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Risk Analysis of Upgrading Project of Small Clinic to Hospital in Masbagik, East Lombok Regency, Indonesia

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ABSTRACT: *During the building construction procedure, there are a variety of high-risk factors. So as to have a negative impact on the project's productivity, performance, quality, and cost constraints. This study seeks to determine the project implementation risk factors, identify the most significant risks, and conduct risk assessments to anticipate all types of risk. This qualitative study employs a questionnaire, and the analysis is conducted by ranking the risk factors from most significant to least significant. SPSS was utilized to conduct a validity and reliability test on the questionnaire. From the results of the data analysis, it was determined that there were nine risk factor variables; the most influential risk was the quality of concrete that did not meet the specifications, with an average value of 3.87, and the risk with the highest risk category was erratic weather.*
Keywords: *risk analysis, project, validity and reliability test, SPSS.*

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I. INTRODUCTION

The population of East Lombok Regency is 1,343,905 individuals. In terms of population, Pringgabaya ranks first with a total of 112,373 people, followed by Masbagik with a total of 109,412 people [1]. The East Lombok Regency Government has a vision for the welfare of this population, where a prosperous community can appreciate access to health facilities. Consequently, the East Lombok Regency Government intends to convert the new Masbagik Small Clinic into a hospital of type D. The facility is intended to serve the Masbagik District and surrounding communities.

Various high-risk factors are unavoidable in the construction of high-rise buildings. These risk factors can have an adverse effect on the construction work process and the productivity, performance, quality, and cost limitations of the project. Risk can be defined as an outcome that may occur unexpectedly. Even though an activity has been meticulously planned, it remains uncertain whether everything will go according to schedule. Risks in construction initiatives cannot be eliminated, but they can be mitigated or transferred to another party [2].

On the basis of this information, it is necessary to conduct identification with the title "Risk Analysis in the New Masbagik Small Clinic Improvement Project to Become a Type D Hospital in Masbagik District, East Lombok Regency," which will be used by construction service business owners, particularly those engaged in building construction, to identify risks and take appropriate steps to manage those risks.

Risk, as defined by the Oxford Dictionary in Norken [3], is the possibility of experiencing or sustaining damage. Moreover, according to Lavanya and Malarvizhi [4], risk management is an essential project management practice for mitigating distress during the project's execution. The objective of project risk management is to maximize positive opportunities and minimize negative or detrimental opportunities that could truly occur during the project's duration.

According to Godfrey [5] of the Construction Research Industry and Information Association (CIRIA), the risk value is determined by multiplying the risk's frequency or occurrence with its consequences. The likelihood of a loss occurring is expressed as the number of occurrences per year. In the meantime, the consequence is the monetary value of the loss induced by the occurrence of an adverse event.

In general, hazards can be categorized as follows, based on the tendency of the probability of their occurrence and the resulting consequences: a) Unacceptable is an intolerable risk must be eliminated; b) Undesirable is a risk that is not expected and must be avoided; c) Acceptable is a risk that is acceptable; d) Negligible risk is completely acceptable. According to ISO 31000 [6], risk assessment involves identifying risks that may affect the achievement of organizational goals, conducting a risk analysis to analyze the likelihood and impact of identified risks, and conducting a risk evaluation to compare the results of the risk analysis with risk criteria to determine how to handle identified risks.

This study's objectives were as follows: a) to identify the risk factors in the implementation of the Masbagik Small Clinic project to become a Type D hospital; b) to identify the most influential or dominant risk factor (major risk) on the implementation of the Masbagik Small Clinic improvement project to become a Type D hospital; and c) to conduct a risk assessment to anticipate all forms of risk so that negative impacts can be mitigated.

II. RESEARCH PROGRAM

This study was conducted at the Masbagik Small Clinic in South Masbagik village, Masbagik District, East Lombok Regency. Due to its location in a new area, the physical development process will be straightforward and will not disturb the existing structure, which is still located in the same area as the Masbagik Small Clinic area.

The research approach determines how a study is conducted, from data collection to information analysis. Sorting the used variables facilitates the analysis. To calculate the average value (mean) of the questionnaire list in order to determine the risk factor's dominant influence. In the meantime, the index technique is used to determine the relative importance of the influencing and determining factors by calculating the Relative Importance Index value.

