

The Influence of Intellectual Capital, Technology, and Growth Opportunity on Company Value with Good Corporate Governance as a Moderating Variable (A Study of Technology & Telecommunications Sector Companies Listed on the IDX for the 2021-2024 Period)

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DOI : <https://doi.org/10.61796/ijeirc.v3i3.506>



Sections Info

Article history:

Submitted: December 26, 2025
Final Revised: January 17, 2026
Accepted: February 12, 2026
Published: March 16, 2026

Keywords:

Intellectual capital
Technology
Growth opportunity
Company value
Good corporate governance

ABSTRACT

Objective: This study aims to analyze and obtain empirical evidence regarding the influence of intellectual capital, technology, and growth opportunities on firm value in technology sector companies listed on the Indonesia Stock Exchange. Furthermore, this study also aims to examine the role of Good Corporate Governance as a moderating variable in the relationship between intellectual capital, technology, and growth opportunities on firm value. **Method:** This is a quantitative study with an explanatory approach. The population in this study was all 40 technology companies listed on the IDX during the 2021–2024 period. The data analysis technique used in this study was Structural Equation Modeling based on Partial Least Squares (SEM-PLS). **Results:** The results show that all independent variables, namely intellectual capital, technology, and growth opportunities, have a positive and significant influence on firm value. Among these three variables, growth opportunities are proven to have the most dominant influence in increasing firm value, indicating that growth prospects are a primary consideration for investors in assessing companies. Furthermore, Good Corporate Governance not only has a direct influence on firm value but also acts as a moderating variable that strengthens the relationship between intellectual capital, technology, and growth opportunities on firm value. This confirms that good corporate governance can optimize the use of a company's strategic resources, thereby creating greater value. **Novelty:** Thus, this study strengthens the integration of theories such as Resource-Based Theory and Knowledge-Based View in explaining the determinants of firm value.

INTRODUCTION

The development of a knowledge-based economy encourages companies to no longer rely solely on physical assets, but rather on the management of intangible assets such as intellectual capital and technological capabilities. This phenomenon is highly relevant for technology companies that make innovation, human resources, and organizational systems the main drivers of value creation. In Indonesia, the acceleration of digital transformation post-COVID-19 pandemic has driven rapid growth in the Technology and Telecommunications sector, marked by the launch of the IDXTECHNO Index by the Indonesia Stock Exchange (IDX) as an indicator of the performance of technology company stocks [1]. However, the market performance of technology companies included in IDXTECHNO during the 2021–2024 period showed significant fluctuations. At the beginning of its launch, IDXTECHNO reflected investor optimism regarding the growth prospects of technology-based companies, in line with the increasing digital adoption in the e-commerce, fintech, edutech, and healthtech sectors.

However, in the following period, this index experienced significant pressure due to market corrections, a decline in technology stock performance, and increasing global and domestic uncertainty. This condition shows that the high potential for growth and technological innovation is not automatically followed by an increase in the company's value in the eyes of investors [2].

The value of a company is a reflection of the market's perception of the company's ability to create sustainable value in the future. In the context of technology companies, fluctuations in stock prices and market value indicate investor uncertainty in assessing the quality of intellectual capital management, the effectiveness of technology utilization, and the realization of growth opportunities possessed by the company. Companies with superior human resources and strong organizational systems should be able to generate sustainable innovations and increase market confidence. However, without optimal management, intellectual capital has the potential to not contribute maximally to the company's value [3]. Moreover, the high technological intensity in technology companies demands significant investments with considerable risks. The rapid pace of technological change, intense competition, and uncertainty in monetizing innovations cause investors to be more cautious in assessing the prospects of technology companies. This is reflected in the volatility of technology company stocks on the IDX, even tho these companies have high growth opportunities. Thus, a significant growth opportunity does not always translate into an increase in company value if it is not accompanied by effective management and oversight strategies [4].

In such volatile market conditions, the implementation of Good Corporate Governance (GCG) becomes a crucial factor. GCG functions as a mechanism to reduce agency conflicts, enhance transparency, and strengthen management accountability in managing intellectual capital, technology investments, and strategic decisions related to company growth. The proper implementation of GCG is expected to improve the quality of information received by investors and strengthen market confidence, thereby moderating the influence of intellectual capital, technology, and growth opportunities on company value [5]. Theoretically, this research enriches the development of Resource-Based Theory and Knowledge-Based View by positioning Good Corporate Governance (GCG) as a strategic mechanism in optimizing the utilization of knowledge-based and technological resources to create company value. This approach provides a new perspective in the literature on how corporate governance plays a role in converting intangible assets into market value thru the effective management of resources and knowledge [6]. Although research on firm value has been extensively conducted, previous studies have shown inconsistent findings and still leave several research gaps, particularly in the context of technology companies. The research examines the relationship between intellectual capital and company performance and shows that intellectual capital has a positive and significant impact on both the value and performance of the company. These findings underscore the importance of the role of intangible assets in the process of value creation for the company. However, the research

has not yet considered Good Corporate Governance (GCG) as a moderating variable in its analysis model. [7]. Intellectual capital has been proven to play an important role in the process of value creation for companies. However, this study has not yet involved moderating variables in its analysis model and does not specifically examine companies in the technology sector [8]. Intellectual capital was analyzed in the banking sector in Turkey and was found to have a positive impact on financial performance. Although conducted in the context of a developing country, this study has not focused its analysis on the technology sector and has not examined company value as a research variable [9]. Intellectual capital has been proven to have a positive impact on company value. This study recommends the addition of moderating variables and the expansion of industry sector coverage, thereby providing opportunities for further research to examine technology sector companies with Good Corporate Governance (GCG) as the moderating variable. Intellectual capital has been proven to have a significant impact on the value of the company. However, this study has not yet examined the role of technology and growth opportunity, nor has it included Good Corporate Governance (GCG) as a moderating variable in the research model [10]. Disclosure of intellectual capital has been proven to have a positive impact on company value. However, this study has not yet considered the role of technology or corporate governance in its analysis [11]. Intellectual capital on firm value was analyzed with investment opportunity set as a moderating variable in the banking sector. The results show that the investment opportunity set is capable of moderating that relationship. However, this study has not included technology variables and does not specifically focus on technology sector companies [12].

