

ANALYSIS OF THE APPLICATION OF THE CONSTRUCTION SAFETY MANAGEMENT SYSTEM (CSMS) TO THE COST BUDGET PLAN (CBP) IN THE SYAMSUDIN NOOR INTERNATIONAL AIRPORT ACCESS ROAD CONSTRUCTION PROJECT

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ABSTRACT

Syamsudin Noor International Airport Access Road Construction Project is a road infrastructure development with a 2.78 Km long work route that has the possibility of work accidents. This is due to the relatively long work location and direct contact with the community. Therefore, to reduce the number of work accidents, it is necessary to pay special attention to the field of Construction Safety Management System (CSMS) in the work environment. Data were collected through observation and distribution of questionnaires to ten respondents, then the data were processed using the SPSS 26 program. The results of the analysis of the implementation of the construction safety management system in the Syamsudin Noor International Airport Access Road Construction Project have been running well. However, in its application there are still obstacles caused by the factor of lack of safety awareness, the factor of the absence of strict sanctions for violators of Occupational Health and Safety (OHS), and the factor of workers feeling uncomfortable when using personal protective equipment. Also, it is known that the influence of variable X (CSMS) and variable Y (CBP) is 89.5% based on the coefficient of determination (*Adjusted R Square*).

Keywords: Construction Safety Management System, Cost Budget Plan.

1. INTRODUCTION

In realizing a safe and healthy work zone for businesses, workers and communities, the Construction Safety Management System (CSMS) must be implemented into the construction project management system. The implementation of this system plays an important role in the mitigation of work-related hazards in various construction job roles. Its impact on the construction process is profound, thereby increasing worker protection, lowering fatalities, reducing costs, and minimizing lost man-hours.

This research focuses on the Syamsudin Noor International Airport Access

Road Construction Project located along Jalan Ahmad Yani KM.29, East Landasan Ulin District, Banjarbaru, South Kalimantan with a construction line of 2.78 km and directly related to people's lives. This certainly increases the risk of accidents and threatens the safety of the community and environmental workers. Thus, special attention needs to be paid to the implementation of the construction safety management system and the allocation of funds for purchasing goods and Occupational Health and Safety (OHS) training.

The purpose of this analysis is to show how the construction safety management system is implemented in the field, find factors that hinder the implementation of the system, and find out the relationship between the implementation of the system and the project cost budget plan.

2. THEORETICAL FOUNDATION

Construction Safety Management System

In accordance with the Regulation of the Minister of PUPR Number 10 of 2021, the construction management system is included in the construction project management system to ensure construction safety. Its implementation is based on the roles, responsibilities and authorities of service providers who provide services such as management consulting construction and construction completion.

Cost Budget Plan

Cost Budget Plan (CBP) is an estimate of the cost to complete a construction project. It includes the amount of materials required, labor costs, total costs, and unit costs (Nugroho, Beeh, & Astuningdyas, 2009).

Simple Linear Regression Analysis

A statistical calculation called simple linear regression analysis is used to identify the relationship between the dependent variable whose value depends on other variables, and the independent variable whose value does not depend on other variables (Wulansari, 2016).

3. METHODS

This research focuses on the Syamsudin Noor International Airport Access Road Construction Project by using primary data obtained from field observations

and distributing questionnaires. Also, secondary data was obtained from the service provider in the form of general project data. The distribution of questionnaires consisted of three parts distributed to workers and experts with an assessment score on the questionnaire based on the Likert Scale.

In this study, quantitative methods were used to identify the constraint factors and how the construction safety management system was implemented in the field through descriptive analysis calculations. In addition, the relationship between cost budget planning and the implementation of construction safety management system was found by using simple linear regression analysis. The variables in the questionnaire were obtained from the project's Construction Safety Plan (CSP) as well as related literature studies.

4. RESULTS AND DISCUSSION

The following are the questionnaire indicators used along with the results of the analysis that has been carried out:

Table 1. Questionnaire Statement Regarding the Application of Cost Budget Plan (CBP) on Construction Safety

No.	Questionnaire
1	Do you agree that your company has provided OHS training to workers in accordance with the cost budget plan?
2	Do you agree that your company has provided first aid treatment for employees in accordance with the cost budget plan?
3	Do you agree that your company has provided personal protective equipment (PPE) for safe work protection in accordance with the cost budget plan?
4	Do you agree that your company requires every employee to attend OHS training as stated in the cost budget plan?
5	Do you agree if your company provides health insurance for each worker as stated in the cost budget plan?

Table 2. Questionnaire Statement Regarding the Implementation of the Construction Safety Management System (CSMS)

No.	Questionnaire
1	Every worker always uses safety equipment

No.	Questionnaire
2	Every worker is in a safe working environment
3	In the work environment, safety markings and warnings are available. Work.
4	All work tools are functioning properly and can be used according to their function
5	The equipment and machinery used in the project are operated by experienced and licensed workers.
6	OHS experts always supervise the implementation of work regularly regarding work safety procedures.
7	During certain conditions the project site has lighting and illumination which is good enough
8	The company has provided a first aid kit for workers' first aid.
9	The company has provided safety insurance coverage to every employee Work.
10	Insurance that has been facilitated by the company can be used properly and easy.

