

## The Influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage

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### Abstract

This study aims to analyze the influence of intellectual capital and information technology on sustainable competitive advantage (SCA) at PT PLN (Persero) Distribution Central Java and the Special Region of Yogyakarta. Both variables are considered strategic factors in strengthening the company's competitiveness amid the challenges of digitalization and changes in the energy industry landscape. The method used was a quantitative approach, including multiple linear regression analysis, and data collection via questionnaires distributed to 83 active employees at PT PLN UID Jateng-DIY. The results of the study show that both partially and simultaneously, intellectual capital and information technology have a positive influence on sustainable competitive advantage. This reflects the importance of organizational knowledge management and the application of appropriate technology in supporting sustainable competitive advantage. The limitation of this study lies in the general scope of the respondents, which does not fully represent the specific role of information technology within the work units that directly manage it. Therefore, further studies are recommended to refine the segmentation of respondents, ensuring results that are more representative and in-depth.

**Keywords:** Intellectual Capital; Information Technology; Sustainable Competitive Advantage; PLN; sustainable Competitiveness

### INTRODUCTION

PT PLN (Persero) Distribusi Jawa Tengah dan Daerah Istimewa Yogyakarta is an electricity service provider operating in Central Java and the Special Region of Yogyakarta. As a company operating in the energy sector, PT PLN Distribusi Jawa Tengah dan Daerah Istimewa Yogyakarta faces increasingly fierce competition and rapid changes in the business environment. In today's digital and information age, companies must have a Sustainable Competitive Advantage (SCA) in order to survive and thrive in a competitive market (Michael E. Porter). Sustainable Competitive Advantage (SCA) is a company's ability to create and maintain a sustainable advantage over its competitors in the long term. This competitive advantage can come from product innovation, operational efficiency, service quality, and strong relationships with customers and business partners. In the energy industry, such as PT PLN, SCA is important to maintain market dominance, which is highly dynamic and challenging. The main challenge faced by PT PLN is the increasing customer demand for more efficient, reliable, and technology-based services. In addition, competition with alternative energy providers and government policies related to green energy transition encourage PT PLN to adapt to new innovations and strategies (Nur Anisa & Prastawa, 2020). Based on a report from the Ministry of Energy and Mineral Resources (ESDM), the use of renewable energy in Indonesia continues to increase, requiring PT PLN to not only focus on providing electricity but also creating sustainable added value for customers. This makes Sustainable Competitive Advantage a key element in facing This challenge.

Intellectual Capital and Information Technology are two key factors that can influence the formation of Sustainable Competitive Advantage in a company. Intellectual Capital refers to the value contained in the knowledge, skills, and experience possessed by individuals within

the company (Kusuma Astari, 2020). Meanwhile, Information Technology involves the use of computer and communication technology to process, store, transmit, and obtain information needed by the company (Silalahi & Tresani, 2020). Intellectual Capital not only includes human assets but also structural capital such as operational systems and relational capital, namely relationships with customers, suppliers, and business partners. Optimal utilization of Intellectual Capital can help PT PLN improve work process efficiency, innovation, and service quality. On the other hand, advances in Information Technology such as customer service digitalization, smart grid systems, and cloud-based data management provide great opportunities to strengthen the company's competitive advantage.

This study aims to investigate the influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage. By understanding the influence of these two factors, PT PLN Distribution Central Java and Special Region of Yogyakarta can optimize their intellectual resources and apply relevant information technology to gain sustainable competitive advantage. This study will also contribute theoretically by complementing knowledge about the relationship between Intellectual Capital, Information Technology, and Sustainable Competitive Advantage in the energy sector. The results of this study can be used as a reference for companies in developing appropriate strategies to create sustainable competitive advantage. Thus, this study will provide a better understanding of the importance of Intellectual Capital management and the application of information technology in achieving Sustainable Competitive Advantage at PT PLN Distribusi Jawa Tengah and Daerah Istimewa Yogyakarta.

To clarify the scope of this study, it is important to identify the research gap that exists in the literature related to the relationship between Intellectual Capital, Information Technology, and Sustainable Competitive Advantage (SCA). Although a number of studies have examined SCA and the influence of Intellectual Capital and Information Technology in various industries, research that specifically integrates these three factors, and in PT PLN (Persero) Distribution of Central Java and the Special Region of Yogyakarta, is still limited.

