value is 0.000000 < 0.05, which means that the value is smaller than the significance level of 0.05.

Thus, the Prob(*F-statistic*) value of 0.000000 < 0.05 or the F-statistic value of 824.9170 > 2.683. Therefore, it can be concluded that *Intellectual Capital* (X1_IC), *Digital Transformation* (X2_DT), and *Firm Size* (C_LNSIZE) simultaneously affect *Return on Assets* (ROA).

b. Variable ROE

Table 9. F Test Results (simultaneous) ROE

Weighted Statistics			
Root MSE	0,006137	R-squared	0,946260
Mean dependent var	0,233818	Adjusted R-squared	0,944870
S.D. dependent var	0,026582	S.E. of regression	0,006241
Akaike Info Criterion	-7.282445	Sum squared resid	0,004519
Schwarz criterion	-7.189528	Log likelihood	440.9467
Hannan-Quinn criter.	-7.244711	**F-statistic**	**680.8436**
Durbin-Watson stat	2.126727	**Prob(F-statistic)**	**0,000000**

Based on the table above, the test results obtained from *the Common Effect Model* (CEM) regression on the ROE dependent variable show that the F-statistic value is 680.8436. The value of df1 = 4 - 1 = 3 and df2 = 120 - 4 = 116, thus obtaining the F-table value of 2.683. In addition, the Prob(F-statistic) value is 0.000000 < 0.05, which means that the value is smaller than the significance level of 0.05.

Thus, the Prob(F-statistic) value of 0.000000 < 0.05 or the F-statistic value of 680.8436 > 2.683. Therefore, it can be concluded that *Intellectual Capital* (X1_IC), *Digital Transformation* (X2_DT), and *Firm Size* (C_LNSIZE) simultaneously affect *the Return on Equity* (ROE).

1. Partial t-test

The t-test was carried out to test the research hypothesis regarding the influence of independent variables individually (partially) on the dependent variables. In this study, the way to conduct the t-test is based on:

If the probability value > 0.05 or the t-statistical value < the t-table is partially free of the variable has no effect on the bound variable. If the *probability value* < 0.05 or the t-statistical value > *the t-table* is partially free of charge to the bound variable.

The results of the t-test in this study:

a. Variable ROA

Table 10. Results of the (Partial) ROA t Test

T test (Partial)				
Variable	*Coefficient*	Std. *Error*	t-*Statistic*	Prob.
C	0,107545	0,001644	65.40451	0,0000
Intellectual Capital	0,001100	8.40E-05	13.08888	0,0000
Digital Transformation	0,038123	0,002219	17.17683	0,0000
LNSIZE	0,002474	5,57E-05	44.44558	0,0000

The results of the t-test obtained from *the Common Effect Model* (CEM) output on the ROA dependent variable in the table above:

1) The first hypothesis is *that intellectual capital* has an effect on *Return on Assets* (ROA). Based on the table above, it shows that the *Intellectual Capital* (X1_IC) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, to calculate the t-table, namely df = n - k = 120 - 4 = 116, so that the t-table value is obtained as 1.98063. While the *t-statistic value* shows a value of 13.08888. Because the t-statistic value is greater than the t-table value of 13.08888 > 1.98063, it can be concluded that partially the *Intellectual Capital* (X1_IC) variable has a positive and significant effect on *Return on Assets* (ROA).
2) The second hypothesis *is that digital transformation* has an effect on *Return on Assets* (ROA). Based on the table above, it shows that the *Digital Transformation* (X2_DT) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, the t-statistic value shows a value of 17.17683, so that the t-statistic value is greater than the t-table value of 17.17683 > 1.98063. It can be concluded that partially the *Digital Transformation* (X2_DT) variable has a positive and significant effect on *Return on Assets* (ROA).
3) The firm size *control variable* affects the *Return on Assets* (ROA). Based on the table above, it shows that the *Firm Size* (C_LNSIZE) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, the t-statistic value shows a value of 44.44558, so that the t-statistic value is greater than the t-table value of 44.44558 > 1.98063. It can be concluded that partially the *Firm Size* (C_LNSIZE) variable has a positive and significant effect on *Return on Assets* (ROA).

b. Variable ROE

Table 11. Results of the t-test (partial) ROE

T test (Partial)				
Variable	*Coefficient*	Std. *Error*	t-*Statistic*	Prob.
C	0,096954	0,003318	29.22393	0,0000
Intellectual Capital	0,002820	0,000170	16.63686	0,0000
Digital Transformation	0,092923	0,004478	20.75042	0,0000
LNSIZE	0,004142	0,000112	36.88843	0,0000

The results of the t-test obtained from *the Common Effect Model* (CEM) output on the ROE dependent variable in the table above:

