RISK MANAGEMENT ON ACCESS NETWORK DEPLOYMENT "STTF PROJECT" (CASESTUDY: PT TELKOM INDONESIA TBK)

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ABSTRACT:*PT Telkom Indonesia Tbk, as one of the leading firms operating in the telecommunications sector in Indonesia, has the largest access network, extending from Sabang to Merauke. Users of the IndiHome service are growing annually. Therefore, PT Telkom Indonesia Tbk keeps deploying access networks to increase service coverage and offer the community and its users the best possible service. This access network deployment activity directly affects company's revenue. There is a risk of not generating revenue if there are obstacles in the project. As a result, risk management is essential for this project. This research was written using the ISO 31000 framework, which includes a stage for risk assessment in the form of risk identification, risk analysis, and risk treatment. 19 risk events have been identified in the risk identification process, and they are divided into four categories: financial, legal, environmental, and operational risk. Once the risk events have been identified, risk analysis is conducted using the Analytical Hierarchy Process (AHP) method to determine the priorities of the risk events. In the risk treatment, 13 risks proposed to be reduced, 3 risks proposed to be avoided, 1 risk proposed to be transferred, and 2 risks proposed to be accepted.*

KEYWORDS -*Risk Management, Analytical Hierarchy Process, Access Network Deployment*

I. INTRODUCTION

The advancement of communication technology is accelerating at an incredible rate in the contemporary era of globalization. It directly or indirectly has a significant impact on daily activities. Currently, almost all of Indonesia's regions have internet access provided by various internet service providers. As one of the leading firms operating in the telecommunications sector, PT Telkom Indonesia Tbk has launched a broadband service named IndiHome. IndiHome service users are increasing in every year, especially during the pandemic, where almost all activities are done online. This affected the demand for IndiHome services for getting higher. Therefore, PT Telkom Indonesia Tbk continues to develop its network in order to expand service coverage to provide the best service to the community and its users. As one of the telecommunications areas (Witel) in Indonesia, PT. Telkom Indonesia Witel Singaraja routinely carries out this network deployment project every year. The access network deployment named STTF project itself consists of several phases in a year. In 2022, some phases are already running, some are in progress, and some are not yet running. The access network deployment STTF project is a crucial activity for the company because it directly impacts the revenue of PT Telkom Indonesia Tbk. After all, the access network is a production tool to deliver internet services to customers. If there are obstacles in the process of implementing the access network deployment, of course there will be a risk of not achieving revenue. In addition, some risks can occur, resulting in project time delays that are not in accordance with estimates, leading to reduced incremental revenue. Therefore, for this project's success and smooth running, it is essential for PT Telkom Indonesia Witel Singaraja to immediately anticipate the occurrence of risks by carrying out risk management and risk response on this project, especially for ongoing and future projects. The company can manage risk by identifying and analyzing possible impacts, evaluating the effects on all project activities, and providing risk treatment to be implemented to minimize risks.

The purpose of this research is to identify and analyze the risk that can occur in the access network deployment STTF Project activities at PT Telkom Indonesia Tbk Witel Singaraja. Thus, the writer will provide the authorities with recommendations on the risk project response plan. This research can provide benefits for network deployment activities in the company to manage, eliminate, and improve risk management. With detailed risk management, the chances of project success will be greater, which will lead to the achievement of revenue targets.

II.   BUSINESS ISSUE EXPLORATION

2.1   Literature Study

Project risk is an uncertain phenomenon that can influence the outcome of a project. Therefore project risk management is very important to ensure that project risks provide minimal negative outcomes, especially for large-scale projects.Risk management is often related to uncertainty management, because it deals with uncertain things that may occur in the surrounding environment. [1]Based on SBC Warburg (1998), risk management is a comprehensive set of policies, procedures, owned by the organization, to manage, monitor and control the organization's exposure to risk.The main goal of project risk management is to identify any associated risks and take preventive and corrective measures in order to prevent or minimize negative impacts.

2.2   Research Methodology

This research is constructed using a quantitative and qualitative method. The quantitative approach uses an appointed weight ratio to calculate risk rating based on importance level utilizing AHP. The qualitative approach involves gathering data and reviewing the literature. There are two ways to collect data: primary and secondary. Primary data will be gathered through interviews and focus groups, while secondary data will come from the company's supporting materials, such as reports, meetings with internal and external parties, and external sources.

2.3   Conceptual Framework

The ISO 31000 framework is used in this study as a reference for addressing issues with risk management. The International Organization for Standardization has released the risk management standard ISO 31000. It includes principles and recommendations that organizations or businesses can use when identifying, evaluating, and reducing risks.By understanding the principles of good risk management, risk can be an opportunity for the organization to perform better and maximize the organization's potential in achieving its goals. This standard on risk management can be applied in various sectors and is one of the requirements for almost all management system standards. [2] Based on the Badan Standarisasi Nasional, in ISO 31000 there are several stages that must be carried out, namelyEstablishing the Management Context, Risk Identification, Risk Analysis, Risk Evaluation, and Risk Treatment.