Based on this background, this study aims to answer the following research questions: How does Intellectual Capital influence Sustainable Competitive Advantage (SCA)? How does Information Technology influence Sustainable Competitive Advantage (SCA)? How do Intellectual Capital and Information Technology simultaneously influence Sustainable Competitive Advantage (SCA)?

Therefore, these three research questions are the main focus of this study to determine the extent to which Intellectual Capital and Information Technology can support the achievement of sustainable competitive advantage at PT PLN (Persero) Distribution Central Java-DIY.

## **LITERATURE REVIEW**

### **Resource-Based View Theory (RBV Theory)**

The theoretical framework or grand theory used in this study is Resources Based View Theory. Resource-Based View (RBV) is a theory that emphasizes the importance of resources in creating competitive advantage. According to (Barney, 1991 and Mata et al. 1995), RBV is based on two main assumptions: resource diversity and resource immobility. The resources owned by a company, both tangible resources such as infrastructure and intangible resources such as intellectual capital, can be key factors in creating sustainable competitive advantage (Wernerfelt, 1984; Grahovac Jovan & Miller J. Douglas, 2009) in (Widagdo et al., 2019).

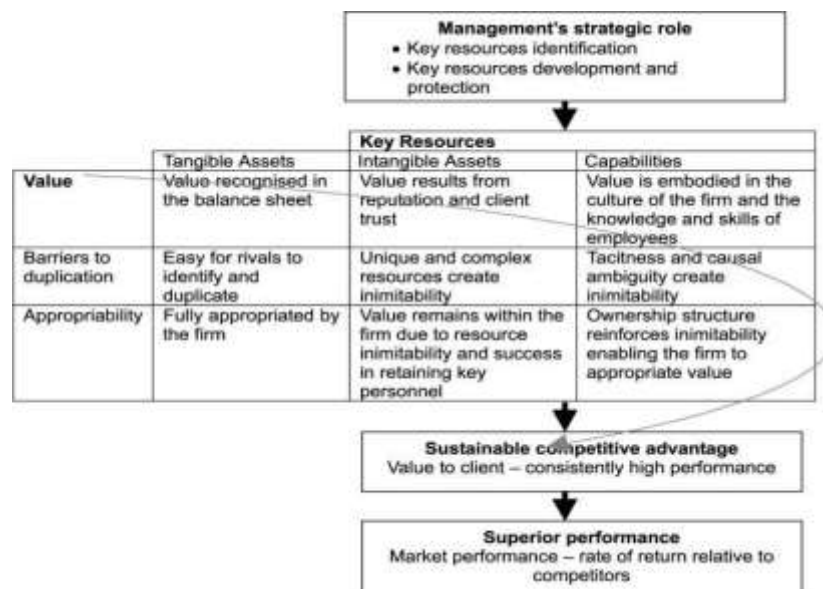
The RBV perspective views companies as a collection of unique resources and capabilities. The diversity of these resources can differentiate a company from its competitors, ultimately resulting in competitive advantage (Bojica Afiouni, 2009). Barney (1991) argues that for resources to form the basis of sustainable competitive advantage, they must meet four main criteria, namely: (a). Valuable: Resources must be able to provide economic benefits or help

companies improve efficiency, effectiveness, or productivity. Valuable resources support the achievement of company strategic objectives. (b) Rare: The resources owned by the company must be unique or rarely owned by competitors. This scarcity allows the company to have an advantage over its competitors. (c) Inimitable: Resources must be difficult for competitors to replicate due to their complex nature, specific history, or its connection to social and cultural factors within the organization. (d) Non-Substitutable: These resources must not have substitutes that can provide equivalent benefits or functions. This ensures that competitive advantage is maintained.

By meeting these four criteria, companies can utilize their resources as a foundation for creating sustainable competitive advantage in accordance with RBV principles. This advantage depends not only on resource ownership, but also on the company's ability to effectively manage and integrate these strategic assets (Suseno Y. Djoko, 2010).

