

The Effect of Knowledge Sharing and Project Leadership on Work Productivity with Work Commitment as an Intervening Variable in the PLN UP2K Kaltim Village Electricity Network Development Project

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Abstract. *This study aims to analyze how the influence of Knowledge Sharing and Project Leadership on Work Productivity with Work Commitment as an intervening/mediation variable, in a Village electricity network development project whose implementation is full of social dynamics and also difficult geographical conditions quantitative with explanatory research methods through questionnaires distributed online via Google Forms as a data source. The objects of this study are PLN UP2K Kaltim employees and Implementing Partners (Vendors) in the village electricity development project with a sample method from the total population using the Slovin formula with a margin of error of 5%, where the total population is 110 people and the sample obtained is 86 people. The data were analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method through SmartPLS data processing software version 4.1.1.1. The results of the study showed that Knowledge Sharing and Project Leadership had a significant positive effect on Work Commitment, but did not directly affect Work Productivity, however, Work Commitment as an intervening/mediating variable successfully influenced Knowledge Sharing and Project Leadership on Work Productivity.*

Keywords: *Knowledge Sharing; Project Leadership; Work Commitment; Work Productivity.*

1. Introduction

The village electricity grid development project is one of the government's strategic programs to increase energy access and accelerate infrastructure development in rural areas. The success of this project depends heavily on the productivity of the project workforce involved in the field. In this context, human resource management is a crucial aspect influencing the effectiveness and efficiency of project work. According to data from the Indonesian Ministry of Energy and Mineral Resources (ESDM), access to electricity not only contributes to improved quality of life but also positively impacts local economic growth. In East Kalimantan, where many villages still lack access to electricity, this project is a top priority. However, the challenges faced in this development project are quite complex, involving many parties and resources that must be managed effectively. This project requires not only significant financial investment but also effective human resource management.

Two important factors that can influence Work Productivity are Knowledge Sharing and Project Leadership. In this context, Knowledge Sharing (KS) and Project Leadership are two key factors that can influence Work Productivity. The role of Knowledge Sharing in the context of development projects is crucial. Research shows that organizations that implement knowledge sharing practices are able to increase innovation and operational efficiency. For example, in infrastructure development projects in remote areas, sharing knowledge between team members can accelerate problem solving and improve project performance. In practice, team members who share experiences and solutions to facing the same challenges can create a productive learning environment. For example, in an electricity development project in a village, team members who have experience in solar panel technology share insights with their colleagues, thus assisting in the implementation of the work and reducing the time required to complete the installation and improving the quality of the final result.

On the other hand, effective project leadership also contributes significantly to work productivity. Project leaders who are able to inspire their teams and create a collaborative work environment will produce better performance (Yukl, 2010). Good leaders not only provide clear direction but are also able to listen to input from team members, thereby creating a sense of ownership of the project. In a village electricity development project, a proactive project leader held regular meetings to discuss progress and challenges faced, so that each member felt appreciated and motivated to contribute more to the work implementation.

PLN as a government company responsible for providing electricity in Indonesia and also has a target to increase the ratio of electrified villages, in this case the division in PLN that manages and implements village electricity development projects is the Electricity Project Implementation Unit (UP2K).

In East Kalimantan Province, developing village electrification is not easy and presents a unique challenge given the diverse geographic and social conditions. According to data from PLN UP2K Kaltim, by 2025, the electrification ratio in East Kalimantan will only reach 95.34%, with the ratio of villages with PLN electricity reaching approximately 89.60% of the total number of villages in East Kalimantan, which is 1,038 villages, and 935 villages with PLN electricity. PLN UP2K Kaltim is targeted to increase and achieve the 100% electrification ratio and the ratio of villages with electricity. To achieve this, PLN UP2K Kaltim needs to implement a strategy that involves knowledge sharing and strong project leadership, as well as a serious work commitment.

