The Implementation of Knowledge Management System (KMS) Evaluation Model in Improving Employee Performance: A Case Study of the State Electricity Company

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Abstract - Employee performance has a crucial role in running a company. Thus, efforts to improve employee performance are vital to be conducted and evaluated. The research aimed to assess the Knowledge Management System (KMS) evaluation model implemented at PT Perusahaan Listrik Negara (PLN) (Persero), a state electricity company, and found the factors and indicators to improve employee performance. The research applied a survey that collected data through a summative evaluation by using a questionnaire. The population in the research was 100 employees in PT PLN (Persero). The sampling technique was a probability, namely purposive sampling. Then, the results were examined using the SPSS program to measure the relationship of the variables under study. The collected data were also analyzed quantitatively using descriptive and inferential statistics. The analysis results show that people, process, and technology positively affect employee performance. Thus, based on the results, it can be concluded that the three main elements of KMS have a positive impact on the performance of the employees of PT PLN (Persero). It is suggested that the company takes care of their people, process, and technology to improve its performance considering the findings. It is expected that the management of PT PLN (Persero) can develop and optimize the factors that affect employee performance in using KMS for sustainable company decisions.

Keywords: Knowledge Management System (KMS), employee performance, factor analysis

I. INTRODUCTION

Business is an organizational activity or company selling goods or services to the community or other companies. It aims to earn profits in the form of the production of goods and services in their daily activities (Haigh & Hoffman, 2012). Meanwhile, Knowledge Management System (KMS) is an application commonly used by companies to facilitate the preparation and management of documentation owned by each employee (Bolhassan, 2018).

The research chooses PT Perusahaan Listrik Negara (PLN) (Persero), a state electricity company, as the subject of research. Since 1994, the status of PLN (Persero) has been transitioned, which was previously a public company to a limited liability company and PKUK (The holder of a power of attorney for electricity) in providing electricity availability for the general public's benefit. PT PLN (Persero) has expanded the business sector by having 11 subsidiaries that year (Divisi IT, n.d.). Likewise, PT PLN (Persero) carries out business processes in electricity for the Indonesian people's needs because of the existence of knowledge management (Sardjono, Sudrajat, Retnowardhani, & Mariani, 2020). Employees can also access information relating to business competition and others to make it easier and faster.

However, based on the data, there is still a gap in realizing the employee performance in PT PLN (Persero). It can be seen from the achievement of the performance realization target in 2014 with 400. The target was realized at 300, so there was a gap of 100 in 2015. Still, the target was realized, amounting to 340,

with a gap of 60 in 2016. Moreover, the target reached 300 with a gap of 100 in 2017. Then, in 2018, the realization was 250 with a gap of 150 (Basir, 2017).

The KMS approach can capture employees' knowledge and experience, which can be stored for the company's benefit. Then, it can be distributed to other employees to maintain a balance of knowledge (Mårtensson, 2000). Thus, the knowledge distribution evaluation in Human Capital Management Systems Division is the place for knowledge management to be implemented in PT PLN (Persero).

An evaluation is needed to analyze employees' knowledge management process with KMS. Hence, the implementation of the knowledge sharing process that has been running at PT PLN (Persero) can be carried out optimally. It aims to change tacit knowledge into explicit knowledge that is useful for each employee. The implementation of knowledge must be implemented effectively to increase employee performance. Then, their knowledge can be evaluated very well, so it is expected to provide benefits to the company. Thus, the research objective is to find the factors that can improve employee performance and indicators to influence employee performance by using KMS in PT PLN (Persero).

II. METHODS

The research applies a survey method. Researchers use a questionnaire to collect data from employees. Then, the results are analysed using the SPSS program to measure the relationship of the studied variables. The research also applies a summative evaluation method using quantitative data. Descriptive statistical analysis is carried out to describe the data and relate it to the research phenomenon. Meanwhile, inferential statistics are used to measure the relationship between variables.

Based on the employment data of PT PLN (Persero), the population of the selected employees at PT PLN (Persero) is 100. It only consists of permanent employees. It does not include employees with shifts during their working hours. The sampling technique is a probability, namely purposive sampling. According to Sugiyono (2016), the main objective is those who are considered to know best about what researchers expect. The following data collection technique is designing a questionnaire which will be distributed to all employees of the Human Capital Management Systems Division of PT PLN (Persero). The statements used in the questionnaire refer to a literature study on the concept of knowledge management.