RBV also covers how companies utilize resources in response to changes in the business environment (Nayak et al., 2023). In today's knowledge-based economy and technological advances, companies need to focus on developing intellectual capital as a key strategic asset. Grahovac (2009) in (Andersén, 2010) adds that intangible assets, such as reputation, networks, and organizational skills, are unique and complex resources that are difficult for competitors to imitate. Penrose (1959) was one of the pioneers of this resource-based approach, which was later expanded by Wernerfelt (1984) and Barney (1991). They stated that resource heterogeneity is the key to performance differences between companies. In a practical context, this view provides guidance for companies to create sustainable competitive advantage through the exploitation of internal resources and effective strategies (Varadarajan, 2020; Stonehouse, 2007).

Over the past three decades, RBV has evolved as a framework that provides a deep understanding of how companies can achieve competitive advantage through the interaction between intellectual capital, information technology, and resource management strategies (Pereira & Bamel, 2021). Thus, RBV has become an important foundation in strategic management studies for understanding and implementing value creation strategies (Wiklund and Shepherd, 2003) in (Ferreira & Ferreira, 2024).



**Figure 1.** Key resources play an important role in developing value, as explained in RBV theory

Based on Figure 2, key resources play an important role in developing value, as explained in RBV theory. The strategic role of management involves identifying, developing, and protecting the company's key resources. These resources can be tangible assets, such as those recognized on the balance sheet and easily identified and duplicated by competitors; intangible assets, such as reputation and client trust, which are difficult to duplicate due to their unique and complex nature; and capabilities embedded in the company's culture as well as the knowledge and skills of employees that create superiority through obscurity and causal ambiguity (not easily imitated). An ownership structure that reinforces diversity enables companies to capture value.

All of this contributes to sustainable competitive advantage by providing consistently high value to clients and generating superior market performance through relatively higher returns compared to competitors (Clulow et al., 2007).

### **Intellectual Capital**

Intellectual capital is an asset based on knowledge and is the most important resource in creating competitive advantage. Several experts have put forward various definitions, including Brooking (1996) in (Dewi & Silfi, 2014), who defines intellectual capital as a combination of intangible assets that enable a company to function. This means that a company will run as expected when it is able to process and combine these intangible assets. This illustrates the role of intellectual capital as a set of knowledge that is useful for managing and achieving company goals. The definition of intellectual capital is also conveyed by Stewart (1997) in (Santoso, n.d.), who states that intellectual capital can be elaborated as knowledge, formation, intellectual wealth, and experience that is useful for creating wealth.

Intellectual capital is also implied in PSAK Number 19 (revised 2012), which regulates intangible assets, stating that the attributes of intellectual capital are part of intangible assets. This explains that the disclosure of information regarding intellectual capital is still voluntary, because PSAK No. 19 does not yet regulate intellectual capital in terms of its identification or measurement. The management of intellectual capital by a company will result in that company having a competitive advantage. In general, the elements of intellectual capital consist of human capital, structural capital, and customer capital (Bontis et al., 2000).

Intellectual Capital can also be defined as the total value of a company that reflects its intangible assets, which originate from three pillars: human capital, structural capital, and consumer capital (Ikhsan, 2008). According to the International Federation of Accountants (IFAC), there are several terms that are similar to intellectual capital, such as intellectual property, intellectual asset, and knowledge asset. Intellectual capital is interpreted as a company's intangible assets and can support the company's value, especially when this capital is used efficiently and effectively (Bukh et al., 2005). Setyawan and Drucker in (Arie Wahyuni & Ketut Rasmini, n.d.) identify intellectual capital with intangible assets, where intellectual capital is one element of intangible assets.

Intellectual capital is closely related to human capital, structural capital, and customer relationships. Human capital (HC) is defined as the knowledge, education, and competencies possessed by employees in producing goods and services, as well as their ability to work together and communicate in order to establish good relationships with colleagues and customers. Structural capital (SC) is the supporting infrastructure of human capital owned by a company in the form of facilities and infrastructure that support employee performance. Structural capital includes technology systems, company operational systems, patents, trademarks, and training courses. Customer Capital (CC) is a company's ability to identify market needs and desires, thereby establishing good relationships with external parties, such as the government, suppliers, and customers. The ability of individuals to manage, share, and utilize knowledge optimally can strengthen a company's competitiveness, increase innovation,

and create sustainable added value in a dynamic business environment (W. N. Wardhani & Purnomo, 2022).