1) The third hypothesis *is that intellectual capital* affects *Return on Equity* (ROE). Based on the table above, it shows that the *Intellectual Capital* (X1_IC) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, the t-statistic value shows a value of 16.63686, so the t-statistic value is greater than the t-table value of 16.63686 > 1.98063. It can be concluded that partially the *Intellectual Capital* (X1_IC) variable has a positive and significant effect on *Return on Equity* (ROE).
2) The fourth hypothesis *is that digital transformation* affects *Return on Equity* (ROE). Based on the table above, it shows that the *Digital Transformation* (X2_DT) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, the t-statistic value shows a value of 20.75042, so that the t-statistic value is greater than the t-table value of 20.75042 > 1.98063. It can be concluded that partially the *Digital*

Transformation (X2_DT) variable has a positive and significant effect on *Return on Equity* (ROE).

3) The control variable of *firm size* affects the *Return on Equity* (ROE). Based on the table above, it shows that the *Firm Size* (C_LNSIZE) variable has a *probability* value of 0.0000 < 0.05, which means that the *probability* value is less than 0.05. Then, the t-statistic value shows a value of 36.88843, so that the t-statistic value is greater than the t-table value of 36.88843 > 1.98063. It can be concluded that partially the *Firm Size* (C_LNSIZE) variable has a positive and significant effect on *Return on Equity* (ROE).

2. Coefficient Determination Test

1) Variable ROA

Table 12. ROA Determination Coefficient Test Results

Weighted Statistics			
Root MSE	0.003041	R-squared	0.955225
Mean dependent var	0.185893	**Adjusted R-squared**	**0.954067**
S.D. dependent var	0.014434	S.E. of regression	0.003093
Akaike Info Criterion	-8.686320	Sum squared resid	0.001110
Schwarz criterion	-8.593404	Log likelihood	525.1792
Hannan-Quinn criter.	-8.648586	F-statistic	824.9170
Durbin-Watson stat	2.265358	Prob(F-statistic)	0.000000

Based on the above results, it shows that *the adjusted r-squared* in the ROA model has a value of 0.954067 or 95.41%. This means that *intellectual capital*, *digital transformation*, and *firm size* are able to explain the variation *in Return on Assets* (ROA) of 95.41%, while the remaining 4.59% (100% - 95.41%) is influenced by other variables that are not included in this study.

2) Variable ROE

Table 13. ROE Determination Coefficient Test Results

Weighted Statistics			
Root MSE	0.006137	R-squared	0.946260
Mean dependent var	0.233818	**Adjusted R-squared**	**0.944870**
S.D. dependent var	0.026582	S.E. of regression	0.006241
Akaike Info Criterion	-7.282445	Sum squared resid	0.004519
Schwarz criterion	-7.189528	Log likelihood	440.9467
Hannan-Quinn criter.	-7.244711	F-statistic	680.8436
Durbin-Watson stat	2.126727	Prob(F-statistic)	0.000000

Based on the above results, it shows that *the adjusted r-squared* in the ROE model has a value of 0.944870 or 94.49%. This means that *intellectual capital*, *digital transformation*, and *firm size* are able to explain the variation in *Return on Equity* (ROE) of 94.49%, while the remaining 5.51% (100% - 94.49%) is influenced by other variables that are not included in this study.

The Influence of Intellectual Capital on Financial Performance

The results of the study show that intellectual capital has a positive and significant effect on the financial performance of technology sector companies in Indonesia, both calculated using Return on Assets (ROA) and Return on Equity (ROE). The probability value of the intellectual capital variable is below the significance level of 0.05 so that the first hypothesis is accepted.

The results of the panel data regression test showed that intellectual capital had a positive and significant effect on Return on Assets (ROA). The value of the intellectual capital coefficient in the ROA model is 0.001100 with a probability of 0.0000 which indicates that any increase in intellectual capital will increase the company's ability to generate profits from the total assets owned by the company. The positive coefficient value shows that technology sector companies that are able to manage human capital, structural capital, and capital employed efficiently tend to have a better level of asset use effectiveness. This condition reflects that the management of intangible assets is able to increase the productivity of the company in utilizing the resources it has to generate company profits.

The Return on Equity (ROE) value in the intellectual capital variable also showed positive and significant results with a coefficient of 0.002820 and a probability of 0.0000. This value shows that the increase in intellectual capital is able to increase the profits obtained by shareholders through increasing operational efficiency and company productivity. Technology sector companies that have good human resource management skills and organizational systems tend to be more effective in creating company added value. Liu et al., (2022) explain that intellectual capital is closely related to increasing company profitability because innovation capabilities and organizational knowledge can strengthen the efficiency of the company's capital use. The results of this study show that intellectual capital is a strategic factor that is able to improve financial performance calculated using ROA and ROE in technology sector companies in Indonesia.