The data analysis process is carried out in various stages, starting with a questionnaire on the research sample to test the research variables' validity and reliability. It is to see whether the questionnaire items are suitable for the research or not. Kaiser-Meyer-Olkin (KMO) and Barlett tests test whether the research sample is worthy of further analysis by showing the correlation of each variable. In conducting factor analysis, the analyzed variables are said to be

feasible to be factored in if the KMO-MSA value is > 0,5 and the significant value (sig.) or probability (p) < 0,05. Then, hypothesis testing with simultaneous and partial testing and determination coefficient test with the help of the SPSS program (Kristin & Sardjono, 2013).

The people, process, and technology factors are further reduced into several dimensions based on organizational performance and change (Burke & Litwin, 1992). According to Lumbantobing (2011), the organizational performance and change model based on Burke and Litwin (1992) is a model that can ensure harmony and synergy between all dimensions of the organization and make changes. Then, each factor has several indicators (see Table 1). Based on that, the hypotheses proposed are as follows.

H1:   People and knowledge affect the performance of the employee positively

H2:   The process of using KMS has a positive effect on employee performance

H3:   Technology has a positive effect on performance

III. RESULTS AND DISCUSSIONS

The research uses primary data by indirectly filling the invitation link via corporate or personal email by the Human Capital Management System Division in the Knowledge Management Division to 100 selected employees at PT PLN (Persero). Table 2 shows the distribution of the analyzed questionnaire data. Based on Table 2, all respondents respond to the questionnaire so that the researchers can process the data.

Next, validity and reliability tests are conducted. Based on Table 3, on the people, process, and technology questions, each question has a significant value above the standard of 0,5. It can be concluded that each question is valid and can be continued for the reliability test.

A reliability test can only be done after an instrument has confirmed its validity. The reliability test measures Cronbach's alpha coefficient. The alpha value varies from 0 to 1. A question can be categorized as reliable if the alpha value is greater than 0,60 (Sitepu & Putri, 2019). The results of the reliability test are summarized in Table 4. The Cronbach's alpha coefficient value for the people is 0,941. Meanwhile, the values for process and technology are 0,900 and 0,936, respectively. In addition, the employee performance has a value of 0,942. These values prove that the variables have good reliability because they are above the Cronbach's alpha standard of 0,60.

Next, Kaiser-Meyer-Olkin Measure for Sampling Adequacy (KMO-MSA) is conducted to test whether the study sample is feasible for further analysis or not by showing the correlation of each variable. In conducting factor analysis, the analyzed variables are said to be feasible to factor if the KMO-MSA value is more than 0,5 and the significant value

Table 1 The Research Variables and Indicators

Factor	Indicator	Statement	Reference
People	Communication	Employees always share knowledge with colleagues who carry out the same task in the same field.	(Sofiati, 2014)
	Employee role	Employees invite colleagues to use KMS.	(Kristin & Sardjono, 2013).
	Training	Employees receive training on how to use KMS.	(Tien, 2017)
	The reward for sharing knowledge	The company provides rewards for every employee who shares knowledge.	(Afifah, Andrawina, & Kurniawati, 2011)
	The ability of employees to access KMS	Employees can access KMS without trouble anywhere.	(Darudiato & Setiawan, 2013)
Process	Knowledge creation	Employees get a lot of knowledge and information through the KMS portal.	(Husin, 2017)
	Knowledge store	KMS records all problems that occur when employees use it and their solutions.	(Igbinovia & Ikenwe, 2017)
	Knowledge retention	Technology always updates the knowledge contained in the KMS periodically.	(Bairi, Murali Manohar, & Kundu, 2011)
	Knowledge sharing	Fellow employees can share using KMS about problems that occur along with their solutions.	(Murad, Wandanaya, Saputra, & Tarmizi, 2018)
	Knowledge utilization	Information and knowledge obtained from KMS can improve employee performance.	(Puryantini, Arfati, & Tjahjadi, 2017)
	Work accuracy	Employees enter their knowledge into KMS without errors and are easy to understand.	(Maria, 2017)
Technology	Quality of KM features and content	The language used by KMS is easy for employees to understand.	(McCuiston & Jamrog, 2005)
	Complexity barriers	Employees can use KMS easily.	(Maflikhah, 2010)
	Creativity	KMS helps in increasing employees' creativity.	(Kosasih & Budiani, 2007)
	Cost and time reduction	KMS reduces the costs and time required.	(Nurpratama, 2016)
	Building knowledge	KMS helps to increase knowledge.	(Assegaff, Hussin, & Dahlan, 2012)
	Effectiveness	KMS helps to increase employees' effectiveness.	(Tarigan, Haerudin, Widjaja, & Hery, 2017)

