Analysis the Cost Components of the Implementation SMK3 in Building Projects in the City of Makassar

Rosmariani Arifuddin, Rusdi Usman Latif, Muhammad Harly Kalma

Abstract: ***Implementation SMK3 of a project greatly affect against the performance of a construction company, then budgeting for the SMK3 implementation very important to notice. This study aims to identify the cost components of K3 and analysing the costs allocated by construction companies in the city of Makassar. This research was conducted in the city of Makassar by taking several building construction projects in Makassar as observation sample. The method used is the questionnaire analysis and archives analysis, which consists of 30 people who work in the safety department. The data analysis of the questionnaire was executed using SPSS. The archives analysis has done by comparing multiple archives of RAB K3 from several building projects in the city of Makassar. This study had identified 14 dominant cost components of K3 that significantly influence the performance improvement of Occupational Health and Safety (K3) in high rise building construction projects in the city of Makassar.***

Keywords: ***Construction project, Construction, Cost components, SMK3.***

I. INTRODUCTION

The construction worker is highly exposed to high risk of accidents as they work in a hazardous place and many sophisticated and manual equipment involved [1-3]. The lack of workers' knowledge regarding the Occupational Safety and Health (K3) is also one of the causes of accidents [4, 5]. Work safety is the main means for the prevention of accidents, disability, and death as a result of work accidents [6]. Thus, K3 supervision is vital to minimize the number of accidents in the workplace. The implementation of occupational safety and health (K3) is to create a workplace that is safe, healthy, and free from environmental pollution in order to reduce workplace accidents and occupational diseases [7]. Besides that, this directly improves the work efficiency and productivity as well as the employee loyalty to the company.

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Rosmariani Arifuddin, Civil Engineering Department, Faculty of Engineering, University of Hasanuddin, Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan, 90245, Indonesia.

Rusdi Usman Latif, Civil Engineering Department, Faculty of Engineering, University of Hasanuddin, Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan, 90245, Indonesia,

Muhammad Harly Kalma, Civil Engineering Department, Faculty of Engineering, University of Hasanuddin, Jl. Perintis Kemerdekaan Km. 10, Tamalanrea Indah, Tamalanrea, Kota Makassar, Sulawesi Selatan, 90245, Indonesia.

The existing accident data show that construction work is an activity that is always exposed to high risk of accidents [1]. The workplace accidents eventually reduce the progress of the project [8]. The main cause of workplace accidents is the lack of optimal K3 implementation. The company's management should put in efforts to prepare for work accident prevention [9]. Besides that, the training and implementation of the Occupational Health and Safety Management System (SMK3) is a great approach to control the numbers of a workplace accident. Work accidents due to human error can be prevented. The K3 training can effectively create awareness on work accident among the construction worker by supervision and SMK3 qualifications [9]. Moreover, the implementation of the Occupational Health and Safety Management System (SMK3) in a project can improve the performance of a construction company by reducing the number of work accident.

According to Asiyanto (1998) construction costs is prone to work accidents so that the cost of accidents becomes so influential in the budget and project implementation [10]. The implementation of a good work safety and health program can reduce the cost of accidents due to work because these costs are one of the elements associated with the K3 program [8]. Implementation of the SMK3 required certain budget for worker safety equipment, management fee and procedure fee [11]. The budget for implementation of SMK3 plays an important role. Therefore, this study analysis the cost components of construction project SMK3 implementation in the city of Makassar, Indonesia.

II. RESEARCH METHODOLOGY

Research variable

The components of K3 cost that affect the construction project is independent variable and defined as (X). While, the improvement of the performance of the implementation of occupational safety and health in construction a project is dependent variable and defined as (Y).

Questionnaire

A set of questionnaire is prepared and the alternative answer is provided based on the literature study and archive analysis of previous research conducted by the author. About 30 respondents from several construction projects in the city of Makassar participate in this study.

Data Archive

Data archives in the form of safety cost data obtained from multi-storey building projects which provide information of K3 cost components applied by the contractor to a multi-storey building construction project. There are 4 high-rise building projects in Makassar that are used as research samples, but only obtained 3 safety budget data from the data collection in the field.

Measurement Scale

The measurement scale used in this study is a Likert scale, which is a psychometric scale commonly used in questionnaires. Likert scale is used to measure the attitudes, opinions, and perceptions of a person or group of people about a phenomenon or phenomenon of education.

