

# Design and Implementation Public Transport Company Safety Management System and the Influence on Employee Productivity

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**Abstract:-** PT Krakatau Argo Logistics is a multimodal logistics transportation company that uses land, sea and air transportation modes. In 2020 at PT Krakatau Argo Logistics there were still accidents and incidents that disrupted operational processes and suffered material losses, so work productivity could decrease. Therefore, the purpose of this study is to see the effect of the implementation of the safety management system of public transport companies with employee productivity. The research method used is multiple linear regression, t test, f test and coefficient of determination ( $R^2$ ). The results of the study obtained a significance value of  $0.000 < 0.05$  and a t-count value of  $6.182 > 2.005$  t-table, so it can be said that the implementation factor of SMKPAU affects work productivity and fcount  $14,998 > 2.54$  f table and a significance value of  $0.000 < 0.05$ , so it can be said that work productivity can be significantly affected by the independent variables of SMKPAU implementation, age, education level and years of service. And the value of R Square obtained is 0.531, this can be interpreted that the effect of variable X simultaneously on variable Y is 53.1%.

logistics there were still accidents and incidents that resulted in disruption of operational processes and material losses, so work productivity could decrease. PT Krakatau Argo Logistics is also not optimal and has not been certified by the safety management system of public transportation companies as a guide for safety systems in terms of transportation. This has been done by previous research by Purwati [4], namely about the effect of implementing an occupational health and safety management system on employee productivity.

So that researchers are interested in conducting research on the design of the safety management system of public transportation companies (SMKPAU) and knowing the effect of implementing the safety management system of public transportation companies (SMKPAU) on employee work productivity. The purpose of this study was to determine the design of the safety management system of public transportation companies at PT. Krakatau Argo Logistics and analyze the effect of the implementation of the safety management system of public transport companies (SMKPAU) on employee productivity.

## I. INTRODUCTION

In 2018 the government issued a new regulation to regulate safety governance in public transport companies. The regulation is the Regulation of the Minister of Transportation of the Republic of Indonesia No. 85 of 2018 concerning "Safety Management System for Public Transport Companies". In the safety management system of public transportation companies, there are 10 elements that must be made, implemented and perfected by the company. The 10 elements of a public transport company's SMK include commitment and policy, organization, hazard and risk management, motor vehicle maintenance and repair facilities, documentation and data, competency improvement and training, emergency response, internal accident reporting, monitoring and evaluation and measurement of management system performance. safety [2].

PT Krakatau Argo Logistics is a multimodal logistics transportation company that uses land, sea and air transportation modes. In Delivery activities or related to transportation, there are several departments/divisions that are in direct contact which consist of logistics service, stevedoring, internal transportation and safety. In 2020 at PT Krakatau Argo Lo-

## II. LITERATURE REVIEW

### 2.1 Public Transport Company Safety Management System (SMKPAU)

The Public Transportation Company Safety Management System (SMKPAU) is something different from the Occupational Health and Safety Management System (SMK3) because the Public Transportation Company Safety Management System is part of the company management in the form of a safety management carried out by the Public Transportation Company in a comprehensive and coordinated manner in order to realize safety and manage accident risk [2].

The safety management system of public transport companies is part of company management in the form of a safety management carried out by public transport companies in a comprehensive and coordinated manner in order to realize safety and manage accident risk [2].

The safety management system of public transportation companies is structured systematically using the PDCA (Plan-Do-Check-Action) approach which consists of 10 main elements equipped with the desired implementation expecta-

tions in accordance with the company's transportation safety needs. Based on Permenhub no. 85 of 2018 article 5, the safety management system of public transport companies includes:

- a. Commitments and policies;
- b. Organization;
- c. Hazard and risk management;
- d. Motor vehicle maintenance and repair facilities;
- e. Documentation and data;
- f. Enhancement of competence and training;
- g. Emergency response;
- h. Internal accident reporting;
- i. Monitoring and evaluation; and
- j. Performance measurement.