Intellectual capital in this study was measured using the Value Added Intellectual Coefficient (VAIC) method which consists of human capital efficiency, structural capital efficiency, and capital employed efficiency. The measurement is able to illustrate the extent to which the company manages knowledge-based resources to create a competitive advantage. S. Cabrilo et al., (2024) explained that intellectual capital is an intangible asset derived from knowledge, labor capabilities, business networks, and internal systems that can improve the company's operational efficiency and innovation. Research by Liu et al., (2022) also proves that intellectual capital has a positive influence on financial performance calculated using ROA and ROE in technology sector companies because human capital and physical capital are able to create efficiency in company value. The findings of this study strengthen the view that technology sector companies need optimal intellectual capital management in order to be able to survive the increasingly competitive digital industry competition.

Resource-based theory explains that companies that have unique, difficult to replicate, and high-value resources will have an easier competitive advantage than other companies. Intellectual capital is one of the strategic resources because technology sector companies not only depend on physical assets, but also on the ability to innovate and the quality of human resources. Sirait, (2024) explained that human capital, structural capital, and capital employed are important assets that are able to create the sustainability of the company's business in the

long term. Research by Yin and Id, (2025) found that intellectual capital has a significant positive effect on the company's financial performance because it is able to increase operational efficiency and company productivity. The results of this study show that technology sector companies in Indonesia have utilized intellectual capital as the main instrument in increasing company profitability and maintaining business competitiveness in the digital era.

The company's ability to manage intellectual capital can be seen from the increase in employee productivity, the quality of internal systems, and the company's ability to create technology-based business innovations. Good human capital management will increase the skills and creativity of the workforce so that companies are able to produce more competitive products and services. Strong structural capital also supports the effectiveness of business processes through the use of more efficient information systems and technology. Dancakov and Glova's research, (2024) explains that the integration between human resources, physical capital, and organizational systems is an important factor in increasing company profitability. The results of this study show that technology companies in Indonesia that have high intellectual capital tend to be able to generate better ROA and ROE than companies with low intellectual capital management.

The Influence of Digital Transformation on Financial Performance

The results of the study show that digital transformation has a positive and significant effect on the financial performance of technology sector companies in Indonesia, both calculated through Return on Assets (ROA) and Return on Equity (ROE). The probability value of the digital transformation variable is below the significance level of 0.05 so that the second hypothesis is accepted. In the ROE model, the value of the regression coefficient of 0.092923 with a probability of 0.0000 indicates that the increase in digital transformation is able to significantly increase the company's Return on Equity (ROE). These findings show that companies that are able to adopt digital technology optimally have better ability to improve operational efficiency and company profitability. The use of digital technology helps companies speed up business processes, improve service quality, and increase organizational productivity. This condition is proof that digital transformation has become an important factor in supporting the growth of technology sector companies in Indonesia.

The results of the study show that digital transformation has a positive and significant effect on Return on Assets (ROA). The value of the digital transformation coefficient in the ROA model is 0.038123 with a probability of 0.0000. This value shows that the increase in digital transformation is able to increase the effectiveness of companies in utilizing company assets to generate profits. The use of digital technology helps companies improve the efficiency of operational processes, accelerate business activities, and optimize the utilization of company resources. This condition shows that digital transformation has an important contribution in increasing the productivity of technology sector companies' assets in Indonesia.

Teng and Wu, (2022) explain that digital transformation can increase a company's profitability through the integration of digital technology and the company's business strategy. The results of this study show that digital transformation is an important factor in increasing the ROA and ROE of technology sector companies in Indonesia.

Digital transformation in this study is measured using the ratio of intangible assets to total company assets. The measurement reflects the level of use of digital technology, information system innovation, and the development of digital assets in supporting the

company's operational activities. Plekhanov et al., (2023) explain that digital transformation is a fundamental change in business models and organizational structures through the use of digital technology to increase company efficiency and transparency. Research by Teng and Wu, (2022) shows that the success of digital transformation is influenced by the company's ability to integrate digital technology with the company's workforce capabilities and business strategy. The results of this study prove that technology sector companies in Indonesia are increasingly actively developing digital systems to increase business competitiveness in the digital economy era.

The implementation of digital transformation has a positive impact on the company's ability to optimize business processes and decision-making. The use of digital-based technology allows companies to obtain data quickly and accurately so that business decisions can be made more effectively. Digital innovation also helps companies reduce operational costs through system automation and improved work efficiency. Yin and Id, (2025) explained that digital transformation is able to improve the quality of company management through the application of digital technology that is integrated with the company's operational activities. The research also shows that companies that successfully implement digital transformation have a higher ability to create added value and increase company profitability.