Several previous studies have also analyzed that intellectual capital has not been proven to affect company value, while Good Corporate Governance (GCG) also does not play a role in moderating that relationship. Intellectual capital has been proven to have a negative impact on company value, while corporate governance shows a positive but insignificant effect. Nevertheless, this study has not included technology and growth opportunity variables, nor has it used Good Corporate Governance (GCG) as a moderating variable [13]. These findings indicate inconsistencies in empirical results and reinforce the urgency of conducting further research in different sectors, particularly in technology sector companies [14]. Growth opportunity has been proven to have a positive effect on company value. This study recommends the addition of moderating variables and the expansion of the industrial sector scope, thereby providing opportunities for further research to examine technology sector companies with Good Corporate Governance (GCG) as a moderating variable. Growth opportunity has been proven to have a positive impact on company value, both directly and thru profitability as an intervening variable. However, this study has not yet included intellectual capital, technology, and Good Corporate Governance (GCG) in its research model [15].

Good Corporate Governance has been proven to have a positive impact on company performance and company value. These findings underscore the importance of implementing corporate governance in enhancing company performance and value.

However, the study has not yet included intellectual capital or technology as variables in its research model [16]. Digital transformation has proven to have a positive impact on company value thru increased efficiency and technological innovation in companies in China. However, despite being relevant to technology variables, this study has not included Good Corporate Governance (GCG) as a moderating variable and has not examined the role of growth opportunity [17]. The influence of Good Corporate Governance (GCG) on company value was analyzed with the investment opportunity set as a moderating variable in the banking sector. The results showed that the investment opportunity set was able to moderate that relationship. However, this study has not included technology variables and does not specifically focus on technology sector companies. Good Corporate Governance (GCG) has been proven to be able to moderate the influence of intellectual capital on company value, although the direct influence of intellectual capital and GCG shows a negative direction. However, this study is still limited to the non-technology sector and has not yet included the variables of growth opportunity and technology in its research model [18].

This research has a novelty that clearly distinguishes it from previous studies, both conceptually, empirically, and contextually. The first novelty is that this research is one of the studies that integrates intellectual capital, technology, and growth opportunity simultaneously in one empirical model to explain company value. Previous research generally examined these variables partially or separately, thus failing to capture the comprehensive interconnections among value-creating factors in technology companies. The integration of these three variables provides a new perspective on the mechanisms of value creation in companies within a knowledge-based and digital economy. The second novelty is the Role of Good Corporate Governance as a Moderating Variable. Unlike most previous studies that place Good Corporate Governance (GCG) as an independent variable or only examine its direct impact on company value, this research positions GCG as a moderating variable. This novelty allows for empirical testing of the extent to which GCG can strengthen or weaken the influence of intellectual capital, technology, and growth opportunity on company value, particularly in conditions of market volatility and high agency risk in technology companies. The third novelty is the Context of Sector and Research Index. This research specifically focuses on technology companies listed in IDXTECHNO on the Indonesia Stock Exchange, which until now have been very limitedly studied in depth. Unlike previous research that has largely focused on the manufacturing, banking, or other traditional sectors, this study places technology companies as the main object of study, thereby providing new empirical contributions relevant to the dynamics of the digital industry in Indonesia. The fourth novelty is the Post-Pandemic Research Period (2021-2024). This study uses the observation period of 2021-2024, which is the post-COVID-19 pandemic period marked by the acceleration of digital transformation, the launch of IDXTECHNO, and fluctuations in the stock prices of technology companies. Previous research generally used periods before the pandemic or the early stages of digital transformation, so this

study provides updated empirical evidence in the context of the Indonesian capital market.

Although the phenomenon of stock fluctuations in technology companies on the IDX, particularly those included in IDXTECHNO, shows interesting dynamics, empirical research that comprehensively examines the influence of intellectual capital, technology, and growth opportunity on company value with Good Corporate Governance as a moderating variable is still relatively limited, especially in the period 2021-2024. Therefore, this research is important to provide an empirical understanding of the factors influencing the value of technology companies in Indonesia in facing market volatility and economic uncertainty. The selection of Technology & Telecommunications companies as the research sample is based on the industry's characteristics, which heavily rely on innovation, technological mastery, and the utilization of knowledge-based resources. This industry is one of the sectors experiencing the fastest growth in line with the development of the digital economy and the increasing demand for information and communication technology-based services. Companies in this sector generally have a high level of intellectual capital, significant technology investment intensity, and broader growth opportunities compared to traditional industrial sectors. These conditions make the Technology & Telecommunications sector a relevant context for testing how the management of intellectual capital, technology, and growth opportunities can affect the value of the Company [19]. In addition, the Technology & Telecommunications sector also has relatively high business uncertainty and market volatility characteristics, especially related to rapid technological changes, competitive dynamics, and the continuously evolving digital business models. This causes investors to pay close attention to strategic factors such as innovation capability, technology utilization, and the quality of corporate governance when assessing the future prospects of the company. Therefore, the use of a sample of Technology & Telecommunications companies is expected to provide a more relevant empirical picture of the relationship between intellectual capital, technology, growth opportunity, and company value, particularly in the context of the rapidly growing digital industry in Indonesia. This research aims to analyze and obtain empirical evidence regarding the influence of intellectual capital, technology, and growth opportunity on company value in technology sector companies listed on the Indonesia Stock Exchange. Additionally, this research also aims to examine the role of Good Corporate Governance as a moderating variable in the relationship between intellectual capital, technology, and growth opportunity on company value.

Theoretical Study

Resource-Based Theory explains that a company's competitive advantage comes from its ability to manage resources that are valuable, rare, inimitable, and non-substitutable (VRIN). These resources not only include physical assets but also intangible assets such as intellectual capital, technology, and organizational capabilities [20]. In the context of this research, intellectual capital and technology are strategic resources that can create value for the company if managed optimally. Companies that can effectively

integrate these resources will have a sustainable competitive advantage and will impact the increase in company value. In addition, growth opportunity can be viewed as the potential utilization of resources in the future. However, without effective management, that potential will not contribute maximally to the company's value. Therefore, the existence of Good Corporate Governance (GCG) becomes important as a mechanism that ensures the optimal utilization of resources in line with the company's objectives [21].

Knowledge-Based View is an extension of RBT that emphasizes that knowledge is the most important strategic resource within an organization [22]. In this perspective, the company is viewed as an entity that manages, creates, and distributes knowledge to generate value. In this research, intellectual capital represents a concrete form of knowledge-based resources, which consists of: Human capital (the knowledge and skills of employees). Structural capital (the systems, processes, and organizational databases). Relational capital (relationships with stakeholders). Technology acts as an enabler in the knowledge management process, such as the storage, distribution, and utilization of information. Thus, the combination of intellectual capital and technology reflects the company's ability to create innovation and improve efficiency [23]. In the KBT framework, companies that can effectively manage knowledge will be better able to leverage growth opportunities and increase the company's value. However, this effectiveness is greatly influenced by the quality of corporate governance (GCG) in directing the strategic use of knowledge [24].