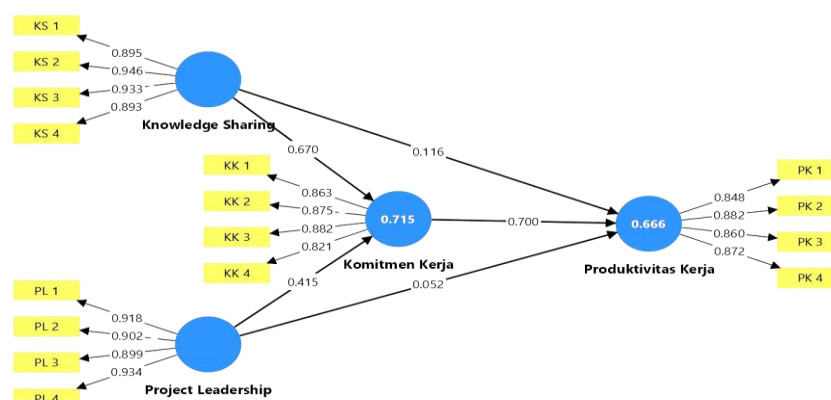
2. Research Methods

This research uses a quantitative approach with an explanatory research method. This method is used to explain the causal relationship between variables through hypothesis testing and provide a deeper understanding of how and why certain variables influence each other statistically. This approach was chosen because it can provide a deeper understanding of how the interaction between these variables affects Work Productivity in the context of a village electricity development project. According to Creswell (2014), a quantitative approach is very effective for testing predetermined hypotheses and for measuring the relationship between variables. In the context of this study, the researcher will examine the effect of Knowledge Sharing and Project Leadership on Work Productivity, as well as the role of Work Commitment as an intervening variable. To test the hypothesis of this study, the Structural Equation Model (SEM) model is used.

3. Results and Discussion

3.1. Results Evaluation of Measurement Model (Outer Model)

The outer model analysis aims to assess how the measurement constructs of the latent variables. The outer model evaluation is carried out by testing convergent validity (outer loading and AVE), consistency reliability (Cronbach's alpha and CR), and discriminant validity (Fornell-Larcker and HTMT) using the Smart PLS 4.0 application.



3.2. Convergent Validity

a. Convergent Validity

Convergent validity can be determined by the correlation between item or indicator scores and their constructs. An indicator is considered reliable if it has a correlation value of ≥ 0.7 . However, in scale development research, Factor Loading (LF) values of ≥ 0.5 – 0.6 are still acceptable, and LF values ≤ 0.4 must be removed from the model (Ghozali, 2015).

Table Convergent Validity Results

Indicator	Knowledge Sharing (KS)	Project Leadership (PL)	Work Commitment (KK)	Work Productivity (PK)	Information
KS 1	0.895				Valid
KS 2	0.946				Valid
KS 3	0.933				Valid
KS 4	0.893				Valid
PL 1		0.918			Valid
PL 2		0.902			Valid
PL 3		0.899			Valid
PL 4		0.934			Valid
KK 1			0.863		Valid
KK 2			0.875		Valid
KK 3			0.882		Valid

KK 4			0.821		Valid
PK 1				0.848	Valid
PK 2				0.882	Valid
PK 3				0.860	Valid
PK 4				0.872	Valid

Source: SEM-PLS 4 Output Data

Based on the table above, it can be seen that the loading factor value of all statement items is > 0.70 , so it can be concluded that all statement indicators are declared convergently valid, meaning that all indicators are able to explain their respective variables.

b. Average Variance Extracted (AVE)

Measures the average variance captured by the indicators of a construct compared to the variance caused by errors. AVE is used to measure convergent validity. Hair et al. (2019). The AVE value is considered valid if it is ≥ 0.5 .

Table Average Variance Extracted (AVE) Data

Construct	Average Variance Extracted (AVE) Value	Critical Value/Rules of Tumbs	Information
Work Productivity	0.749	≥ 0.5	Valid
Work Commitment	0.740		Valid
Knowledge Sharing	0.841		Valid
Project Leadership	0.834		Valid

Source: SEM-PLS 4 Output Data

Based on table above, it can be seen that the AVE value for the variables Work Productivity, Work Commitment, Knowledge Sharing, and Project Leadership is > 0.5 , which means the results are valid.

c. Discriminant Validity

This value is the cross-loading factor value used to determine whether the construct has adequate discriminant by comparing the loading value on the intended construct compared to the loading value with other constructs. The parameters used in this case are the Fornell-Larcker where the rules of thumb are the root value of AVE $>$ correlation between the construct and other constructs.

Table Discriminant Validity Values

Construct	Knowledge Sharing	Work Commitment	Work Productivity	Project Leadership
Knowledge Sharing	0.917			
Work Commitment	0.740	0.860		
Work Productivity	0.643	0.813	0.866	
Project Leadership	0.170	0.529	0.442	0.913

Source: SEM-PLS 4 Output Data

Based on table above, it can be seen that the AVE root values for each variable are greater than the correlation between constructs and other constructs, so it can be concluded that all variables are declared valid discriminants, which means that each variable has no similarities with other variables.

3.3. Construct Realibility

a. Cronbach's Alpha

Cronbach's alpha (α) is a metric used to determine whether items in a group of instruments (e.g., questionnaires) actually measure the same thing. Sekaran & Bougie (2016). A good Cronbach's Alpha value is greater than ≥ 0.7 .