2.4   Internal Analysis

In conducting internal analysis, the author uses a SWOT analysis framework. In general, a SWOT analysis will assist business owners in gathering organized data about their company's strengths, weaknesses, opportunities, and threats. SWOT analysis is crucial for formulating strategies, so it can be used to identify strategic risks. The company's internal strengths and weaknesses can address risks related to the organizational, financial, operational, and cultural aspects of the strategy. Interviews with the parties involved and secondary data research were done as part of this SWOT analysis.

2.5   External Analysis

In conducting external analysis, the author uses the PESTLE analysis framework. One of the risk management techniques used to assess the external business environment is PESTLE analysis. This analysis's objective is to provide a broad overview of the effects the organization might experience from the external environment. The objective of this analysis can also be taken into consideration when selecting a solution to a problem. PESTLE analysis, or political, economic, social, technological, legal, and environmental factors, is used in the risk management of the access network deployment project. Interviews with the parties involved and secondary data research were done as part of the PESTLE analysis.

III.   BUSINESS SOLUTION

3.1   Establish the Context

Establish the context aims to identify and disclose organizational goals, the environment in which the objectives are to be achieved, stakeholders, and the diversity of risk criteria, which will help reveal and assess the nature and complexity of risks. The context must be established in four contexts: the internal context, the external context, the risk management context, and the risk criteria.

The internal context pays attention to the internal side of the organization. In this case, the internal context related to the process of project deployment, stakeholders, and SWOT analysis at PT Telkom Indonesia Tbk Witel Singaraja.The external context defines the external side of the organization that use PESTLE analysis at PT Telkom Indonesia Tbk Witel Singaraja.The context of risk management concerns how risk management is implemented and how it will be implemented in the future. In this case, risk identification, risk analysis, risk evaluation will be carried out, and the output is risk treatment that can be carried out by PT Telkom Indonesia Witel Singaraja to overcome risks that may occur in this deployment project.In establishing risk management, the organization needs to define mutually agreed parameters to be used as risk criteria. In this case, the parameters used in risk management for the "STTF Project" access network deployment at PT Telkom Indonesia Witel Singaraja are finance, legal, environmental, and operational.

3.2   Risk Identification

[3] Risk identification is the process of finding, recognizing and recording risks. The purpose of risk identification is to identify what might happen or what situations might exist that might affect the achievement of the objectives of the system or organization. Interviews in the context of data collection were carried out to 5 people who were included in the stakeholder access network deployment "STTF Project". Each respondent has a different role so that they can provide various points of view in the course of this project. Each respondent was individually interviewed using an online conference platform while answering questions about the project's risks. After conducting internal analysis, external analysis, and interviews with stakeholders, risk identification was carried out on the access network deployment of the STTF Project. Positive and negative risks related to the STTF project's work have been identified during the risk identification process. However, the author only examines negative risks in this final project because it discusses minimizing negative risks in the project. There are 19 identified risks on financial, legal, environmental, and operational factors can be seen on Table 1.

Table 1. Risk Identification

Type of Risk	Risk Index	Risk Description	Source
Finance	F1	The project does not receive PED TR5 approval due to exceeding the allocated budget	In Depth Interview
	F2	The project does not receive PED TR5 approval due to improper investment feasibility analysis	In Depth Interview
	F3	An increase in the cost of materials due to inflation	In Depth Interview and PESTLE Analysis
Legal	L1	The project does not receive local government approval	PESTLE Analysis
	L2	Changes in local government regulations	PESTLE Analysis
Environmental	E1	Rejection by local residents (community case)	In Depth Interview
	E2	Natural disaster	PESTLE Analysis
	E3	Stolen material	In Depth Interview
	E4	Material vandalism	In Depth Interview
	E5	Fire during construction	In Depth Interview
Operational	O1	The survey data results are less accurate	In Depth Interview
	O2	A sudden change in design	In Depth Interview
	O3	Project work locations that are difficult to access	In Depth Interview
	O4	On-site worker accident	In Depth Interview
	O5	The material used does not match the specification (ex. material downgrade, size)	In Depth Interview
	O6	An error occurred during construction so it had to be disassembled	In Depth Interview
	O7	Delay in material delivery	In Depth Interview and SWOT Analysis
	O8	The work results are not in accordance with the plan	In Depth Interview

Type of Risk	Risk Index	Risk Description	Source
	O9	There is an issue after the approval of the handover	In Depth Interview

3.3   Risk Analysis

A risk analysis is conducted after the risk identification data has been obtained. This process aims to rank the identified risks in order of importance. It offers information that can be used to assess risks, make decisions about whether they should be managed, and choose the best strategies and methods for doing so. The Analytical Hierarchy Process (AHP) tool will be used for risk analysis in this study.[4] According to, Marsono (2014), AHP is a method for solving a complex unstructured situation into several components in a hierarchical arrangement, by assigning a subjective value to the relative importance of each variable, and determining which variable has the highest priority in order to influence the outcome of the situations.The AHP application strategy provides an effective method for addressing subjectivity and uncertainty that manifest themselves during project planning and execution processes, as well as for assisting in the solution of complex challenges. Two factors, the severity of the risk impact and the likelihood of the risk, can be used to determine the level of importance that was applied in the AHP analysis.The multi-level structure of AHP where the first level is the goal, followed by the criteria level, and sub-criteria level can be seen in the following Figure 1.