(Source: Researchers' Analysis, 2020)

Table 2 List of Responses

No.	Response Data	Total	Response Rate
1	Distributed questionnaires	100	100
2	Not returned questionnaires	0	0
3	Incomplete questionnaire	0	0
	Total Processable Questionnaires	100	100

(Source: Researchers' Analysis, 2020)

Table 3 The Summary of Validity Tests

No.	Variable	R-Count	R-Table	Description
1	People	0,86	0,20	Valid
2	Process	0,80	0,20	Valid
3	Technology	0,88	0,20	Valid
4	Employee	0,88	0,20	Valid

(Source: Researchers' Analysis, 2020)

Table 4 The Summary of Reliability Test

No.	Variable	Cronbach's Alpha Coefficient	Minimum Limit Value	Description
1	People	0,941	0,60	Reliable
2	Process	0,900	0,60	Reliable
3	Technology	0,936	0,60	Reliable
4	Employee Performance	0,942	0,60	Reliable

(Source: Researchers' Analysis, 2020)

Table 5 The KMO and Barlett Test Results

Name		Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,812
Bartlett's Test of Sphericity	Approx. Chi-Square	1.611,639
	df	153
	Sig.	0,000

(Source: Researchers' Analysis, 2020)

(sig.) or opportunity (p) is less than 0,05 (Hidayati, 2014). Based on Table 5, the KMO value is 0,812 or more than 0,5. Then, Bartlett's test for sphericity value is 1.611,639 and a probability (p) of 0,00 at significant with less than 0,05. It indicates that the data have significantly met the requirements for factor analysis.

Based on the factor rotation test, it shows 18 question items which are significantly divided into 4 factors with all factor loading above 0,5. The division of these factors includes P1–P6 in the Factor 1 component with the name of people, R1–R6 in the Factor 2 component with the name of a process, T1–T2 in Factor 4 component with the name of technology, and K1–K4 in the Factor 3 component with the name of the employee performance. Factor analysis also shows the results of the validity test. All items have a loading factor value of more than 0,50. It indicates that all statements are declared valid. Table 6 shows the result.

Then, the R^2 test is carried out to determine how the model can explain variations in the dependent variable. The researchers use the adjusted R^2 value to determine the coefficient of determination. From the R^2 test results in Table 7, the adjusted R^2 value is 0,340, or 34%. The result shows that 34% of employee performance can be explained by KMS factors (people, process, and technology). Meanwhile, other variables explain the remaining 66%.

The F test is known as the simultaneous model test or ANOVA test. It is a test to see how all independent variables affect the dependent variable. It also tests whether the regression model is good/significant or not good/insignificant. If the model is substantial, the model can be used for prediction/forecasting. On the other hand, if it is not significant,

the regression model cannot be used for forecasting. F test can be done by comparing the calculated F with the F table in Excel. Suppose the F count is bigger than the F table (Ho is rejected, Ha is accepted). In that case, the model is significant, or the significance column in ANOVA can be seen (processed with SPSS, use regression test with entry or full model method) (Hidayat, 2013). The results of the F test can be seen in Table 8. The simultaneous f-test results are 16,453. The probability value is 0,000 or less than 0,05. It indicates that people, process, and technology affect employee performance simultaneously, positively, and significantly.

Based on Table 9, the results of the regression coefficient between people and employee performance are 0,279. If each increase in people factor by 1 unit with the assumption that other variables are constant, employee performance will increase by 0,279. The t-test result is 3,207, and the probability value is 0,002 or less than 0,05. The factor of people affects employee performance positively and significantly. Based on the results of the partial t-test, it shows that H1, which states that people have a positive impact on employee performance, is accepted. The results also indicate that knowledge management influences the employee's assessment of the people factor and performance. The key to success in knowledge management can give people visibility and recognition that they are an expert in their field and utilize their successful business expertise. The results align with Nurpratama (2016), stating that effect of people on employee performance.

Next, the regression coefficient between process and employee performance is 0,392. Each increase in the process by 1 unit, assuming that other variables are constant, will increase employee performance by

Table 6 Rotated Component Matrixa

	Component			
	1	2	3	4
P1	0,869			
P2	0,857			
P3	0,883			
P4	0,869			
P5	0,837			
P6	0,865			
R1		0,810		
R2		0,818		
R3		0,840		
R4		0,823		
R5		0,782		
R6		0,712		
T1				0,921
T2				0,830
K1			0,874	
K2			0,830	
K3			0,898	
K4			0,908	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation is converged in 6 iterations.