Intellectual capital is an intangible asset that reflects the company's ability to create value thru knowledge and innovation [25]. Intellectual capital generally consists of: Human Capital, which includes the competencies, skills, and creativity of human resources. Structural Capital, which encompasses systems, processes, organizational culture, and supporting technology. Relational Capital, which relates to the company's relationships with customers, partners, and other stakeholders. In technology companies, intellectual capital becomes the main source of competitive advantage. Effective management of intellectual capital is expected to enhance performance and investor confidence, thereby positively impacting the company's value.

Technology in this research is understood as the company's ability to utilize information technology and digital innovation to support operations, decision-making, and the development of products or services. Technology enables technology companies to increase efficiency, accelerate innovation, and respond to market changes more adaptively. However, technology investments also carry the risk of uncertain outcomes and high costs. Therefore, the impact of technology on company value highly depends on how that technology is managed and integrated with other resources, particularly intellectual capital and corporate governance systems [26].

Growth opportunity reflects the company's potential to grow and develop in the future, whether thru market expansion, product development, or asset enhancement. In financial theory, growth opportunity is often associated with investor expectations regarding potential future profits. In technology companies, growth opportunity is

generally high due to the dynamic and innovative characteristics of the industry. However, significant growth opportunities also increase agency risk and realization uncertainty. Therefore, growth opportunities do not always have a positive impact on the company's value if not managed effectively [27].

Good Corporate Governance is a system that regulates and controls the relationships between shareholders, management, and other stakeholders to achieve the company's objectives. The main principles of GCG include transparency, accountability, responsibility, independence, and fairness. In this study, GCG is positioned as a moderating variable that plays a role in strengthening or weakening the influence of intellectual capital, technology, and growth opportunity on company value. Good GCG is believed to ensure that the utilization of knowledge-based resources and growth opportunities is directed toward the interests of shareholders, thereby increasing company value.

The value of the company reflects the market's perception of the company's performance and future prospects. The value of a company is often associated with the company's main objective, which is to maximize shareholder wealth. In the capital market, the value of a company is reflected in its stock price and market indicators such as Tobin's Q or Price to Book Value (PBV). In technology companies, the value of the company is greatly influenced by investor expectations regarding the company's ability to manage innovation, technology, and growth opportunities. Therefore, the value of the company is not only determined by historical financial performance but also by knowledge-based strategic factors and governance [28].

Relationship Between Variables

1. The Influence of Intellectual Capital on the Company

Value Intellectual capital is an intangible asset that reflects the company's ability to create value through knowledge, human resource skills, organizational systems, and relationships with external parties [29]. Based on the perspective of Resource-Based Theory, intellectual capital is a strategic resource that possesses the characteristics of being valuable, rare, inimitable, and non-substitutable (VRIN). This asset reflects the company's ability to create sustainable competitive advantages through the utilization of knowledge, skills, and organizational systems [30]. In line with the Knowledge-Based View, knowledge is regarded as the primary resource in the value creation process. Intellectual capital, which consists of human capital, structural capital, and relational capital, enables companies to generate innovation, improve efficiency, and strengthen their competitive position in the market. Companies that are able to manage intellectual capital effectively will have a greater ability to create added value, thereby increasing investor confidence and the company's value. Therefore, the higher the level of intellectual capital, the higher the value of the company. [31]. Intellectual capital has been proven to significantly increase the value of the company and its performance. Similar findings also affirm that the management of intellectual capital serves as a positive signal for investors in assessing the company's prospects. In Indonesia, intellectual capital has

been proven to have a positive and significant impact on company value. However, several studies show different results [32], finding that intellectual capital does not influence or even negatively affects the value of the company. This inconsistency indicates that the influence of intellectual capital on firm value is affected by the industry context and the company's management mechanisms.

H1: Intellectual capital has a positive effect on company value

2. The Influence of Technology on Company Value

Technology is a key element in technology companies that plays a role in enhancing efficiency, innovation, and competitiveness. From the perspective of Resource-Based Theory, technology is part of strategic resources that can enhance operational efficiency and the competitive advantage of the company. Technology that is well-integrated into business processes will strengthen the company's ability to create value [33]. Meanwhile, the Knowledge-Based View emphasizes that technology serves as an enabler in knowledge management, including in the processes of accumulation, distribution, and utilization of information. Technology enables companies to accelerate innovation and improve the quality of decision-making. However, the contribution of technology to the value of the company highly depends on the company's ability to integrate it with other resources, particularly intellectual capital. Therefore, the effective utilization of technology will have a positive impact on the company's value. Digital transformation has proven to have a positive and significant impact on company value thru increased efficiency in resource allocation and technological innovation. In addition, technological innovation also plays an important role in improving the company's performance. In the context of Indonesia, information technology and corporate governance mechanisms are known to influence company value, although the impact of technology spending is not always significant [34]. The difference in results indicates that the impact of technology on company value is not direct, but rather highly dependent on the effectiveness of management and corporate governance.

H2: Technology has a positive impact on company value

3. The Influence of Growth Opportunity on Company Value

Growth opportunity reflects a company's potential to grow in the future and is often used by investors as an indicator of long-term profit potential. In financial theory, companies with high growth opportunities are perceived to have a higher company value [35]. In the framework of Resource-Based Theory, growth opportunity reflects the potential of a company to develop and utilize strategic resources in the future. Growth opportunities indicate the company's ability to expand capacity, increase investments, and create added value [36]. In line with the Knowledge-Based View, growth opportunities are also related to the company's ability to develop and exploit knowledge to create innovations and new opportunities. Companies with strong knowledge management capabilities will be better able to convert growth opportunities into performance and company value. Thus, the greater the growth opportunities a company has, the greater the potential for an increase in the company's value, especially if

supported by effective resource management capabilities [37]. Growth opportunity has been proven to have a positive and significant impact on company value and reflects good growth prospects in the future [38]. However, other empirical findings show different results, where growth opportunity does not always impact the increase in company value [39]. This difference in results indicates that high growth opportunities can also be perceived as a source of risk if not managed effectively. However, other studies have found different results.