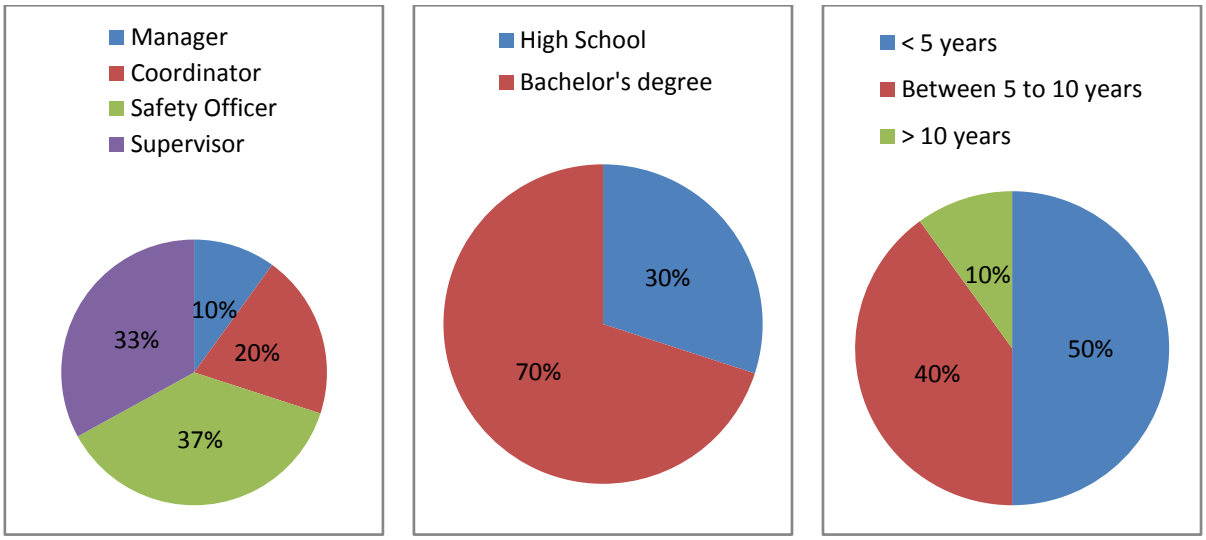
Analysis Method

Microsoft Excel and SPSS programs (Statistical Product for service solution) are used to facilitate the data analysis. The types of statistical tests used in this study include normality, homogeneity, validity, reliability and Spearman rank tests. The Spearman rank test is used to determine the significant relationship between variable X and variable Y so that the cost component can be produced that has the most influence on the application of K3 in multi-story building construction projects.

III. RESULT AND DISCUSSION

Normality test

The result from normality test indicated the data in this study were distributed abnormally, thus non-parametric homogeneity test was conducted to determine whether there is a different level of understanding between respondents to the assessment of existing variables. In this case the respondent's backgrounds were identified in categories of job position level, education level, and working experience.



(a) Job position level (b) Education level (c) Working experience

Fig. 1 Charts of respondent data based on (a) Job position level, (b) Education level and (c) Working experience

Test Validity and Reliability

The validity and reliability is used to assess the validity of the data collected from the questionnaire. Table 1.0 tabulates the results from the validity test of 39 research variables using SPSS v.16.

Table 2.0 shows the reliability testing result of the questionnaire data by using the alpha conbrach method. Practically the Cronbach's Alpha value less than 0.6 indicated that the research questionnaire is not reliable. While, the Cronbach's Alpha value more than 0.6 indicated that the research questionnaire is reliable.

Table. 2.0The Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.898	0.903	30

Correlation Test (Spearman Rank)

Correlation test is used to determine the relationship between the independent variables and the dependent variable. The 2-tailed Sig. value will indicates the status of correlation between the variables. There is a significant correlation between the variables when the Sig. value is less than 0.05. While, the Sig. value more than 0.05 reflects that there is no significant correlation between the variables. Table 1.0 illustrates the output results of the correlation test between variables X (cost components that affect the implementation of K3) with variable Y (performance improvement of K3 implementation).

Based on Table 1.0, there are 14 variables have a significant correlation to the variable Y, namely X5, X12, X13, X24, X29, X31, X32, X33, X34, X35, X36, X37, X38, X39.