Based on Permenhub no. 85 of 2018 article 4 paragraph 1, namely Public Transportation Companies are required to create, implement, and improve the Safety Management System of Public Transportation Companies based on the National General Plan for Traffic and Road Transportation Safety (RUNK LLAJ). The Management System of the Public Transportation Company as referred to in Article 4 paragraph 1 is made within a maximum of 3 (three) months after the permit for the operation of public transportation is granted and reported to the licensee for the operation of public transportation in accordance with its authority. The process of the Safety Management System as follows:

- a. The Safety Management System begins with the establishment of a written safety policy as a form of management commitment and leadership.
- b. The next process is the planning process which begins with the identification of hazards that exist within the company that must be controlled and managed so that unwanted events can be avoided.
- c. Determine the organization of all necessary resources.
- d. The implementation phase includes the development of human resources and competencies, communication and consultation as well as controlling transportation operations including emergency response.
- e. The results of the implementation are monitored and measured periodically to ensure that the targets have been achieved.
- f. If there are deviations, management immediately conducts a review to then determine corrective steps.

## 2.2 Validity test

Validity is a measure that shows the levels of validity or validity of an instrument. Validity shows the extent to which a measuring instrument is able to measure what it wants to measure. The validity test on a questionnaire is said to be valid if the questions on the questionnaire are able to reveal something that will be measured by the questionnaire. The method used to measure validity is to correlate the score of the questions with the total score of the construct or variable. The significance test is carried out by comparing the calculated  $r$  with the  $r$  table, the indicator is declared valid and vice versa if the  $r$  table is smaller than the calculated  $r$ , then the indicator is declared invalid [8]. According to Umar in Riestiany [5], to calculate the correlation analysis used the formula:

$$r = \frac{n \sum xy - (\sum x)(\sum y)}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}} \quad (1)$$

Information:

$r$  : correlation coefficient

$n$  : sample size

$Y$  : variable is not free

$X$  : independent variable

## 2.3 Reliability Test

According to Arikunto in Tarigan [8], reliability is a term used to indicate the extent to which a measurement result is relatively consistent if the measurement is repeated two or more times. A questionnaire is said to be reliable or reliable if a person's answer to a question is consistent or stable over time [8].

According to Tarigan [8], the technique for measuring instrument reliability using a Likert scale can use the Cronbach Alpha reliability coefficient formula. The formula used in this technique is:

$$r_{11} = \left[ \frac{k}{k-1} \right] \left[ 1 - \frac{\sum \sigma b^2}{\sigma t^2} \right] \quad (2)$$

where :

$n$  : number of samples

$X$  : the value of the selected score

: number of item variance

$k$  : number of questions

$r_{11}$  : instrument reliability coefficient

## 2.4 Normality test

The Kolmogorov-Smirnov test is a curve fitting test (Goodness of Fit Test) for general data distribution. This test was first introduced by a Soviet mathematician named Andrei Nikolaevich Kolmogorov in 1933. Another Soviet mathematician who contributed to Kolmogorov's findings was Nikolai Vasil'yevich Smirnov so that this test statistic is known as the Kolmogorov Smirnov statistic [3].

The principle of the normality test using the Kolmogorov-Smirnov is to find the largest deviation ( $D$ ) from the cumulative distribution function of the observation data (empirical) to the theoretical cumulative distribution function. If the maximum deviation formed is not too large, then the observation data can be categorized as normally distributed. Conversely, if the maximum deviation formed is very large, the observation data is said to be not normally distributed [3].

## 2.5 Multicollinearity Test

Multicollinearity test was conducted to determine whether the independent variables tested were truly independent. The method used is to calculate tolerance and VIF (variant inflation factor). If it is known that the tolerance value is close to 1, it can be said that there is no significant effect between the independent variables. Likewise with the value of VIF (variant inflation factor), it turns out that the value of VIF (variant inflation factor) obtained is  $< 10$ , so it can be said that there is no multicollinearity between the independent variables [7].