Table 7 The Summary of R-Squared Test Results

Model	R	R-Squared	Adjusted R-Squared	Std. Error of Estimate
1	0,583[a]	0,340	0,319	0,57358

(Source: Researchers' Analysis, 2020)

Table 8 Simultaneous F-Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16,239	3	5,413	16,453	0,000[b]
	Residual	31,584	96	0,329		
	Total	47,823	99			

a. Dependent Variable: Employee Performance
b. Predictors: (Constant), Technology, Process, People

(Source: Processed SPSS Results, 2020)

Table 9 The Results of the Partial T-Test Coefficient

Model B		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	0,250	0,555		0,451	0,653
	People	0,279	0,087	0,284	3,207	0,002
	Process	0,392	0,092	0,364	4,263	0,000
	Technology	0,333	0,074	0,389	4,506	0,000

a. Dependent Variable: Employee Performance

(Source: Processed SPSS Results, 2020)

0,392. The t-test result is 4,263, and the probability value is 0,000, less than 0,05. The partial t-test results show that H2 is accepted. It indicates that the process affects employee performance positively and significantly.

The process is the responsibilities or tasks that are formal in nature or legal orders. A concrete example of a work procedure is the Standard Operating Procedure (SOP). SOP is made and implemented to ensure that the work results are in accordance with the expected standards. In addition, SOP can also be a guide in carrying out tasks so that task implementation becomes more effective and efficient. Employees in every field, starting from the general division, finance, and even in the arrangement field, have their SOP compiled based on the company's objectives. Employees who can understand the SOP well can do their work easier. It means that SOP makes a significant contribution to employee performance. The research results support research by Arilaha and Nurfadillah (2018), suggesting the positive effect of the process on employee performance.

In addition, the regression coefficient between technology and employee performance is 0,333. If each increase in technology is 1 unit by assuming that other variables are constant, employee performance will increase by 0,333. The t-test result is 4,506, and the probability value is 0,000, less than 0,05. Then, based on the partial t-test result, H3, which states that technology positively affects employee performance, is accepted. It implies that technology affects employee performance positively and significantly.

Technology is very influential in carrying out the employees' daily work. In detail, it can be explained based on the descriptions of respondents' answers that the Internet is a tool used by employees to help their work, especially for employees in the environmental management field. One of the things needed is technology or currently known as the Internet, to design an excellent environmental arrangement. Technology makes a substantial contribution to the sustainability of the company. Employees' ease of access to the Internet can improve their performance. The ease of use of the Internet is very helpful for employees in doing their jobs. The research results are in line with the research of Arilaha and Nurfadillah (2018), suggesting the positive effect of technology on employee performance.

Tables 10 show that the process has several indicators: knowledge creation, knowledge storage, knowledge retention, knowledge sharing, knowledge utilization, and work accuracy. Knowledge storage and work accuracy have the highest frequency among other indicators with 76% and 76,80%. These factors show that most respondents stated that fellow employees could share through KMS about problems that occur along with their solutions. Employees enter their knowledge into KMS without errors and are easy to understand.

Based on Table 11, there are several indicators of the people factor. It has employees' roles, communication, training, rewards for sharing knowledge, and the ability to access KMS. Training and ability to access KMS have the highest frequency among the others, with 80,60% and 80,20%. Most respondents agree that they have received training in using KMS and can access KMS without difficulty everywhere.

Based on Table 12, technology has several indicators: quality features and KM content and complexity barriers. The two indicators have a frequency of 75,20% and 71,60%, respectively. It means that most respondents can easily understand the language used by KMS and use KMS.

The increase in the use of KMS as a space for sharing knowledge and experiences for each employee is essential. The research results indicate that the factor that most influences employee performance is people. The role of the people in the company is significant if the entrepreneurs do not directly share their knowledge and experiences using KMS. Hence, useful and effective information based on data and knowledge that are continuously developed and enriched with employees' experiences can reduce existing problems.