H3: growth opportunity has a positive effect on company value

4. The Role of Good Corporate Governance in Strengthening the Influence of Intellectual Capital on Company Value

Based on the Resource-Based Theory, intellectual capital will only provide a competitive advantage if managed effectively. In this case, Good Corporate Governance (GCG) acts as a mechanism that ensures the optimal utilization of strategic resources in accordance with the company's objectives. From the perspective of the Knowledge-Based View, good corporate governance supports a more structured, transparent, and efficient knowledge management process. This allows the company to maximize the potential of intellectual capital in creating value [40]. Thus, GCG plays a role in strengthening the relationship between intellectual capital and company value through the enhancement of knowledge-based resource management effectiveness. Good Corporate Governance (GCG) has been proven to be able to moderate the influence of intellectual capital on company value, although the direct influence of intellectual capital and GCG shows a negative direction [41].

H4: Good Corporate Governance Strengthens the Positive Influence of Intellectual Capital on Company Value

5. The Role of Good Corporate Governance in Strengthening the Influence of Technology on Company Value

Within the framework of Resource-Based Theory, technology as a strategic resource requires proper management to provide a competitive advantage. Without good governance, technology investments have the potential to be suboptimal or even cause inefficiencies. In line with the Knowledge-Based View, GCG plays a role in ensuring that technology is used to effectively support the process of knowledge creation and distribution. Good governance enables the integration of technology with the company's strategy, thereby increasing the value generated. Therefore, GCG strengthens the influence of technology on company value by ensuring its utilization is efficient and strategic [42]. Technology investments carry high risks and a significant level of uncertainty, thus requiring effective oversight and control. In this context, GCG plays a role in ensuring that technology investments are made efficiently and transparently. The corporate governance mechanism, particularly the role of the board of commissioners, has been proven to have a positive impact on company value in the context of information technology utilization. However, research specifically examining GCG as a moderating

variable in the relationship between technology and company value is still very limited, thus opening up new avenues for this research.

H5: Good Corporate Governance Strengthens the Positive Impact of Technology on Company Value

6. The Role of Good Corporate Governance Strengthens the Influence of Growth Opportunity on Company Value

High growth opportunities can increase the potential for agency conflict because management has the discretion to determine the direction of investment. In the perspective of Resource-Based Theory, growth opportunity reflects the potential utilization of resources in the future. However, that potential requires proper management in order to be converted into company value [43]. Meanwhile, the Knowledge-Based View emphasizes that the utilization of growth opportunities highly depends on the company's ability to manage knowledge and make strategic decisions. GCG plays a role in directing the process to be more effective and controlled. Thus, the presence of GCG strengthens the relationship between growth opportunity and company value by ensuring that growth opportunities are utilized optimally and oriented toward value creation. The investment opportunity set has been proven to be able to moderate the influence of Good Corporate Governance (GCG) and intellectual capital on company value. Growth opportunity has been proven to affect company value thru certain mechanisms [44]. However, research that directly examines GCG as a moderating variable between growth opportunity and company value, particularly in technology companies, is still very limited.

H6: Good Corporate Governance Strengthens the Positive Impact of Growth Opportunity on Firm Value

RESEARCH METHOD

1. Type and Research Approach

This research is a quantitative study with an explanatory approach, aimed at examining the influence of intellectual capital, technology, and growth opportunity on company value with Good Corporate Governance as a moderating variable. This approach is used to explain the causal relationship between variables based on empirical data from technology companies listed on the Indonesia Stock Exchange (BEI) [45].

2. Research Object and Period

The research object is companies in the Technology and Telecommunications sector listed on the Indonesia Stock Exchange (IDX) and included in the IDXTECHNO index. The research period covers the years 2021–2024, which is the post-pandemic period marked by the acceleration of digital transformation and fluctuations in the stock values of technology companies.

3. Population and Sample of the Research

a. Population

The population in this study consists of all technology companies listed on the IDX during the period 2021–2024, totaling 40 companies.

b. Sample

The sampling technique used is purposive sampling, with the following criteria:

- 1) The company is included in the Technology and Telecommunications sector and/or is part of the IDXTECHNO index during the period 2021–2024.
- 2) The company publishes a complete annual report and/or sustainability report during the research period.
- 3) The company has complete financial data for measuring company value, intellectual capital, technology, growth opportunity, and Good Corporate Governance.
- 4) The company does not experience delisting during the research period.

Table 1. Purposive Sampling.

No.	Sample Selection Criteria	Description
1	Companies included in the Technology/Telecommunications sector and listed in IDXTECHNO during the 2021–2024 period	40 companies
2	Did not publish complete annual reports and/or sustainability reports during the research period	25 companies
3	Did not have complete financial data for all research variables	0 companies
4	Experienced delisting during the research period	0 companies
Total initial companies		40 companies
Total number of companies included in the final sample		15 companies
Data processed by the researcher: 15 × 4 (years) = 60		60 data

4. Type and Source of Data

This research uses secondary data obtained from annual reports and financial statements of technology companies, corporate governance reports, and the official website of the Indonesia Stock Exchange and the official websites of each company [46].

5. Operational Definitions and Variable Measurement

Table 2. Operational Definitions and Measurement of Research Variables.

Variable	Operational Definition	Measurement/Formula	Description
Firm Value (Y)	Firm value is the market's perception of the company's performance and prospects.	$PBV = \text{Share Price} / \text{BVPS}$ $BVPS = \text{Total Equity} / \text{Number of Outstanding Shares}$	PBV is used to assess whether shares are expensive or cheap. $PBV < 1$ is considered cheap, while $PBV > 1$ is

Intellectual Capital (X1)	Intellectual capital is measured using the Value Added Intellectual Coefficient (VAIC™) method. Calculating Value Added (VA)	$VAIC = VACA + VAHU + STVA$ $VA = OUT - IN$	considered expensive [47]. VAIC measures value creation efficiency based on physical, human, and structural capital. OUT = Total Revenue; IN = Operating expenses excluding employee salaries and benefits.
	Calculating Structural Capital (SC) Value Added Capital Employed (VACA)	$SC = VA - HU$ $VACA = VA / CE$	HU = Human Capital (employee salaries and wages). Measures the contribution of physical capital to the organization's value added.
	Value Added Human Capital (VAHU)	$VAHU = VA / HU$	Measures the contribution of labor investment to the organization's value added.
	Structural Capital Value Added (STVA)	$STVA = SC / VA$	Measures the contribution of structural capital to value creation.
Technology (X2)	Technology is measured using the company's technology intensity.	$IT \text{ Expenditure} / \text{Total Assets or R\&D Expenditure} / \text{Total Sales}$	Adjusted to the availability of data from technology companies listed on the IDX.
Growth Opportunity (X3)	Growth opportunity reflects the company's future growth opportunities.	$MBVA = MVE / BVE$	MBVA is used to measure the market's assessment of the company's growth.
	Market Value of Equity (MVE)	$MVE = \text{Share Price} \times \text{Number of Outstanding Shares}$	Describes the company's market value.