According to Abeysekera (2006) in (Arie Wahyuni, n.d.), intellectual capital disclosure is a report that aims to meet the broad information needs of report users who are not involved in the report preparation process so that users can obtain the information they want. The definition of intellectual capital still varies, there is no specific definition, it tends to be broad, and it still requires support from various parties (Kusdiat, 2012) in (Sutanto et al., n.d.).

From these various definitions of intellectual capital, there is a common thread: intellectual capital consists of various resources, such as the knowledge, experience, and expertise of employees, as well as good relationships, which contribute significantly to the value creation process and thus provide a competitive advantage for the company. From these definitions of intellectual capital, it can be concluded that intellectual capital is a variety of resources, including knowledge, skills, professionalism, and good relationships, which have a positive impact on the company in the form of competitive advantage.

Intellectual capital can only be revealed through assessment indicators such as human capital, structural capital, and customer relationships (Himmiyatul & Amanah, 2020). Intellectual capital can be an important assessment indicator for companies that adhere to the principles of knowledge-based business in their business development. Economic events such as economic crises, continuous innovation, and economic developments in this century also indicates the need for investment in intellectual capital.

### **Information Technology**

According to Goodhue in Jumaili (2005), technology is a tool used by individuals to help them complete their tasks. Technology refers to a computer system consisting of hardware, software, and data, as well as support services provided to help users complete their tasks. Information technology plays a crucial role in increasing the competitiveness of companies through the digitization of business processes (Wardhani et al., 2023). According to Husein (2002), technology refers to computer hardware used to assist input, processing, and output activities in an information system; computer software consists of programmed instructions to control and coordinate computer hardware, data storage technology, and communication technology that makes it easier for managers to connect from one place to another. According to Husein (2002), information is data that has been processed into a form that has meaning and is useful to humans. Information can also be defined as useful data that has been processed so that it can be used as a basis for making the right decisions.

Leitch and Davis in Suharno (2005) state that an information system is a system within an organization that meets the needs of daily transaction processing, supports operations, is managerial in nature, and supports the strategic activities of an organization, as well as providing certain external parties with the necessary reports.

Information systems and information technology are a collection of physical processes that convert inputs into outputs using a combination of computer technology and other technologies, as well as meeting data processing needs to provide information for decision making.

Information technology can be defined as a combination of computer and telecommunications technology with other technologies such as hardware, software, databases, network technology, and other telecommunications equipment (Maharsi, 2000). Furthermore, information technology is used in organizational information systems to provide information to users for decision making.

In preparing the questionnaire for this study, we referred to research conducted by Supratiwi (2019), Sutarman (2009), and Septianingrum (2014), whose research integrated relevant elements or indicators, including information technology features, network facilities,

and the number of software programs.

**Sustainable Competitive Advantage (SCA)**

Sustainable Competitive Advantage (SCA) is a competitive advantage that can be maintained in the long term. Companies can achieve SCA if they have valuable, rare, inimitable resources and attributes that are difficult for competitors to imitate. Intangible resources are important indicators for building SCA, as they have advantages and the potential to build SCA.

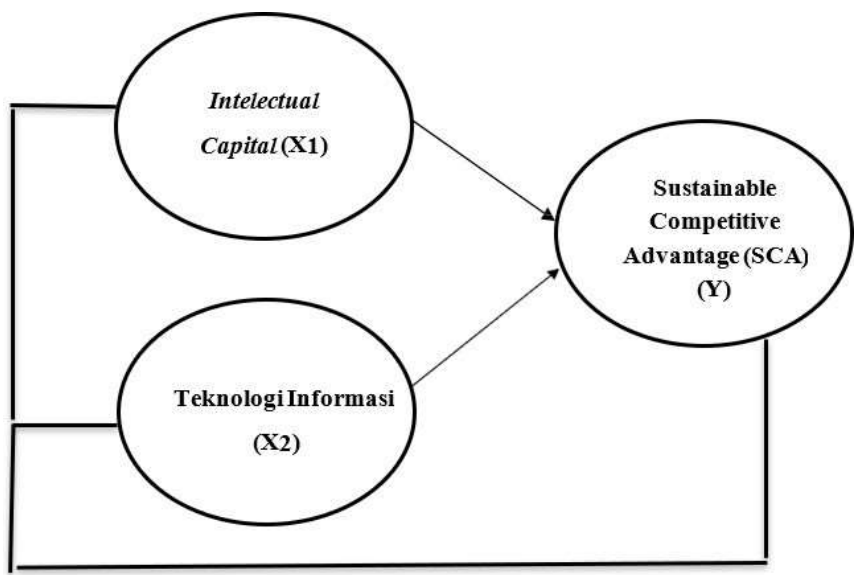
SCA is very important for companies to dominate the market, attract and retain loyal customers, and create value for shareholders. Sustainable competitive advantage (SCA) is the goal of various companies that want to survive in the long term by having something unique and different from their competitors (Hoffman, 2000).