Table Cronbach's Alpha Value

Construct	Cronbach's Alpha	Critical Value/Rules of Tumbs	Information
<i>Knowledge Sharing</i>	0.937	≥ 0.7	Reliable
<i>Work Commitment</i>	0.883		Reliable
<i>Work Productivity</i>	0.889		Reliable
<i>Project Leadership</i>	0.934		Reliable

Source: SEM-PLS 4 Output Data

Based on the table above, it can be seen that the Cronbach's Alpha value of all tested variables is greater than > 0.7 , so it can be concluded that all variables are declared reliable, meaning that the measuring instrument (questionnaire or indicator) used to measure the variable is able to provide stable, consistent and reliable results, even though the test is carried out repeatedly at different times or to different respondents.

b. Composite Reliability (rho_c)

Composite Reliability is a measure of construct reliability that considers the factor loading value of each indicator, where the permissible value is if it is more than ≥ 0.7 , then it can be declared reliable.

Table Composite Reliability Value (rho_c)

Construct	Composite Reliability (rho_c)	Critical Value/Rules of Tumbs	Information
<i>Knowledge Sharing</i>	0.955	≥ 0.7	Reliable
<i>Work Commitment</i>	0.919		Reliable

Work Productivity	0.923		Reliable
Project Leadership	0.953		Reliable

Source: SEM-PLS 4 Output Data

Based on the table above, it can be seen that the composite reliability (ρ_c) value of all tested variables is greater than > 0.7 , so it can be concluded that all variables are declared reliable. Although both measure reliability (consistency and reliability of measuring instruments), Composite Reliability (ρ_c) is considered more accurate and better than Cronbach's Alpha in PLS-SEM modeling. Cronbach's Alpha assumes that all indicators have the same contribution weight to the variable, in contrast, Composite Reliability calculates the reliability value based on the actual weight (loading factor) of each indicator.

Therefore, the Composite Reliability (ρ_c) value usually produces a slightly higher number, namely > 0.7 and provides a more realistic estimate of the model's reliability.

c. Results Structural Model Evaluation (Inner Model)

Structural Model Evaluation (Inner Model) aims to assess the quality of the relationships between latent variables (constructs) formulated in the research hypothesis. While the Outer Model evaluates the quality of indicators, the Inner Model evaluates whether the relationships between variables in the research model are supported by the data.

d. R-Square

The R-squared (R^2) value, also known as the coefficient of determination, is a statistical metric that measures the extent to which variability in the dependent (endogenous) variable can be explained by the independent (exogenous) variables in a research model. The range of R-squared values includes ≥ 0.75 (strong), ≥ 0.50 (moderate), and ≥ 0.25 (weak).

Table R-Squared (R^2) Value

	R-Square	R-Square Adjusted
Work Commitment	0.715	0.708
Work Productivity	0.666	0.654

Source: SEM-PLS 4 Output Data

Based on table above, the adjusted R-square value of the Work Commitment variable is 0.708, this indicates that the Knowledge Sharing and Project Leadership variables are able to explain the Work Commitment variable by 70.8%, so it can be concluded that the model is considered moderate. For the adjusted R-square value of the Work Productivity variable of 0.654, this indicates that the Knowledge Sharing, Project Leadership, and Work Commitment variables are able to explain the Work Productivity variable by 65.4%, so it can be concluded that the model, namely the influence of Knowledge Sharing and Project Leadership on Work Commitment to influence Work Productivity is considered moderate.

e. F-Square

F-Square (F^2) indicates that the exogenous (independent) variable has a large influence on the endogenous (dependent) variable with the following criteria: ($F^2 \geq 0.02$ = weak, $F^2 \geq 0.15$ = moderate and $F^2 \geq 0.35$ = strong).

Table F-Squared (F^2) Value

	<i>Work Commitment</i>	<i>Work Productivity</i>
<i>Knowledge Sharing</i>	1,530	0.015
<i>Work Commitment</i>		0.418
<i>Work Productivity</i>		
<i>Project Leadership</i>	0.586	0.005

Source: SEM-PLS 4 Output Data

Based on the test results in the table above, the F-square value for all variables has a varying influence on other variables, including:

- The influence of Knowledge Sharing on Work Commitment is 1,530, so it is concluded that the influence of Knowledge Sharing on Work Commitment is considered strong.
- The influence of Knowledge Sharing on Work Productivity is 0.015, so it is concluded that the influence of Knowledge Sharing on Work Productivity is considered weak.

c. The influence of work commitment on work productivity is 0.586, so it is concluded that the influence of work commitment on work productivity is considered strong.

d. The influence of Project Leadership on Work Commitment is 0.418, so it is concluded that the influence of Project Leadership on Work Commitment is considered strong.

e. The influence of Project Leadership on Work Productivity is 0.005, so it is concluded that the influence of Project Leadership on Work Productivity is considered weak.

f. The Influence of Knowledge Sharing on Work Productivity

Based on the results of the hypothesis testing above, the Knowledge Sharing variable on Work Productivity was stated to have no effect.