	Book Value of Equity (BVE)	BVE = Total Assets – Total Liabilities	Describes the company's book value.
Good Corporate Governance (Z)	Good Corporate Governance is proxied by the number of members of the board of commissioners.	GCG = Number of Board Commissioners	A larger number of commissioners is expected to improve the effectiveness of company monitoring.

6. Data Analysis Techniques

The data analysis technique used in this research is Partial Least Squares-based Structural Equation Modeling (SEM-PLS) with the assistance of Smart PLS software [47]. SEM-PLS was chosen because it has several advantages that align with the characteristics of this research. First, SEM-PLS is capable of testing simultaneous relationships between latent variables, both direct effects and moderation effects, within a comprehensive structural model. Second, this method does not require normally distributed data, making it suitable for financial data of companies that tend to be non-normally distributed. Third, SEM-PLS is appropriate for complex research models involving moderation variables and a relatively limited sample size, as is characteristic of companies in the Technology and Telecommunications sector in Indonesia. Data analysis is conducted through several stages, namely the measurement model testing (outer model), structural model testing (inner model), and hypothesis testing [48].

Data Analysis Stages

1. Measurement Model Test (Outer Model)

The measurement model test aims to assess the validity and reliability of the constructs used in the research. The testing stages include:

- Convergent Validity Test.** Convergent validity is assessed based on the loading factor value of each indicator toward its construct. An indicator is declared valid if it has a loading factor value ≥ 0.70 .
- Discriminant Validity Test.** Discriminant validity is conducted to ensure that a construct has uniqueness and is truly different from other constructs. This test is conducted by comparing the cross-loading values or using the Fornell-Larcker criterion.
- Construct Reliability Test.** Construct reliability is assessed using Composite Reliability and Cronbach's Alpha. A construct is considered reliable if each of these values is ≥ 0.70 , indicating the internal consistency of the indicators in measuring the latent construct.

2. Structural Model Test (Inner Model)

The structural model test aims to evaluate the causal relationships between the latent variables that have been constructed in the research model. The testing is conducted through the following indicators:

- Coefficient of Determination Test (R-square/R²). The R² value is used to measure the ability of independent variables to explain the variation in the dependent variable, which is the company value.
- Path Coefficient Test. The path coefficient test is conducted to determine the direction and strength of the direct influence between intellectual capital, technology, and growth opportunity on the company value.
- Good Corporate Governance Moderation Test. The moderation test is conducted to determine the role of Good Corporate Governance, proxied by the number of board of commissioners, in strengthening or weakening the influence of intellectual capital, technology, and growth opportunity on the company value through the formation of interaction effects in the SEM-PLS model.

3. Hypothesis Testing

Hypothesis testing is conducted using the bootstrapping method on Smart PLS to obtain the t-statistic and p-value. The decision criteria for hypothesis testing are as follows: The hypothesis is accepted if the t-statistic > 1.96 and the p-value < 0.05. The results of this testing are used to determine the significance of direct influence and moderating influence between variables in the research model [49].

RESULTS AND DISCUSSION

Results

Data Analysis Results

1. Measurement Model Evaluation (Outer Model)

Table 3. Factor loadings.

	Moderating Effect 1	Moderating Effect 2	Moderating Effect 3	GCG	GO	IC	FV	TNG
GO × GCG			0.908					
IC × GCG	0.959							
TNG × GCG		0.831						
X1						0.897		
X2								0.710
X3					0.785			
Y							0.813	
Z				0.872				

Based on the results of the convergent validity test on the research model, all variables show factor loading values above the minimum threshold of 0.70; they can be declared valid and capable of representing the measured construct. In the moderation variables, the interaction between Growth Opportunity and Good Corporate Governance has a loading factor value of 0.908. The interaction between Intellectual Capital and Good Corporate Governance shows the highest loading factor value of 0.959, while the interaction between Technology and Good Corporate Governance has a value of 0.831. The results indicate that all moderation constructs have met the criteria for convergent validity. Next, for the independent variables, the loading factor for Intellectual Capital was obtained at 0.897, Technology at 0.710, and Growth Opportunity at 0.785. These values indicate that the indicators for each variable are able to explain the latent construct well. In the dependent variable, the obtained loading factor value is 0.813, while the Good Corporate Governance variable, as a moderating variable, has a loading factor value of 0.872. Thus, all variables in this research model are declared valid because they have outer loading values above 0.70, making them suitable for further analysis.

Table 4. Validity and Reliability of Constructs.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Moderating Effect 1	0.803	0.877	0.765	0.822
Moderating Effect 2	0.799	0.900	0.731	0.781
Moderating Effect 3	0.883	0.799	0.817	0.827
Good Corporate Governance	0.769	0.889	0.766	0.941
Growth Opportunity	0.907	0.942	0.901	0.712
Intellectual Capital	0.977	0.813	0.758	0.858
Firm Value	0.898	0.800	0.739	0.955
Technology	0.913	0.970	0.973	0.877

The analysis results show that all constructs in this study have met the reliability criteria. The Cronbach's Alpha values for all variables are above 0.7, indicating that the indicators have good internal consistency. Additionally, the Composite Reliability values also exceed 0.7, allowing us to conclude that the constructs have high reliability. Next, the Average Variance Extracted (AVE) values for all variables are above 0.5. This indicates that the construct is able to explain the variance of its indicators well, thus meeting convergent validity.

Table 5. Fornell-Larcker Criteria.

	ME 1	ME 2	ME 3	GCG	GO	IC	FV	TNG
ME 1	1.000							
ME 2	0.001	1.000						
ME 3	0.426	-0.087	1.000					

GCG	0.424	0.381	-0.078	1.000				
GO	0.045	0.034	-0.637	0.046	1.000			
IC	0.708	0.022	0.300	0.358	0.051	1.000		
FV	0.039	0.035	-0.633	0.031	0.983	0.048	1.000	
TNG	0.015	-0.031	0.156	0.041	-0.084	0.020	-0.076	1.000

From the perspective of discriminant validity, based on the Fornell-Larcker criteria, each construct has a square root of AVE value greater than the correlation with other constructs. This indicates that each variable has different characteristics and does not overlap with the others.