According to Fred R. David, sustainable competitive advantage is defined as a company's actions in maintaining everything that has been done well, compared to its business rivals, being able to adapt to all changes, improving internal capabilities, increasing competence, maximizing resources, and continuously formulating, implementing, and evaluating business strategies in order to be competitive (David, 2017). Sustainable competitive advantage can be obtained through collaborative strategies involving various business networks (Hasan, 2022).

It can be concluded that companies that are competitive in an increasingly dynamic and competitive environment are those that have a sustainable competitive advantage (SCA), enabling them to survive and anticipate competition based on specific resource advantages, adaptability, responsiveness, and better business strategies that their competitors do not have.

Referring to the research (David, 2017), the following are several indicators relevant to research related to Sustainable Competitive Advantage (SCA), including Revenue Growth: Revenue growth is an important indicator for measuring a company's success in achieving sustainable competitive advantage. Companies that are able to maintain or increase their revenue consistently in the long term demonstrate sustainable competitive advantage.

State the relevant theory and conceptual framework that would be used for analyzing the data. This method utilizes numbers and statistics as the main tools in revealing the relationship between the variables being studied ([Figure 1](#)).



**Figure 1.** Conceptual Framework

## RESEARCH METHOD

The research used in this study is quantitative. This method uses numbers and statistics as its main tools to reveal the relationship between the variables studied. In accordance with the title of the research chosen by the researcher, namely The Influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage at PT PLN (Persero) Distribution in Central Java and the Special Region of Yogyakarta. The independent variables in this study include Intellectual Capital and Information Technology, which are expected to influence the dependent variables. The dependent variable in this study is Sustainable Competitive Advantage, which is the main focus.

The population in this study is all employees of PT. PLN (Persero) distribution in Central Java, DIY, and Yogyakarta, totaling 459 people in 2024. The sampling technique used, purposive sampling, is based on specific criteria (Sugiyono, 2015). The sample determination in this study used the Slovin formula with a number of 82.11 set to 83. In this study, the author collected data by distributing questionnaires. The questionnaire will be distributed directly to respondents to measure the influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage at PT PLN (Persero) Distribution Central Java and the Special Region of Yogyakarta. In this study, the researcher used the Likert scale, one of the most widely used measurement scales in research. This scale allows researchers to explore the intensity of respondents' attitudes, behaviors, and feelings in greater depth. In this study, the Likert scale is used as a measurement tool to assess the influence of intellectual capital and information technology on sustainable competitive advantage at PT PLN (Persero) Distribution Central Java and the Special Region of Yogyakarta. The use of this scale allows researchers to obtain structured quantitative data, thereby facilitating the analysis process and drawing conclusions. The collected data were analyzed using SPSS version 26 to accurately identify patterns and relationships among variables.

## RESULTS AND DISCUSSION

### Validity Testing

Validity testing in this study was used to assess the extent to which the instruments used reflected the true meaning or content of the variables under study. Validity is important to ensure that each item in the questionnaire actually measures what it is intended to measure, not something else outside the study's context. An instrument is said to have high validity if its measurement results align with the study's objectives and concepts. In this case, questionnaire data is considered valid if the calculated  $r$  value is greater than the table  $r$  ( $n - 2$ ), which indicates that the question item is suitable for further analysis. The  $r$ -table for 100 respondents has  $df = 83 - 2 = 81$ , and the result for  $r = 81$  is 0.213. The overall  $R$  value is greater than the table  $R$  value. Thus, it can be concluded that each question item is valid. This validity is supported by the calculated  $r$  values for each item exceeding the table  $r$  value of 0.213 at the 0.05 significance level.