This aligns with previous research by Febriyanti et al. (2024). Their study on organizational behavior found that knowledge sharing had no significant direct impact on performance. New knowledge can only have an optimal impact if employees possess individual innovation capability as a mediating variable.

Theoretically, knowledge sharing is expected to boost work efficiency and effectiveness. However, in the context of this research, this activity does not directly increase employee productivity.

This phenomenon can occur due to several structural and situational factors in the field, including:

- **Time and Workload Constraints:** Employees are likely to be faced with a busy work routine, so the knowledge transfer process is seen as an additional burden that takes up their prime operational time.
- **Quality of Information Shared:** Knowledge Sharing that is superficial or less relevant to daily technical challenges will not have a transformative impact on employee work output.
- **Absence of Mediating Variables:** The information or knowledge obtained will not be transformed into productivity without other drivers such as intrinsic motivation, a culture of innovation, or adequate infrastructure facilities.

g. The Influence of Project Leadership on Work Productivity

Based on the results of the hypothesis testing above, the Project Leadership variable was declared to have no effect on Work Productivity. A similar study by Suri & Harris (2025) attempted to understand how leadership style and workload affect employee productivity in this particular department, but the results showed that, partially, leadership style and workload did not have a significant effect on employee productivity.

These results indicate that project leadership style, whether directive, transformational or transactional, is not the main factor determining high or low employee work productivity.

h. The Influence of Knowledge Sharing on Work Commitment

Based on the results of the hypothesis testing above, the Knowledge Sharing variable has a significant positive effect on Work Commitment. These results are also in line with research by Ahyar Yuniawan (2020), which shows that a culture of knowledge sharing not only improves individual capabilities but also contributes directly to strengthening employees' normative and affective commitment to the organization. This indicates that when employees have access to broader knowledge, they are better able to meet organizational expectations and, as a result, feel more emotionally and normatively connected. In other words, there is a strong and important relationship between knowledge sharing practices within the organization and the level of employee attachment to their current workplace. This confirms that the process of sharing information, expertise, and experience between employees is not merely a routine activity, but a fundamental element that contributes to the development of Work Commitment, especially in electricity network construction activities in rural areas that are prone to geographical constraints.

This phenomenon can be explained through various relevant theories and perspectives in organizational studies. First, Social Exchange Theory, which states that relationships between individuals in organizations are built on mutually beneficial exchanges. In this context, when employees feel that their information and knowledge are valued and shared, they tend to feel more strongly committed to the organization. Openness in sharing knowledge creates a positive work climate, which in turn increases affective commitment—that is, employees' emotional attachment to the organization.

A collaborative work environment is created when an organization facilitates the exchange of knowledge. Employees don't feel isolated. They feel supported by their colleagues and superiors, creating a sense of comfort and increasing loyalty.

i. The Influence of Project Leadership on Work Commitment

Based on the results of the hypothesis testing above, the Project Leadership variable has a significant positive effect on Work Commitment. This is in line with research showing that transformational leadership can improve organizational commitment and employee performance (Mohammed et al., 2023). In this context, Project Leadership not only functions as a project director but also as a role model capable of motivating and inspiring the team to achieve common goals, including ensuring the successful completion of network construction for non-electrified villages and immediate community utilization.

A positive relationship direction indicates that the more effective and professional the project leadership implemented by a manager, the higher the Work Commitment shown by team members in completing the project.

Project Leadership plays an important role in creating a supportive work environment, which in turn influences employee Work Commitment.

j. The Influence of Work Commitment on Work Productivity

Based on the results of the hypothesis testing above, the variable Work Commitment on Work Productivity was found to have a significant positive effect. These findings provide a new contribution to the literature on the relationship between Work Commitment and Work Productivity in the context of village electricity network development projects.

Previous research also shows that work commitment is a crucial factor in improving individual performance within an organization (Iqbal et al., 2021). This aligns with findings that when individuals feel committed to an organization, they tend to perform better (Mohammed et al., 2023). In the context of this study, work commitment serves as a bridge connecting the positive effects of knowledge sharing and project leadership on work productivity.