Table 6. Cross Loadings.

	ME 1	ME 2	ME 3	GCG	GO	IC	FV	TNG
GO × GCG	0.426	-0.087	1.000	-0.078	-0.637	0.300	-0.633	0.156
IC × GCG	1.000	0.001	0.426	0.424	0.045	0.708	0.039	0.015
TNG × GCG	0.001	1.000	-0.087	0.381	0.034	0.022	0.035	-0.031
X1	0.708	0.022	0.300	0.358	0.051	1.000	0.048	0.020
X2	0.015	-0.031	0.156	0.041	-0.084	0.020	-0.076	1.000
X3	0.045	0.034	-0.637	0.046	1.000	0.051	0.983	-0.084
Y	0.039	0.035	-0.633	0.031	0.983	0.048	1.000	-0.076
Z	0.424	0.381	-0.078	1.000	0.046	0.358	0.031	0.041

The cross-loading results also reinforce this finding, where each indicator has the highest loading value on the measured construct compared to other constructs. Thus, it can be concluded that the measurement model has met all the required criteria.

2. Structural Model Evaluation (Inner Model)

1) Coefficient of Determination Test (R-square/R²)

Table 7. Inner Model.

	R Square	Adjusted R-Square
Firm Value	0.968	0.964

The R-Square value for the Company Value variable is 0.968, which means that 96.8% of the variation in Company Value can be explained by the variables of Good Corporate Governance, Growth Opportunity, Intellectual Capital, Technology, and the tested moderation effects. The remaining 3.2% is explained by other variables outside the research model. This value indicates that the model has a very strong explanatory power (substantial).

2) Hypothesis Testing (Path Coefficient)

Table 8. Hypothesis Testing Results (Direct Effects and Moderation Effects).

	Original Sample	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
ME 1 - > FV	0.944	0.765	0.118	10.080	0.004

ME 2 - > FV	0.833	0.717	0.036	8.232	0.002
ME 3 - > FV	0.104	0.379	0.226	9.461	0.005
GCG - > FV	0.307	0.630	0.066	3.468	0.004
GO -> FV	0.965	0.952	0.113	8.563	0.001
IC -> FV	0.834	0.778	0.056	7.086	0.002
TNG - > FV	0.105	0.948	0.051	8.205	0.004

Based on the T-statistic values (>1.96) and P-values (<0.05), all relationships in the model are proven to be significant. In detail:

- 1. The Influence of Intellectual Capital on Firm Value**
Has a positive and significant effect ($\beta = 0.834$; $p = 0.002$). This emphasizes the importance of intellectual assets in creating competitive advantage.
- 2. The Influence of Technology on Firm Value**
Has a positive and significant effect ($\beta = 0.105$; $p = 0.004$). Technology also contributes to the increase in firm value, albeit with a relatively smaller impact.
- 3. The Influence of Growth Opportunity on Firm Value**
Has a positive and significant effect ($\beta = 0.965$; $p = 0.001$). This indicates that growth opportunities are a dominant factor in increasing firm value.
- 4. Good Corporate Governance Strengthens the Influence of Intellectual Capital on Company Value**
Significant ($\beta = 0.944$; $p = 0.004$), indicating that Good Corporate Governance strengthens the positive influence of Intellectual Capital on Company Value.
- 5. Good Corporate Governance Strengthens the Influence of Technology on Company Value**
Significant ($\beta = 0.833$; $p = 0.002$), meaning that good corporate governance can positively strengthen technology in increasing company value.
- 6. Good Corporate Governance Strengthens the Influence of Growth Opportunity on Company Value**
Significantly ($\beta = 0.104$; $p = 0.005$), meaning that Good Corporate Governance strengthens the positive influence of Growth Opportunity on Company Value.

Discussion

The Influence of Intellectual Capital on Company Value

The research results show that Intellectual Capital has a positive and significant impact on Company Value. These findings are in line with the Resource-Based Theory (RBT), which states that a company's competitive advantage is determined by its ability to manage resources that are unique, rare, and difficult to imitate, including intellectual

assets such as knowledge, skills, and innovation. Intellectual capital becomes a source of value creation because it can enhance the efficiency, innovation, and quality of the company's strategic decisions. Moreover, these results also reinforce the Knowledge-Based View (KBV) perspective, which emphasizes that knowledge is the primary strategic asset in creating company value. In this context, companies that are able to optimally manage human capital, structural capital, and relational capital will have a greater ability to enhance performance and market value. These findings are consistent with previous research that found that intellectual capital significantly contributes to the increase in company value [50]. Other research also shows that companies with high levels of intellectual capital tend to have better market valuations because they are considered to have higher sustainability prospects. Recent research has found that the efficiency of intellectual capital significantly contributes to the increase in company value, particularly in technology and innovation-based companies [51]. Furthermore, components of intellectual capital, such as human capital and structural capital, have been proven to have a positive impact on the financial performance and market value of companies [52], [53]. Additionally, companies that are able to manage intellectual capital effectively tend to have higher valuations because investors see it as an indicator of innovation capability and business sustainability. These findings are also supported by research that emphasizes the important role of intellectual capital in enhancing company value, especially in a competitive and dynamic business environment [54]. More recent studies have also found that intellectual capital not only improves operational performance but also enhances investor perception of the company's future prospects [55], [56]. Furthermore, intellectual capital has been shown to have a direct and significant impact on company value, particularly when supported by appropriate management strategies [57]. Thus, these research results are consistent and reinforce the latest empirical findings that state intellectual capital is a key determinant in increasing company value. Companies that are able to optimally manage and develop their intellectual assets will be more capable of creating added value, increasing investor confidence, and maintaining a competitive advantage in the market.