2.6 Multiple linear regression

Regression analysis is a procedure where through the formulation of a mathematical equation, it is predicted that the value of the random variable continues based on the value of other known quantitative variables. Where the independent variables are the implementation of SMKPAU (X1), age (X2), education level (X3) and years of service (X4), in realizing the dependent variable, namely work productivity, a multiple regression equation will be used where the equation is formulated as follows [4] :

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e \quad (3)$$

Information :

Y = Work Productivity

a = Constant Value

b1..b2 = Regression Coefficient

X1 = Implementation of SMKPAU

X2 = Age

X3 = Education Level

X4 = Working Period

e = Error

2.7 t test

The t test is done by comparing the value of t count with t table. Where if the value of sig < 0.05 or t arithmetic > t table then there is an effect of variable X on variable Y, whereas if the value of sig > 0.05 or t count < t table then there is no effect of variable X on variable Y

2.8 f test

The f test is performed by comparing the calculated F value with the table F value. Where if the value of sig < 0.05 or F count > F table then there is a simultaneous effect of variable X on variable Y. Meanwhile, if sig value > 0.05 or F count < F table then there is no effect of variable X simultaneously on variable Y.

2.9 Coefficient of Determination (R2)

The coefficient of determination (R<sup>2</sup>) is used to determine the percentage of independent variables that together can explain the dependent variable. The value of the coefficient of determination is between zero and one. If the coefficient of determination (R<sup>2</sup>) = 1, it means that the independent variable provides all the information needed to predict the variation of the dependent variable. If the coefficient of determination (R<sup>2</sup>) = 0, it means that the independent variable is not able to explain the dependent variations [1].

III. METHODOLOGY

This research was conducted at PT. Krakatau Argo Logistics. In this study, the design of the safety management system of public transport companies (SMKPAU) was carried out and data was collected using a questionnaire to determine the effect of the implementation of the safety management system of public transport companies (SMKPAU) on work productivity at PT. Krakatau Argo Logistics.

Collecting data on supporting documents for SMKPAU. Researchers conduct a self-assessment of SMKPAU or independent assessment to assess the suitability and completeness of the documents that will be the criteria for

evaluating the implementation of SMKPAU in the company. The SMKPAU self-assessment is carried out by knowing the suitability and completeness of the documents in the company where there is value in each element of the SMKPAU. After the SMKPAU self-assessment has been carried out there are final results that are categorized according to the assessment.

The data measured is data on the implementation of the safety management system of public transportation companies (SMKPAU) using a questionnaire filled out by the operational department due to direct contact with transportation. In the questionnaire on the implementation of the safety management system of public transportation companies (SMKPAU) there are 30 questions that represent the 10 elements contained in SMKPAU. The implementation questionnaire questions refer to the SMKPAU self-assessment contained in the Minister of Transportation Regulation No. 85 of 2018. Productivity data collection uses a questionnaire to determine the level of worker productivity in doing their work.

The distribution of the questionnaires was carried out after the design of the safety management system of the public transport company (SMKPAU) at PT. Krakatau Argo Logistics. Respondents in this study are operational departments that have direct contact with transportation such as logistics service, safety, internal transport and stevedoring departments.

IV. RESULTS

4.1 Self-Assessment of SMKPAU

The purpose of the SMKPAU self-assessment is to ensure whether transportation safety management has been carried out in accordance with the provisions of laws and regulations, company policies and applicable standards/codes and to critically and systematically assess all potential hazards in public transport operations and determine corrective steps to prevent and/or or controlling potential hazards before they arise as well as for developing the quality/achievement of public transport safety efforts. The self-assessment is carried out by looking at the suitability of documents and the application of the safety management system in the company, then an assessment is carried out according to the values of each question on each element and the acquisition value cannot be greater than the maximum value. Based on Permenhub no.