Moreover, the quality of KMS, including data and information that is always up to date, can influence employees to share knowledge and experiences with other employees. Thanks to the quality of KMS, users

Table 10 The Test Results of Process Indicators

Factor	Indicator	Statement	Percentage (%)
Process	Knowledge creation	Employees get knowledge and information through the KMS portal	75,30
	Knowledge storage	KMS records all the problems that occur when employees use KMS and the solutions	76
	Knowledge retention	The information technology division always updates the knowledge contained in KMS regularly	74,80
	Knowledge sharing	Fellow employees can share knowledge through the use of KMS about the problems that occur and their solution	74,80
	Knowledge utilization	Information and knowledge obtained from KMS can improve employee performance	74,20
	Accuracy of work	Employees enter the knowledge they have into KMS without error, and it is easy to understand	76,80

(Source: Processed SPSS Results, 2020)

Table 11 The Test Results of People Indicators

Factor	Indicator	Statement	Percentage (%)
People	Employees' roles	Employees invite colleagues to use KMS	78,40
	Communication	Employees always share knowledge with colleagues who carry out the same tasks in one field	79,20
		Employees in my division always share knowledge with colleagues and implementing units	79,00
	Training	Employees receive training on how to use KMS	80,60
	Rewards for sharing knowledge	The company provides rewards for every employee who shares knowledge	79
	Employees' ability to access KMS	Employees can access KMS without difficulty everywhere	80,20

(Source: Processed SPSS Results, 2020)

Table 12 The Test Results of Technology Indicators

Factor	Indicator	Statement	Percentage (%)
Technology	Quality features and content of knowledge management (KM)	The language used by KMS is easy for employees to understand	75,20
	Complexity barriers	Employees can use KMS easily	71,60

(Source: Research Results, 2020)

can get more useful information and knowledge to support company innovation. In addition, real-time information transmission and dissemination make the sharing process effective and efficient. The existence of supporting facilities for information technology is also crucial in implementing KMS. The implementation of KMS cannot happen if human resources only support it.

The company needs to pay attention to several things from the results so that the KMS can run well. It should see the importance of support from top-level management to motivate employees to use this KMS correctly and support and policies from top-level management to increase employees' awareness about the importance of sharing knowledge. Those factors can increase employees and the company's potential. The company can also give special awards to employees who are active in using the KMS and provide special training for all employees to use the KMS correctly. Then, along with its development, the current pandemic conditions and the company's needs will continue to change. In further system development, the KMS can be added to other facilities to meet the company's needs and integrated with the Identity and Access Management (IAM) application.

IV. CONCLUSIONS

The KMS analysis has been carried out on employee performance at PT PLN (Persero). Based on the analysis conducted, several problems are found. Then, after testing the KMS evaluation model, the conclusions drawn are as follows. First, the factors that can increase employee performance using the KMS at PT PLN (Persero) include people, process, and technology. Second, some indicators can improve employee performance using the KMS at PT PLN (Persero). People factor consists of employee roles, communication, training, knowledge sharing rewards, and employees' ability to access KMS. Then, the process has knowledge creation, knowledge storage, knowledge retention, knowledge sharing, knowledge utilization, and work accuracy. Meanwhile, technology has quality features and KM content and complexity barriers.

Based on the research, there are several implications. First, selecting the right factors is necessary and important to support the improvement of KMS in PT PLN (Persero). Various influencing indicators have a major impact on employee performance in using KMS. Factors that can influence and improve employee performance in using the KMS that needs to be optimized are people, process, and technology. The management of these factors needs to be controlled and managed properly by PT PLN (Persero). Second, indicators that can improve employee performance to use KMS are people factors with employees' role, communication, training, knowledge sharing rewards, and the ability to access KMS. In terms of the process, it has knowledge

creation, knowledge storage, knowledge retention, knowledge sharing, knowledge utilization, and work accuracy. The technology consists of quality features and KM content and complexity barriers. It is hoped that the management of PT PLN (Persero) can grow and optimize the factors that affect employee performance in using KMS for sustainable company decisions.

From the conclusions, companies need to pay attention to several things so that this knowledge management system can run well. However, several things need to be considered by the company. It is recommended that the leaders in PT PLN (Persero) pay attention to the research conclusions and review each policy. It is to realize the formation of human resources who understand the importance of implementing knowledge management as a form of initiative from each head office employee so that togetherness can be imitated. Then, the role of employees in managing knowledge and information can improve the quality of human resources for project clients and the operational needs of all levels of employees who are members of PT PLN (Persero).

There are two limitations to the research. First, it only examines the factors influencing employee performance in using or implementing the KMS in PT PLN (Persero). Second, the studied population are all employees of PT PLN (Persero). It does not extend to other variables and objects outside of the research. It is expected that the research will not stop here. However, the results cannot be generalized. Therefore, many things must be developed and understood from knowledge management. The research results can be a reference for further research in revealing the meaning of knowledge management strategies. Future research can study phenomena in organizations, especially human resource behavior in organizations, towards understanding knowledge management. Hence, there will be a continuation of evaluation that can develop activities from the research to help achieve results and decisions.

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