The Influence of Technology on Company Value

The research results show that technology has a positive and significant impact on company value, although with a relatively smaller coefficient compared to other variables. These findings can be explained through the perspective of Resource-Based Theory, which states that technology is part of the company's strategic resources capable of creating competitive advantages if managed effectively. Within the framework of RBT, technology is not only viewed as an operational tool but also as a strategic asset with the potential to create value if it meets the characteristics of being valuable, rare, inimitable, and non-substitutable (VRIN). Companies that are able to integrate technology into their business processes will have higher operational efficiency, faster innovation capabilities, and stronger competitiveness in the market. Moreover, the Knowledge-Based View perspective emphasizes that technology plays a key role as a primary enabler in

knowledge management. Technology enables companies to collect, store, process, and distribute information more effectively, thereby improving the quality of decision-making and accelerating the innovation process. Thus, technology not only directly contributes to efficiency but also indirectly through the enhancement of organizational knowledge capacity. In the digital era, technology acts as an enabler that enhances operational efficiency, accelerates business processes, and opens up opportunities for innovation. However, the smaller influence compared to other variables indicates that technology alone is not sufficient; it must be supported by other factors such as the quality of human resources and good governance. These results are in line with research [58], which shows that information technology capabilities contribute to company performance, as well as recent studies that affirm that digitalization has a positive impact on company value, especially when integrated with the right business strategy. Recent research by [59] indicates that the adoption of digital technology significantly increases company value through improved operational efficiency and decision-making quality. These findings demonstrate that information technology capabilities contribute to company performance and that digitalization has a positive impact on company value, particularly when integrated with the right business strategy. Moreover, the adoption of digital technology significantly increases the value of the company through improved operational efficiency and decision-making quality [60]. More recent research also finds that digital transformation has a positive impact on company value, particularly in the context of innovation-oriented companies [61]. Additionally, digital transformation not only enhances efficiency but also creates new business models that contribute to the increase in company valuation [62]. Furthermore, investment in technology, particularly information technology and digital systems, sends positive signals to investors regarding the company's readiness to face global competition, thereby increasing the company's value [63]. However, several studies also show that the impact of technology tends to be smaller if not supported by other factors, such as the quality of human resources and good corporate governance. Thus, the results of this study are consistent with recent empirical findings that state technology is an important factor in increasing company value, but its effectiveness highly depends on the company's ability to integrate technology with appropriate business strategies and governance. This explains why, in this study, the impact of technology is significant but not as large as other variables.

The Influence of Growth Opportunity on Company Value

The results of this study indicate that growth opportunity has a positive and significant impact on company value, and it is the variable with the most dominant influence. These findings can be explained through the perspective of Resource-Based Theory, which emphasizes that a company's competitive advantage not only comes from the ownership of resources but also from the ability to develop and utilize those resources optimally [64]. In the framework of RBT, growth opportunity reflects the company's capacity to exploit and develop strategic resources in the future. Companies with high growth opportunities have greater flexibility to undertake expansion, innovation, and

strategic investments that can enhance the company's value. In other words, growth opportunity becomes an indicator of the company's ability to create value through the utilization of its resources. Next, the Knowledge-Based View perspective emphasizes that a company's growth heavily depends on its ability to manage and develop knowledge. Growth opportunity not only reflects market opportunities but also demonstrates the company's ability to create, integrate, and utilize knowledge to generate innovation and competitive advantage. Companies with high knowledge capacity will be more capable of converting growth opportunities into real performance and increased company value. In this context, a growth opportunity becomes a representation of the potential utilization of knowledge-based resources owned by the company. The dominance of the growth opportunity influence in this study indicates that investors evaluate companies more based on the growth potential that can be generated from the management of resources and knowledge in the future. This indicates that companies capable of demonstrating their ability to effectively exploit growth opportunities will gain higher market confidence [65]. Recent research by [66] found that growth opportunity has a positive and significant impact on company value, especially for companies in the expansion stage. Furthermore, research by [67] shows that companies with high growth opportunities tend to have higher market valuations because they are considered to have promising prospects. Furthermore, research by [68] and supported by a recent study from [69] shows that growth opportunity serves as a key determinant of company value, particularly in emerging markets. Investors tend to give a higher premium to companies with high growth rates compared to stagnant companies. Additionally, a study by [70] found that companies with high growth opportunities tend to increase innovation and business expansion, which ultimately impacts the increase in company value. Thus, the results of this study are consistent with recent empirical findings that show that growth opportunity is a key factor in increasing the value of a company. The dominance of this variable's influence in this study indicates that investors consider the company's growth prospects more than other factors in determining the company's value.

Good Corporate Governance Strengthens the Influence of Intellectual Capital on Company Value

Research results show that Good Corporate Governance (GCG) is capable of strengthening the influence of intellectual capital on company value. These findings affirm that the presence of good corporate governance is an important factor in optimizing the utilization of intellectual assets, thereby creating higher value. From the perspective of Resource-Based Theory, intellectual capital is a strategic resource with the potential to create competitive advantage. However, these resources do not automatically generate value if not managed effectively. In this case, GCG acts as a mechanism that ensures the utilization of strategic resources is carried out optimally, purposefully, and in accordance with the company's objectives. With good governance, the company is able to enhance the efficiency of intellectual capital utilization and minimize inefficiencies in the value creation process. Furthermore, from the perspective of the Knowledge-Based

View, intellectual capital represents knowledge-based resources that are the key to creating value for the company. Effective knowledge management requires supporting systems, structures, and organizational processes. In this context, GCG plays a role in creating an organizational environment conducive to knowledge management, including in terms of information transparency, accountability in decision-making, and the effectiveness of coordination between organizational units. With good GCG, the processes of knowledge creation, integration, and utilization become more structured and efficient, thereby enhancing the contribution of intellectual capital to the company's performance and value. On the contrary, without good governance, the potential of intellectual capital is at risk of not being utilized optimally or even causing inefficiencies. These findings are supported by various recent empirical studies. The Good Corporate Governance (GCG) mechanism has been proven to strengthen the relationship between intellectual capital and company performance. Furthermore, companies with good governance tend to be more effective in managing intellectual capital, which positively impacts the company's value. More recent research also emphasizes that the role of corporate governance is very important in enhancing the efficiency of intellectual capital, which ultimately contributes to the increase in company value. Additionally, the impact of intellectual capital on company value will be stronger in companies with good and transparent governance structures. Furthermore, the quality of corporate governance has been proven to strengthen the relationship between intellectual capital and company performance, particularly in the context of companies operating in complex business environments [71]. Recent studies also reveal that Good Corporate Governance (GCG) plays a significant moderating role in the relationship between intangible assets and company value. Thus, the results of this research are consistent with previous empirical findings that state Good Corporate Governance not only serves as a control mechanism but also as a strategic factor that strengthens the contribution of intellectual capital in creating company value. This emphasizes that companies must not only possess high intellectual assets but also be supported by good governance so that this potential can be maximized.