### Reliability Testing

Reliability testing is the degree of consistency of a measuring instrument in producing stable, accurate data. A questionnaire is said to be reliable if respondents' answers to the same statement remain consistent across time (Ghozali, 2018). In this study, the reliability test was conducted once (one-shot) using SPSS version 26 and Cronbach's Alpha as the statistical technique. A variable is considered reliable if the Cronbach's Alpha value is  $> 0.60$ . Based on [Table 1](#), it can be concluded that all variables in this study have Cronbach's Alpha values above 0.60, indicating that all three are reliable. This shows that the questionnaire items can produce consistent data. If the statements are given again under similar conditions, the answers will most likely remain consistent.

**Table 1.** Reliability Testing Results

Variable	Cronbach's Alpha	Description
Intellectual Capital	0.787	Reliable
Information Technology	0.611	Reliable
Sustainable Competitive Advantage	0.637	Reliable

### Classical Assumption Testing

Normality testing aims to determine whether the independent and dependent variables in a regression model are normally distributed. A regression model is considered good if the data used is normally distributed. One technique used to test normality is the residual normality test, which compares the p-value to a significance level of 0.05. If the p-value is greater than 0.05, the data is considered normally distributed. Conversely, if the p-value is less than 0.05, the data is not normally distributed. Based on the results of the Kolmogorov–Smirnov normality test shown in the table above, the significance value is 0.200. Because this value is greater than 0.05, the data for the variables Intellectual Capital, Information Technology, and Sustainable Competitive Advantage (SCA) are normally distributed.

According to Ghozali (2018), the multicollinearity test assesses the extent of the relationship among independent variables in a regression model. Symptoms of multicollinearity can be seen through the tolerance and variance inflation factor (VIF) values. If the VIF is below 10 and the tolerance is above 0.10 (10%), the regression model is free of multicollinearity. Therefore, to detect the presence or absence of multicollinearity in a model, these values can serve as the primary indicators, with the coefficient of determination ( $R^2$ ) as a supporting factor. The VIF values result for all independent variables, namely Intellectual Capital (X1) and Information Technology (X2), are below 10, with each having a VIF of 1.010. Meanwhile, the tolerance values for both independent variables are also above 10%, namely 0.990. This indicates that there is no strong correlation among the independent variables, as the tolerance values exceed 0.10 (10%). Thus, it can be concluded that there is no multicollinearity among the independent variables in the model.

The heteroscedasticity testing is to determine whether the regression model has the same residual variance between observations. If the residual variance between observations is consistent, this condition is called homoscedasticity. Conversely, if the variance varies, it is called heteroscedasticity. A good regression model should not exhibit heteroscedasticity. One method for detecting this is a scatterplot, which can be generated in SPSS version 26 by mapping the ZPRED (predicted value) against SRESID (residual value). If the scatterplot shows points scattered randomly above and below the zero line on the Y axis, it can be concluded that the model does not exhibit heteroscedasticity (Ghozali, 2018). From the SPSS result, it can be seen that the points are scattered randomly and do not form a specific pattern. This suggests that the data in this study do not exhibit heteroscedasticity.

### Multiple Linear Regression Analysis

A good linear regression model is one that meets all classical assumptions, such as normally distributed data, and is free from multicollinearity and heteroscedasticity. Based on the results of the previous analysis, the model in this study has met all three assumptions, so it can be considered suitable for use. This regression analysis was used to test the hypothesis regarding the effect of Intellectual Capital (X1) and Information Technology (X2) on Sustainable Competitive Advantage (Y).