The index values are then ordered in descending order in a table of factors with the lowest average value. The factor with the highest average value is identified as the factor that influences risk the most. The smaller the average value, the fewer the variables that influence the implementation risk of a construction project. After conducting a risk analysis, validity and reliability testing were conducted using SPSS to ascertain the validity of the questionnaire's question items [7], [8]. Then, analyze the risk acceptability level based on the product of the possibility scale and the risk consequences. Based on the results of this risk acceptance, an evaluation is conducted to determine which risks are untenable and undesirable, as well as the mitigation measures to be taken. In order to generate results from which conclusions can be derived.

III. RESULTS AND DISCUSSION

SPSS was used to conduct validity and reliability tests on questionnaires. All valid questionnaires were obtained with a r count value of 0.406> r-table 0.361 and all reliable questionnaires with a Cronbach's alpha value of 0.945> 0.60. The data collection method used in this study was interviews, where the respondents who filled out the questionnaire were experts working on the project, experts working in construction management consultancy firms, and experts related to the project to be studied. The risk factor variable was obtained from observations based on project implementation activities, where there were nine risk factors identified. The results of the ranking order analysis based on the risk factor indicators can be seen in Table 1.

Table 1. Order of Rank based on Risk Factor Indicators (RFI).

No	Code	Risk Factor Indicators	X	Relative Importance Index	Ranking	Explanation
1	f.5	The quality of the concrete does not match the specifications	3.87	0.97	1	Very influential
2	e.2	The difference in specification interception between the owner and executor	3.50	0.88	8	Influential
3	d.1	Lack of discipline of workers using Personal Protective Equipment	2.47	0.62	34	Less Influential

According to the findings of the analysis of risk factor indicators, there were 26 indicators of risk factors that were influential, 5 indicators were less influential, and 7 indicators of risk factors were highly influential.

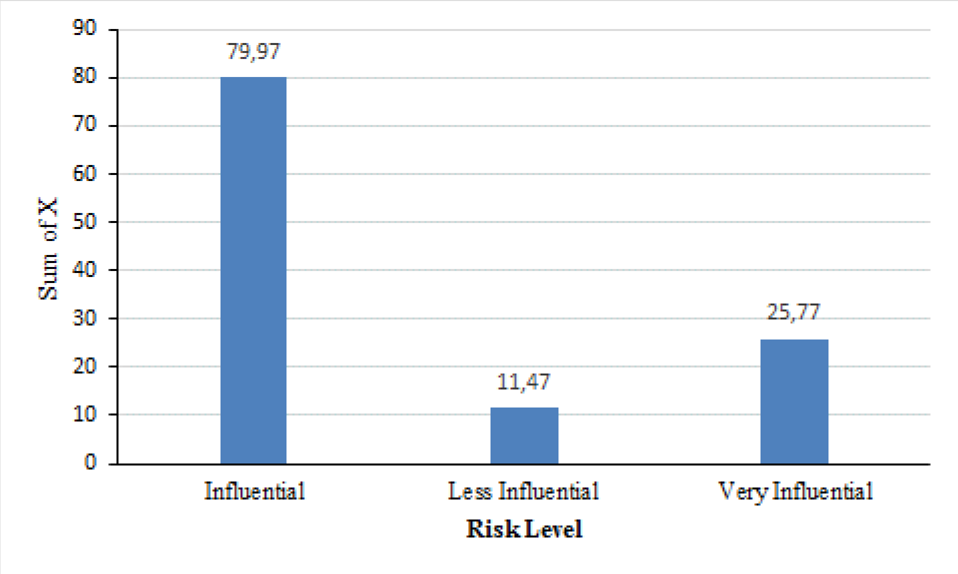

Fig. 1 Risk Factor Indicators

The most significant Risk Factor Indicator, according to Fig. 1, has an X value of 79.97. The final Highly Influential Indicator's X value is 25.77, whereas the Less Influential Risk Factor Indicator's value is 11.47.

Table 1. Risk Assessment.