The 14 variables marked the Sig. (2-tailed) value less than or equal to 0.05. In other words, the 14 variables have a correlation (+) to the Y variable which shows the relationship between variables X and Y which are in the same direction. The 14 variables that included in the questionnaire are under four different categories. The first category is K3 Management Fee (Cost for K3 Supervisor), second is K3 Procedure cost (Worker Compensation and Health Check), third is Field safety costs (Safety net) and last is Worker Safety Costs (Safety Helmet, Safety Shoes, Eye Protection Equipment, Gloves, Safety Belt, Safety Harness, First Aid, Mask, Ear Protectors and Workmanship / Vest). In addition, it was found that the amount of K3 costs for high-rise building projects in the city of Makassar is around 0.4 - 0.5% of the value of the project contract and the average cost is about 0.44%.

Table 1.0: The Item-Total Statistics table and the results of the correlation test

Variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Correlation Coefficient	Sig. (2-tailed)	N
X1	156.67	221.678	0.281	0.897	-0.105	0.582	30
X2	156.83	215.316	0.612	0.893	0.127	0.503	30
X3	156.97	220.033	0.29	0.897	0.089	0.641	30
X4	157.03	219.895	0.348	0.896	0.091	0.631	30
X5	157.23	220.806	0.254	0.898	***0.374***	***0.042***	***30***
X6	157.27	217.168	0.449	0.895	0.336	0.07	30
X7	157.23	219.702	0.23	0.899	0.053	0.78	30
X8	157.57	220.53	0.326	0.897	0.359	0.051	30
X9	156.83	218.213	0.369	0.896	0.24	0.201	30
X10	157.1	218.576	0.329	0.897	0.149	0.433	30
X11	156.3	225.114	0.209	0.898	0.21	0.266	30
X12	156.83	221.385	0.318	0.897	***0.427***	***0.019***	***30***
X13	156.87	219.844	0.373	0.896	***0.441***	***0.015***	***30***
X14	157.4	217.007	0.377	0.896	0.261	0.164	30
X15	157.33	211.609	0.501	0.894	0.257	0.17	30
X16	157.27	215.306	0.476	0.894	0.111	0.56	30
X17	157.8	218.303	0.328	0.897	0.102	0.591	30
X18	157.57	213.082	0.46	0.895	0.144	0.449	30
X19	156.87	210.947	0.636	0.892	0.341	0.065	30
X20	156.4	217.352	0.602	0.894	0.252	0.179	30
X21	157.3	218.079	0.306	0.897	0.074	0.697	30
X22	156.93	225.995	0.071	0.9	-0.12	0.527	30
X23	156.63	216.516	0.509	0.894	0.357	0.053	30
X24	156.57	220.875	0.361	0.896	***0.514***	***0.004***	***30***
X25	156.83	221.454	0.257	0.898	0.19	0.315	30
X26	156.9	217.059	0.453	0.895	0.223	0.235	30
X27	156.9	220.921	0.235	0.898	0.27	0.15	30
X28	156.7	222.217	0.227	0.898	0.257	0.17	30
X29	156.27	220.409	0.534	0.895	***0.501***	***0.005***	***30***
X30	156.47	212.671	0.643	0.892	0.347	0.06	30
X31	156.47	214.051	0.618	0.893	***0.427***	***0.019***	***30***
X32	156.77	210.047	0.709	0.891	***0.552***	***0.002***	***30***
X33	156.67	213.195	0.712	0.892	***0.386***	***0.035***	***30***
X34	156.7	209.459	0.658	0.891	***0.519***	***0.003***	***30***
X35	156.77	210.944	0.613	0.892	***0.578***	***0.001***	***30***
X36	156.43	218.944	0.507	0.895	***0.433***	***0.017***	***30***
X37	156.73	220.754	0.308	0.897	***0.372***	***0.043***	***30***
X38	156.93	220.064	0.314	0.897	***0.452***	***0.012***	***30***
X39	156.93	213.306	0.458	0.895	***0.58***	***0.001***	***30***

IV. CONCLUSION

The correlation result has highlighted 14 cost component variables that significantly influence the performance improvement of Occupational Health and Safety (K3) in high rise building construction projects in the city of Makassar.

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