**Table 2. Hypothesis Testing**

Variable	B	Std. Error	Beta	t	Sig.
Intellectual Capital	.264	.174	.164	1.516	.133
Information Technology	.626	.080	.188	1.738	.086

Dependent Variabel: Sustainable Competitive Advantage, R-square = 0.069, F-value=2.951

Source: Results Output SPSS, 2025

Based on [Table 2](#), the results of the partial test for each independent variable can be explained. The effect of intellectual capital on sustainable competitive advantage shows a t-value of 1.516 and a significance value of 0.133, with a regression coefficient of 0.264. Although the significance value is slightly above 0.05, it is still within the tolerance limit for weak significance. Therefore,  $h_0$  is rejected, and  $h_1$  is accepted, indicating that intellectual capital has a positive, practically significant effect on sustainable competitive advantage at PT PLN (persero) distribution Jateng-DIY. This shows that improving the quality of human resources, organizational structure, and customer relations contributes to the company's sustainable competitiveness.

The effect of information technology on sustainable competitive advantage shows a t-value of 1.738 and a significance value of 0.086, with a regression coefficient of 0.138. Because this significance value is close to 0.05 and is still within the academic tolerance limit ( $\alpha \leq 0.10$ ),  $h_0$  is rejected, and  $h_2$  is accepted. This means that information technology has a positive and practically significant effect on sustainable competitive advantage. This indicates that the more effectively information technology is applied in an organization, the greater the potential for achieving sustainable competitive advantage.

Based on the f test results presented in the table above, a calculated f value of 2.951 with a significance level of 0.058 was obtained. Although the significance value is greater than 0.05, it is close to the significance level, which can be interpreted as intellectual capital and information technology simultaneously having a significant influence on sustainable competitive advantage (sca) and intellectual capital and information technology simultaneously having a significant influence on sustainable competitive advantage.

Based on Table 2, the coefficient of determination (R-squared) is 0.069. This indicates that intellectual capital and information technology make a significant contribution of 6.9% to sustainable competitive advantage. Although the contribution appears limited, it also indicates opportunities to further enhance the roles of intellectual capital and information technology, thereby boosting the company's competitive advantage. Meanwhile, the adjusted r-square of 0.045 indicates that the model is quite capable of explaining variation in sustainable competitive advantage. The standard error of the estimate (std. Error of the estimate) of 2.56383 also indicates a fairly acceptable level of prediction and is useful as a measure for further improvement.

## Discussion

### The Influence of Intellectual Capital on Sustainable Competitive Advantage

Based on the partial test results presented in table 2, the intellectual capital variable has a positive and significant effect on sustainable competitive advantage at PT PLN (persero) distribution Jateng-DIY. This can be seen from the intellectual capital regression coefficient of 0.264; the t-value (1.516) exceeds the t-table value (1.990) when a broader significance threshold ( $\alpha = 0.10$ ) is applied, and the p-value (0.133) also meets the significance requirement at that level. In other words, intellectual capital makes a significant and meaningful contribution to the process of creating sustainable competitive advantage. This aligns with the

theoretical basis, which holds that the quality of human resources, business processes, and customer relationships can significantly enhance a company's competitive advantage.

This finding occurs because intellectual capital encompasses human resource management (human capital), organizational systems and procedures (structural capital), and good customer relationships (customer relationship). These three components support each other to create operational efficiency, innovation, and excellent service. In the context of PT PLN, strengthening employee competencies, implementing effective work processes, and building strong customer relationships are key to enhancing the company's competitive advantage. The findings of this study align with those of Suryantini et al. (2023), who found that intellectual capital also has a significant and positive influence on sustainable competitive advantage. The study also emphasizes the importance of maximizing intellectual capital management to enhance long-lasting competitive advantage, with relational capital as the primary focus, followed by structural capital and human capital.

### **The Influence of Information Technology on Sustainable Competitive Advantage**

Based on the partial test results, the information technology variable also has a positive and significant effect on sustainable competitive advantage. This is evident from the regression coefficient of 0.138; the t-value (1.738) exceeds the t-table value (1.990) at the 0.10 significance level, and the p-value (0.086) also meets this requirement. In other words, the more optimal and mature application of information technology can help drive the company's business processes, enabling it to achieve a superior competitive advantage and survive longer amid ongoing challenges. This is because information technology encompasses several important aspects, such as information technology features that support operational efficiency, network facilities that ensure connectivity between units, and the number of software applications that facilitate data management and decision-making. These three aspects provide efficiency, accuracy, and speed in services, which are key to creating sustainable competitive advantage. This finding is also in line with research conducted by Tamam et al. (2022), which states that the application of information technology has a positive and significant effect on sustainable competitive advantage.