No	Code	Risk Factor Indicators	Probability (P)	Impact (I)	P x I	Risk Category
1	a.3	Erratic Weather	3	4	12	High
2	b.2	Material damage or loss (theft).	3	4	12	High
3	g.3	Coordination with the owner to simplify the approval process for design changes to shorten the time.	3	4	12	High
4	h.1	Analyze the obstacles that occur in the field and then catch up on delays in progress that occur quickly and precisely.	3	4	12	High

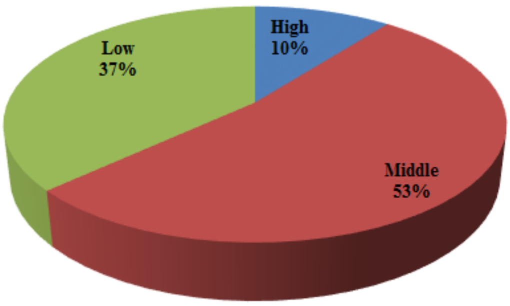

Fig. 2 Risk Assesment Category

After carrying out a risk analysis by multiplying the probability by the Impact, a risk assessment is then carried out, and it is found that there are 4 High Risk categories; for the Medium Risk category, there are 20 categories and the last is the Low Risk category, there are 14 categories. Four variables are declared to be at a high level with a percentage of 10%, 20 variables are declared to be at a moderate level with a percentage of 53%, and 14 variables are declared to be at a low level with a percentage of 37%, according to the findings of multiplying probability and impact.

IV. CONCLUSION

Based on the results of research and analysis, it can be concluded:

1. Identified nine risk factor variables, namely Force Majeure factors, Material Factors, Equipment Factors, Labor Factors, Contractual Factors, Construction Factors, Design and Technology Factors, Management Factors, Environmental Impact Factors.
2. The risk factors that have the most influence on the implementation of the development project for the Improvement of the New Masbagik small clinic to a Type D hospital in the Masbagik District are as follows:
    a. The quality of the concrete does not match the specifications.
    b. Reinforcement errors (dimensions, spacing, and quality of reinforcement).
    c. Suitability of the dimensions worked (length, width, height).
    d. The initial design is not in accordance with the reality in the field.
    e. Design Error.
    f. There is a design change.
    g. Cost estimation error.
3. The highest risk assessment is obtained from the results of the calculations carried out as follows:
    a. Erratic weather.
    b. Material damage or loss (theft).
    c. There is a design change.
    d. Cost estimation error

REFERENCES

[1] BPS, *Kabupaten Lombok Timur Dalam Angka 2023*. Lombok Timur: Badan Pusat Statistik.

[2] I. B. N. PURBAWIJAYA, *Analisis Risiko Pada Proyek Pembangunan Sentral Parkir Di Pasar Badung*. Denpasar: Universitas Udayana, 2017.

[3] I. G. N. O. S. I Nyoman Norken, Ida Bagus Ngurah Purbawijaya, *Pengantar Analisis Dan Manajemen Risiko Pada Proyek Konstruksi*. Denpasar: Udayana University Press.

[4] T. Lavanya, N. & Malarvizhi, "Risk analysis and management: a vital key to effective project management," in *PMI® Global Congress 2008—Asia Pacific*, Sydney: Project Management Institute, 2008.

[5] P. S. Godfrey, "Control of Risk: A Guide to the Systematic Management of Risk from Construction," *Ciria*, no. 978-0-86017-441–7. pp. 1–72, 1996.

[6] ISO/TC 262 Risk management, *ISO 31000:2018 Risk management — Guidelines*, 2nd ed. 2018.

[7] I. Ghozali, *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 21 Update PLS Regresi*, 7th ed. Semarang: Badan Penerbit Universitas Diponegoro, 2013.

[8] D. D. S Zein, L Yasyifa, R Ghozi, E Harahap, FH Badruzzaman, "Pengolahan Dan Analisis Data Kuantitatif Menggunakan Aplikasi SPSS," *JTEP-Jurnal Teknol. Pendidik. dan Pembelajaran*, vol. 4, no. 1, pp. 1–7, 2019.