Table 3. Obstacle Factors in Practicing Construction Safety Management System (CSMS)

No	Questionnaire
1	The company does not carry out regular inspections of hazardous working conditions and methods in the work environment.
2	The company does not provide complete PPE to workers
3	The company does not conduct OHS training & socialization to workers
4	Workers feel uncomfortable when using PPE
5	Workers are used to working without PPE
6	Lack of awareness of the importance of work safety in the field by workers
7	Lack of supervision in the application of OHS in the work environment
8	No strict sanctions for K3 violations

Research Instrument Test

With the help of the SPSS 26 program, the validity test was carried out using the Pearson Product Moment Correlation model on the Construction Safety Management System Implementation variable (X) and the Cost Budget Plan variable (Y). If a variable provides a significant value $< 5\%$ or 0.05 then the variable is considered valid. However, the index is considered invalid if the

value obtained is greater than 5% or 0.05. It can be concluded that the questionnaire indicators used are valid for both variables. In addition, when conducting a reliability test with Cronbach's Alpha internal consistency, a value of 0.890 and 0.962 is obtained which exceeds 0.70. It can be concluded that these variable parameters are reliable.

Table 4. Recapitulation of Validity Test

VALIDITY TEST			
CSMS (X)	Significant Value Output	Significant Value	Description
X1	0,007	< 0,05	VALID
X2	0,011		
X3	0,011		
X4	0,035		
X5	0,026		
X6	0,040		
X7	0,019		
X8	0,035		
X9	0,040		
X10	0,011		
CBP (Y)	Significant Value Output	Significant Value	Description
Y1	0,013	< 0,05	VALID
Y2	0,002		
Y3	0,002		
Y4	0,014		
Y5	0,002		

Table 5. Recapitulation of Reliability Test

RELIABILITY TEST			
Variables	Significant Value Output	Significant Value	Description
CSMS (X)	0,890	< 0,70	RELIABLE
Variables	Significant Value Output	Significant Value	Description
CBP (Y)	0,962	< 0,70	RELIABLE

Analysis of the Relationship between the Implementation of the Construction Safety Management System (CSMS) and the Cost Budget Plan (CBP) in the CSMS Field

In this analysis, the construction safety management system variable is used as the independent variable (X) and the cost budget plan as the dependent variable (Y). To determine the relationship between the application of the

Construction Safety Management System to the Cost Budget Plan, a simple linear regression analysis was performed using the questionnaire results in Table 1 and Table 2.

Table 6. Simple Linear Regression Test

Model	Unstandardized Coefficients	t	sig.	R	R Square	Adjusted R Square
	B					
(Constant)	24,764	82,957	0,000	0,96	0,921	0,895
CSMS	-0,039	-5,923	0,010			

The general regression equation is as follows:

$$Y = 24,764 - 0,039X$$

Where if there is no change in the construction safety management system variable (value $X = 0$), the cost budget plan variable is 24.764. If the application of the construction safety management system decreases by one (1) unit, the cost in the cost budget plan will decrease by 0.039 or equivalent to 3.9%. Based on Table 7, the significance value is 0.010 and the value is less than 0.05.

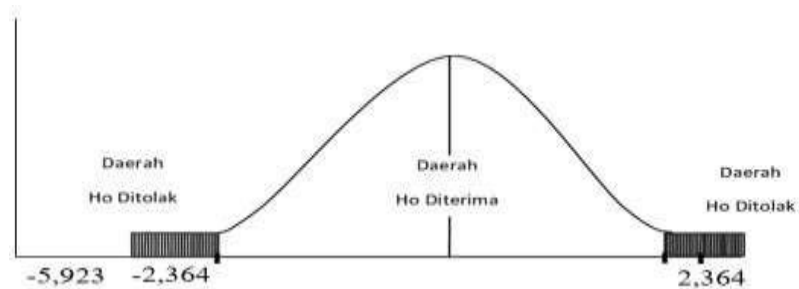


Figure 1. 1 Two-sided Curve

Based on the T value, the calculated T value is -5.293, which when viewed using a two-sided curve (Figure 1.1) shows that this value is in the H_0 rejected area (has an influence). And if viewed further, the Adjusted R Square output result is 0.895. Therefore, it can be concluded that the implementation of the construction safety management system has a high impact of 89.5% on the cost budget plan.

Then, based on the analysis of the questionnaires in Table 2 and Table 3, it is known that the implementation of the construction safety management system in

the field and the constraining factors in its implementation. So, it is concluded that if the implementation has been well realized, but there are still obstacles caused by several main factors, namely: lack of awareness of the importance of work safety in the field by workers, the absence of strict sanctions given by the company for K3 violators, and workers feel uncomfortable when using Personal Protective Equipment (PPE).

5. CONCLUSIONS

The conclusion based on data analysis of the Syamsudin Noor International Airport Access Road Construction Project is as follows:

1. From the results of the analysis, it was found that the implementation of the construction safety management system in the Siamsudin Noor Airport Access Road Construction Project obtained that all work safety procedures have been implemented properly.
2. The main obstacles to the implementation of the construction safety management system on this project are known to be three things, namely the lack of awareness of the importance of work safety, the absence of sanctions for violators, and workers not using personal protective equipment.
3. The relationship between the implementation of the construction safety management system and the cost budget plan based on the Adjusted R Square value is 89.5%.

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