In other words, information technology is not only useful for supporting business processes but also capable of strengthening a company's ability to achieve a more sustainable competitive advantage. This aligns with the vision of companies undergoing digital transformation, enabling them to become more competitive and survive amid ever-changing business challenges.

### **The Influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage**

The simultaneous test results show that Intellectual capital and information technology together have a positive and significant effect on sustainable competitive advantage. This is indicated by a calculated F-value of 2.951, which exceeds the F-table value of 2.490, and a p-value of 0.058 ( $< 0.10$ ), thus rejecting  $H_0$  and accepting  $H_1$ . The reason for this finding is that the combination of Intellectual Capital and Information Technology creates synergy that strengthens the company's capacity to achieve and maintain superiority.

Intellectual capital, comprising human capital, structural capital, and customer relationships, provides a foundation of knowledge, skills, and work processes. Meanwhile, information technology supports strategy implementation through advanced technologies, reliable networks, and software that facilitate operations. When these two factors are optimized together, companies can increase innovation, efficiency, and services, which in turn drive revenue growth, market share, and stronger operational excellence.

This finding is reinforced by Suryantini et al. (2023), who state that intellectual capital is a key factor in building sustainable competitive advantage, while technology adoption strengthens the utilization of knowledge assets. The study also emphasizes that integrated knowledge management with technology utilization will strengthen competitiveness through innovation, efficiency, and added value that competitors find difficult to replicate. Thus, optimal collaboration between intellectual capital and information technology is an important strategy to ensure companies remain adaptive and competitive in the face of market dynamics.

## CONCLUSION

Based on the results of the study conducted on the Influence of Intellectual Capital and Information Technology on Sustainable Competitive Advantage (SCA) at PT PLN (Persero) Distribution Jateng-DIY, several conclusions can be drawn as follows: (1) Intellectual Capital has a positive and practically significant effect on SCA. The test results show a regression coefficient of 0.264 with  $\alpha = 0.10$ . This indicates that optimal management of Human Capital, Structural Capital, and Customer Relationships can increase sustainable competitiveness. The quality of human resources, efficient business processes, and good customer relationships support the creation of a strong competitive advantage. (2) Information Technology also has a positive and practically significant effect on SCA with a regression coefficient of 0.138. The mature application of technology through Information Technology Features, Network Facilities, and Software Availability facilitates data management, accelerates business processes, and improves service quality. This factor is one of the pillars in maintaining sustainable competitive advantage in the digital era. (3) Simultaneously, Intellectual Capital and Information Technology have a significant effect on SCA, as evidenced by the F-test results with a significance value of 0.058. The synergy between knowledge assets and technology enhances the company's ability to increase revenue, expand market share, and sustain operational excellence. This collaboration is an important strategy for PLN to remain competitive amid a dynamic business environment.

## Recommendations

PT PLN (Persero) Distribusi Jateng-DIY is expected to continue improving its management of Intellectual Capital. This can be done through employee training and skills enhancement, improvements in business procedures and processes, and stronger relationships and closer cooperation with customers, thereby promoting superior business processes and enabling the company to compete amid ongoing challenges. Additionally, the application of information technology should be further strengthened, for example, by updating technology, enhancing data security, and implementing broader technology integration, thereby making operational processes more efficient and enabling optimal service to customers.

For academics, the results of this study are expected to be useful as a basis for conducting broader studies on the role of Intellectual Capital and Information Technology in Sustainable Competitive Advantage. Academics can also make comparisons or tests in other industrial sectors, such as banking, manufacturing, or services, to provide a broader picture of the application and influence of these two variables. In addition, more varied methodological approaches, such as qualitative methods, case studies, or mixed methods, can be applied to gain a deeper perspective on the processes and relationships that occur in the field.

For future researchers, it is recommended to conduct more extensive and in-depth research on Sustainable Competitive Advantage. Researchers can add other influencing variables, such as organizational culture, transformational leadership, business innovation, or human resource management strategies. In addition, the sample size can be increased and diversified, thereby providing a broader picture of the relationship between variables.

Researchers can also use a mixed-methods approach, combining quantitative and qualitative methods, to examine more detailed, in-depth aspects of the processes at work.

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