Furthermore, with Work Commitment, individuals in a village electricity network development project are able to collaborate better in sharing knowledge, which in turn increases their Work Productivity. Research by Nasir et al. (2022) underscores the importance of transformational leadership in creating a work environment that supports Work Commitment, thereby improving team performance. Thus, the results of this study provide empirical evidence that Work Commitment is not merely a variable in a research model but also a substantial factor in influencing Work Productivity.

In this study, the intervening variable Work Commitment demonstrates its relevance in the context of complex development projects, where collaboration and knowledge sharing are essential to achieving shared goals. These findings not only enhance our understanding of work dynamics within projects but also provide practical guidance for project managers in utilizing Work Commitment as a tool to enhance productivity.

4. Conclusion

This study aims to analyze and test the influence of Knowledge Sharing and Project Leadership on Work Productivity and also Work Commitment which is a mediating variable on Work Productivity in the village electricity development project at PLN UP2K Kaltim.

Based on the discussion of the results of the hypothesis test conducted through a quantitative approach with the explanatory research method processed through SEM-PLS, it can be concluded that:

1. *Knowledge Sharing* has a significant positive effect on Work Commitment, where these results strengthen the argument that effective knowledge exchange among team members can increase their sense of commitment to their work and organization. These results underscore the importance of knowledge-sharing practices within organizations as a strategy for increasing employee commitment. By creating an environment that supports the exchange of information and experiences, organizations can increase employee engagement and loyalty to company goals. A significant contribution of this thesis lies in developing an understanding of the relationship between knowledge sharing and work commitment, which was previously limited in the literature. This research provides empirical evidence that increased knowledge sharing can contribute to increased employee commitment, which in turn can positively impact organizational performance. These findings provide a reference for managers in designing programs that encourage collaboration and information sharing among employees.
2. *Project Leadership* Work commitment also has a significant positive impact. This demonstrates the importance of good leadership in leading a project. Good leadership and being a role model for employees will certainly motivate and engage team members, thus maintaining strong work commitment to completing each task.
3. *Knowledge Sharing* The analysis and discussion of the effect of Knowledge Sharing on Work Productivity show that the effect of Knowledge Sharing on Work Productivity does not have a significant positive effect. This finding challenges the initial hypothesis that increased Knowledge Sharing in the workplace will directly increase employee productivity. Although many previous studies support a positive relationship between the two variables, the results obtained in this study indicate that other factors, such as organizational culture, individual motivation, and reward systems, may have a greater influence on Work Productivity. The significant contribution of this thesis lies in a deeper understanding of the complexity of the relationship between Knowledge Sharing and productivity, as well as identifying moderating variables that may influence the relationship. Evaluation of the research hypothesis shows that the initial hypothesis stating a positive influence of Knowledge Sharing on Work Productivity is proven to be inconsistent based on the results obtained in this study in the village electricity network

development project sector. The implications of this finding are crucial for human resource management and organizational development, as they demonstrate the need for a more holistic approach to improving employee productivity. Organizations need to consider broader contextual factors and not just focus on Knowledge Sharing mechanisms as a single strategy to improve work performance.

4. *Project Leadership* The study's findings on work productivity showed no significant positive effect. These results indicate that although project leadership plays an important role in management, other factors that may be more dominant in influencing work productivity in the organizational environment studied need to be identified and explored further. This thesis' significant contribution lies in its analysis of the relationship between leadership and work productivity, which has been considered linear and positive in the literature. The results provide a new perspective that can create a deeper discussion regarding the complex nature of leadership and its impact on work productivity, which in turn impacts team performance. This thesis emphasizes that managerial strategies cannot solely rely on the leadership style applied, but must consider various other factors such as organizational culture, individual motivation, team dynamics, and the conditions of the work location.
5. *Work Commitment* proven to have a significant positive effect on Work Productivity. These results indicate that Work Commitment has a significant positive effect on Work Productivity. This finding confirms the importance of psychological factors in an organizational context, where individuals with high commitment tend to demonstrate better performance. Through in-depth analysis, it was understood that increasing Work Commitment can be pursued through various managerial interventions, thereby impacting the overall efficiency and effectiveness of the organization. This thesis's significant contribution to the fields of human resource management and organizational psychology lies in identifying a direct relationship between work commitment and productivity. These findings enrich the existing literature by providing empirical evidence supporting existing theories. Thus, the results of this study not only provide insights for practitioners in formulating human resource development strategies but also add to the academic literature on the relationship between psychosocial factors and work outcomes.

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