Table 1 Final Result of SMKPAU Self Assessment

MANAGEMENT SYSTEM ASPECTS				
	CRITERIA	Max Value	Result Value	%
1	Commitments and Policies	150	150	100%
2	Organizing	275	260	95%
3	Hazard and Risk Management	185	180	97%
4	Facility Maintenance and Repair	190	180	95%
5	Documentation and Data	120	120	100%
6	Training Improvement and Competence	110	105	95%

7	Emergency response	85	85	100%
8	Internal Accident Reporting	150	135	90%
9	Monitoring and Evaluation	140	135	96%
10	Performance Measurement	90	70	78%
<b>Total Management Value Information</b>		<b>1495</b>	<b>1420</b>	<b>95%</b>
		<b>Very good</b>		

Based on the table above, the self-assessment of the 10 elements obtained a total score of a maximum value of 1495 and the total value of the acquisition value of 1420. Which means that the assessment of 10 elements gets 95% or very good because the score is more than 85%. Based on Permenhub no. 85 of 2018 if a score of more than 85% is obtained, it is stated that procedures, manuals, work guidelines are available completely and according to requirements and SMK has been implemented in all functions and all elements. Where for the highest value is element 1, element 5 and element 7 with a value of 100% while for the lowest value is element 10 with a value of 78%.

#### 4.2 The Effect of SMKPAU Implementation on Work Productivity

The t-test aims to see the effect of the independent variable or variable X partially on the dependent variable or variable Y. The t-test is carried out by comparing the t-count value with the t-table. Where if the value of sig < 0.05 or t arithmetic > t table then there is an effect of variable X on variable Y, whereas if the value of sig > 0.05 or t count < t table then there is no effect of variable X on variable Y [1]. Based on the results of the t test obtained The significance value of the SMKPAU implementation variable (X1) is 0.000 < 0.05 and the t-count value is 6.182 > 2.005 t table, so it can be said that the SMKPAU implementation factor has an effect on work productivity.

The results of this study are in line with Wahyuni's research [9] which states that the overall analysis results show that the influence of the independent or independent variables, namely the occupational safety and health variables, has a significant effect on the dependent variable, namely the work productivity of PT. Kutai Timber Indonesia. This means that management's policy is to run an occupational safety and health program based on applicable regulations. Based on the results of research conducted to see the effect of occupational safety and health (K3) variables on employee productivity variables, it is known that the significance value is 0.000 < 0.05.

#### 4.3 Effect of Age on Work Productivity

The t-test aims to see the effect of the independent variable or variable X partially on the dependent variable or variable Y. The t-test is carried out by comparing the t-count value with the t-table. Where if the value of sig < 0.05 or t arithmetic > t table then there is an effect of variable X on variable Y, whereas if the value of sig > 0.05 or t count < t table then there is no effect of variable X on variable Y [1]. Based on the results of the t test obtained the significance value of the age variable (X2) is 0.774 > 0.05 and the t count

value is 0.288 < 2.005 t table, so it can be said that the age factor has no effect on work productivity.

The results of this study are in line with Aprilyanti's research [1] which states that the value obtained is the sig. for the effect of age (X) on work productivity (Y) is 0.231 > 0.05 and the t value is 1.228 < t table 2.064, so it can be said that age has no effect on work productivity because the average age of employees is included in the work productive standard. . The age that is still entering the productive period between 20 to 40 years in this study does not have a significant effect on the work productivity obtained. The overall ability of employees at productive age is almost the same. In addition, it is also influenced by the type of work that is not too complicated so it does not require special skills.

#### 4.4 The Effect of Education Level on Work Productivity

The t-test aims to see the effect of the independent variable or variable X partially on the dependent variable or variable Y. The t-test is carried out by comparing the t-count value with the t-table. Where if the value of sig < 0.05 or t arithmetic > t table then there is an effect of variable X on variable Y, whereas if the value of sig > 0.05 or t count < t table then there is no effect of variable X on variable Y [1]. Based on the results of the t test obtained the significance value of the education level variable (X3) is 0.024 < 0.05 and the t-count value is -2.320 < 2.005 t table, so it can be said that the level of education has no effect on work productivity.