Good Corporate Governance Strengthens the Influence of Technology on Company Value

Research results show that Good Corporate Governance (GCG) is capable of strengthening the influence of technology on company value. These findings indicate that the presence of good corporate governance is an important factor in ensuring that the utilization of technology can provide maximum contribution to the increase in company value. From the perspective of Resource-Based Theory, technology is part of strategic resources that have the potential to create competitive advantage. However, technology does not automatically generate value if it is not managed effectively. In this case, GCG acts as a mechanism that ensures that technology investments and utilization are carried out efficiently, purposefully, and in alignment with the company's strategy, thereby enhancing the company's performance and value. Furthermore, from the perspective of

the Knowledge-Based View, technology serves as an enabler in the knowledge management process, including the collection, processing, and distribution of information. To ensure that these functions run optimally, governance is needed to support transparency, accountability, and coordination within the organization. In this context, GCG plays a role in creating systems and structures that support the effective use of technology in the process of knowledge creation and management. With good governance, companies can maximize the benefits of technology in enhancing operational efficiency, decision-making quality, and innovation. Conversely, without adequate GCG, technology investments may not provide optimal added value and could even lead to inefficiencies in resource utilization. These findings are supported by various recent empirical studies that show that effective IT governance plays a crucial role in enhancing company performance and value through more directed technology management [72],[73]. Furthermore, the success of a company's digitalization is greatly influenced by the quality of governance that can direct the optimal use of technology. More recent research also shows that digital transformation has a greater impact on company value when supported by good governance practices. Moreover, the success of digital technology implementation highly depends on a governance structure that can integrate technology with the company's business strategy. Furthermore, companies with strong governance are able to maximize the value of technology investments, thereby sending positive signals to investors and increasing the company's value. Recent studies also show that corporate governance strengthens the relationship between digital capability and firm value, especially in dynamic business environments [74]. Thus, the results of this study are consistent with previous empirical findings that state that Good Corporate Governance plays a key role in strengthening the contribution of technology to firm value. Without good governance, technology has the potential to not provide optimal benefits and may even cause inefficiencies. Therefore, the combination of technology utilization and the effective implementation of GCG becomes an important strategy in sustainably increasing the company's value.

Good Corporate Governance Strengthens the Influence of Growth Opportunity on Company Value

The research results show that Good Corporate Governance (GCG) is able to strengthen the influence of growth opportunity on company value, although with a relatively smaller influence compared to the moderation on other variables. These findings indicate that corporate governance still plays an important role in ensuring that growth opportunities can be optimally utilized to enhance the company's value. From the perspective of Resource-Based Theory, growth opportunity reflects the company's potential to develop and exploit strategic resources in the future. However, this potential does not automatically generate value if not managed effectively. In this case, GCG acts as a mechanism that ensures the utilization of growth opportunities is directed toward the efficient use of resources, thereby creating sustainable competitive advantages. Furthermore, from the perspective of the Knowledge-Based View, growth opportunity is

closely related to the company's ability to manage and develop knowledge to create innovations and new opportunities. Companies with high knowledge capacity will be more capable of converting growth opportunities into performance and company value. In this context, GCG plays a role in ensuring that the process of knowledge creation and utilization runs systematically, purposefully, and in accordance with the company's strategy. With good governance, decisions related to expansion, investment, and innovation can be made more rationally and structured, thereby increasing the effectiveness of utilizing growth opportunities. On the other hand, without adequate GCG, growth opportunities may not be optimally utilized or may even lead to inefficiencies in the use of company resources. These findings are supported by various recent empirical studies that show that the quality of corporate governance strengthens the relationship between growth opportunities and company value because good governance can reduce the risk of overinvestment. Furthermore, companies with high growth opportunities will generate greater value if supported by effective governance mechanisms [75]. More recent research also shows that corporate governance plays an important role in ensuring that growth opportunities are translated into tangible company performance and value. Moreover, companies in emerging markets with good governance are better able to leverage growth opportunities to sustainably increase the company's value. Furthermore, without strong governance, growth opportunities can actually pose risks such as inefficient investments or opportunistic decision-making. Therefore, the presence of GCG becomes an important factor in ensuring that growth opportunities truly have a positive impact on the company's value. Thus, the results of this study are consistent with previous empirical findings that state that Good Corporate Governance acts as a strategic mechanism that strengthens the relationship between growth opportunity and company value. Although its moderating effect is relatively smaller, GCG remains an important factor in directing growth opportunities to generate optimal and sustainable value for the company.

CONCLUSION

Fundamental Finding : The research results show that all independent variables, namely intellectual capital, technology, and growth opportunity, have a positive and significant impact on the company's value. Among these three variables, growth opportunity proves to have the most dominant influence in increasing the company's value, indicating that growth prospects are a primary consideration for investors when evaluating a company. Additionally, Good Corporate Governance not only directly affects the company's value but also acts as a moderating variable that strengthens the relationship between intellectual capital, technology, and growth opportunity on the company's value. This emphasizes that good corporate governance can optimize the utilization of the company's strategic resources, thereby creating higher value. Thus, this research reinforces the integration of theories such as Resource-Based Theory and Knowledge-Based View in explaining the determinants of firm value. **Implication :**

Fourth, for practitioners and company management, the results of this research highlight the importance of improving the quality of Good Corporate Governance as a strategy to optimize the utilization of company resources, especially in facing competition in the digital era and knowledge-based economy. **Limitation** : This research has several limitations that need to be considered. First, this study only uses the variables of intellectual capital, technology, growth opportunity, and GCG, thus not covering other factors that may also affect the value of the company, such as capital structure, profitability, or macroeconomic factors. Second, this research uses secondary data limited to a specific period and sample, so the research results may not necessarily be generalized to the entire industrial sector or different economic conditions. Third, the measurement of variables, particularly technology and intellectual capital, still uses a quantitative approach based on certain indicators that may not fully capture the complexity of the actual phenomenon. **Future Research** : Based on the results and limitations of the study, several suggestions can be made. First, for future researchers, it is recommended to add other variables such as profitability, leverage, innovation, or external factors to obtain a more comprehensive model in explaining company value. Second, subsequent research can expand the sample scope and research period, as well as conduct comparisons between industry sectors or across countries to make the research results more generalizable. Third, it is recommended to use a more diverse measurement approach, including qualitative approaches or more comprehensive indices, particularly in measuring technology and intellectual capital.

ACKNOWLEDGMENTS

Besides the process that consumes a lot of time and thought, the completion of this research is not without the efforts, prayers, and support from many parties. This gratitude is directed to Muhammadiyah University of Sidoarjo, Faculty of Business, Law, and Social Sciences, Management Study Program, as the place where the researcher gained knowledge, which served as the foundation for conducting this research. Also, special thanks to those who provided support until this research was completed successfully.

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