Digital transformation in technology sector companies is not only related to the use of modern software or technology, but also related to changes in organizational culture and corporate business strategy. Companies that successfully digitize usually have a higher ability to adapt to market changes and technological developments. The use of big data, cloud computing, artificial intelligence, and other digital systems helps companies improve the quality of services and expand the company's business market. Plekhanov et al., (2023) explain that digital transformation is able to create operational efficiencies while increasing the company's business innovation. The results of this study show that digital transformation is an important factor that helps technology sector companies in Indonesia maintain business growth and improve the company's financial performance in a sustainable manner.

Firm Size as a Control Variable

Firm size as a control variable shows a positive and significant influence on the company's financial performance which is calculated using ROA and ROE. In the ROA model, the firm size has a coefficient value of 0.002474 with a probability of 0.0000. These values indicate that companies with larger asset sizes tend to have a better ability to utilize the company's total assets to generate profits. Large companies typically have wider access to funding, higher technology investment capabilities, and more stable operational systems than companies with smaller asset sizes. This condition helps companies increase the effectiveness of the use of company assets in generating profits.

The value of the firm size coefficient in the ROE model is 0.004142 with a probability of 0.0000 which indicates a positive and significant influence on the company's Return on Equity (ROE). This value shows that companies with large asset sizes have better ability to increase profits for shareholders. Large companies tend to find it easier to expand their business, invest in technology, and develop innovations so that they can increase the company's profitability in a sustainable manner. Liu et al., (2022) explained that company size affects the company's ability to improve operational efficiency and company competitiveness in technology-based industries. The results of this study show that firm size is a supporting factor

that helps increase the ROA and ROE of technology sector companies in Indonesia.

Firm size as a control variable also shows a positive influence on financial performance calculated by ROA and ROE in technology sector companies. With larger assets, it has a stronger capacity for digital investment, system development, innovation, and operational efficiency. Companies with larger asset sizes have higher capabilities in making technology investments, innovation development, and managing corporate resources. Liu et al., (2022) explain that company size is positively related to the company's ability to increase profitability and business operational effectiveness. Large companies tend to have wider access to funding so that it is easier to carry out technology development and digital transformation. The results of this study show that technology sector companies with large asset sizes have a higher chance of increasing ROA and ROE than companies with smaller asset capacity.

Adjusted R-Square (Adjusted R2)

The results of the determination coefficient test showed that the Adjusted R-Square value in the ROA model was 0.954067 or 95.41%, while in the ROE model it was 0.944870 or 94.49%. This value shows that the variables of intellectual capital, digital transformation, and firm size together are able to explain the variation in Return on Assets (ROA) of 95.41% and the variation of Return on Equity (ROE) of 94.49%, while the remaining 4.59% in the ROA model and 5.51% in the ROE model are explained by other variables that are not included in this study model.

The very high Adjusted R-Square value in both models indicates that the combination of intellectual capital management, the use of digital technology, and company size makes a strong and consistent contribution to the financial performance of technology sector companies listed on the Indonesia Stock Exchange (IDX). This high determination value is also consistent with the significant F-test results in both models, which suggests that all three variables are simultaneously feasible to predict a company's ROA and ROE.

However, the very high value of determination needs to be interpreted proportionally, considering that the research sample comes from one industry sector that is relatively homogeneous in terms of asset structure and business model, so that variations between companies are easier to explain by the variables in the model. Thus, these results confirm that intellectual capital and digital transformation, together with company size, are the main factors that are able to explain the financial performance calculated by ROA and ROE in technology sector companies in Indonesia, as well as the basis for companies to continue to strengthen intangible asset management and digital investments to increase profitability in a sustainable manner.

CONCLUSION

This study examined the effects of intellectual capital and digital transformation on the financial performance of technology-sector companies in Indonesia during the 2022–2025 period, with financial performance measured using return on assets (ROA) and return on equity (ROE). Intellectual capital was measured using the Value Added Intellectual Coefficient (VAIC™), while digital transformation was proxied by the ratio of intangible assets to total assets. Panel data regression analysis was conducted using EViews on a sample of technology-sector companies listed on the Indonesia Stock Exchange (IDX). The results indicated that the independent variables had statistically significant effects on financial performance. Intellectual

capital had a positive and statistically significant effect on both ROA and ROE, indicating that the efficient management of human capital, structural capital, and capital employed contributed to greater operational efficiency and profitability, thereby supporting the Resource-Based View (RBV). Digital transformation also had a positive and statistically significant effect on financial performance, suggesting that greater investment in intangible resources associated with digitalization contributed to improved efficiency, value creation, and profitability. In addition, firm size, included as a control variable, had a positive and statistically significant effect on financial performance, indicating that larger technology-sector companies tended to achieve stronger financial performance during the study period.

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