This is in line with the results of research conducted by Subarjo in Rismayadi [6] that based on the results of the study it can be seen that the t-test value, for the education level variable is 0.985, while the t-table value is 1.750 (df = 50-4-1 = 45). In addition, the significance value was obtained 0.375. So it can be concluded that partially the level of education has no effect on employee productivity. The level of education has no effect, presumably because the company's employees consider that the level of education is considered not to guarantee an increase in employee productivity.

#### 4.5 The Effect of Working Period on Work Productivity

The t-test aims to see the effect of the independent variable or variable X partially on the dependent variable or variable Y. The t-test is carried out by comparing the t-count value with the t-table. Where if the value of sig < 0.05 or t arithmetic > t table then there is an effect of variable X on variable Y, whereas if the value of sig > 0.05 or t count < t table then there is no effect of variable X on variable Y [1]. Based on the results of the t test obtained the significance value of the variable length of service (X4) is 0.598 > 0.05 and the t value is -0.531 < 2.005 t table, so it can be said that the tenure factor has no effect on work productivity.

This is in line with the results of research conducted by Aprilyanti [1] which states that the value of sig. for the effect of X2 on Y is 0.845 > 0.05 and the t value is -0.198 < t table 2.064, so it can be said that the tenure also has no effect on employee productivity. Because the average employee has a working period that is not much difference.

Work experience in this study did not have a significant effect due to the difference in the working period of a year so that the skills obtained were almost the same. This is different from what Amron in Aprilyanti [1], where an experience span of 5 months to 5 years has an influence on employee work productivity.

#### 4.6 Simultaneous Influence between Variable X and Variable Y

The f test was conducted to see the effect of variable X simultaneously or jointly on variable Y. While the coefficient of determination ( $R^2$ ) was used to determine the percentage of variable X simultaneously or together to explain variable Y. Based on the f test, it was found that f count  $14,998 > 2.54$  f table and a significance value of  $0.000 < 0.05$ , so it can be said that work productivity can be significantly affected by the independent variables of SMKPAU implementation, age, education level and years of service. While the value of R Square is 0.531, it can be interpreted that the effect of variable X simultaneously on variable Y is 53.1%.

The results of this study are in line with the results of Aprilyanti's research [1] which states that the R square value is 0.083, this value states that the effect of the variables X1 (Age) and X2 (service period) simultaneously on the Y variable (work productivity) is 8.3%. and the remaining 91.7% is influenced by other factors outside the research variables. The age of employees who are still in their productive period and the range of work experience that is not far away causes the age factor and years of service to have little influence on work productivity. The cause of the difficulty of employees in achieving the expected work productivity is due to factors outside of this research.

## V. CONCLUSION

In this study, conclusions were obtained after data processing and discussion were carried out, as follows:

1. The overall value of the elements in SMKPAU is 95%. Based on Permenhub no. 85 of 2018 if a score of more than 85% is obtained, it is stated that procedures, manuals, work guidelines are available completely and according to requirements and SMK has been implemented in all functions and all elements and is in the very good category.
2. Obtained a significance value of  $0.000 < 0.05$  and a t-count value of  $6.182 > 2.005$  t-table, so it can be said that SMKPAU implementation factors affect work productivity.
3. The significance value is  $0.774 > 0.05$  and the t count value is  $0.288 < 2.005$  t table, so it can be said that the age factor has no effect on work productivity.
4. Obtained a significance value of  $0.024 < 0.05$  and a t-count value of  $-2.320 < 2.005$  t table, so it can be said that the level of education has no effect on work productivity.
5. The significance value is  $0.598 > 0.05$  and the t value is  $-0.531 < 2.005$  t table, so it can be said that the working period factor has no effect on work productivity.
6. Obtained f count  $14,998 > 2.54$  f table and a significance value of  $0.000 < 0.05$ , so it can be said that work productivity can be significantly affected by the independent variables of SMKPAU implementation, age, education level and years of service. And the value of R Square obtained

is 0.531, this can be interpreted that the effect of variable X simultaneously on variable Y is 53.1%.

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