Figure 1. Hierarchy of Multi-level using AHP
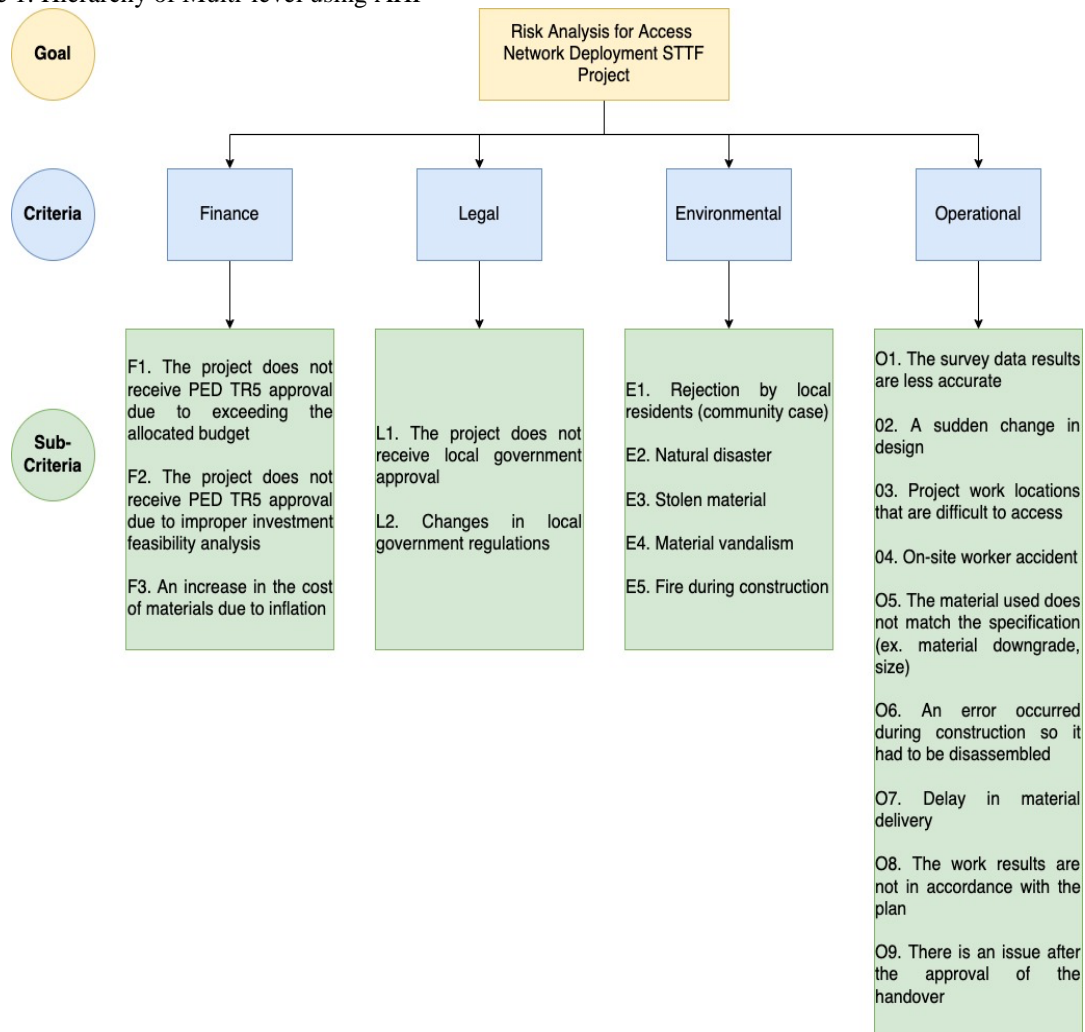
The primary objective of using AHP as a risk analysis process is to prioritize risks so that businesses can concentrate on managing the most critical risks. Ratings are also used to help determine the best risk response. The outcomes of risk assessments are used by businesses to plan risk reactions or tactical risk management actions. In order to produce an accurate risk rating, risk assessment techniques must be effective. One of the methods used at the moment to prioritize risk is the risk matrix using AHP.AHP also tests the

consistency of the assessment. The expected consistency is near perfect in order to produce a valid decision. The expected consistency ratio is less than or equal to 0.1. The risk analysis result using AHP shown at Table 2.

Table 2. Risk Analysis

Criteria		Sub-Criteria		Overall Weight	Rank
Type of Risk	Local Weight	Risk Description	Local Weight		
Finance	0.445	The project does not receive PED TR5 approval due to exceeding the allocated budget	0.188	0.084	3
		The project does not receive PED TR5 approval due to improper investment feasibility analysis	0.700	0.312	1
		An increase in the cost of materials due to inflation	0.112	0.050	5
Legal	0.111	The project does not receive local government approval	0.318	0.035	10
		Changes in local government regulations	0.682	0.076	4
Environmental	0.092	Rejection by local residents (community case)	0.160	0.015	17
		Natural disaster	0.128	0.012	19
		Stolen material	0.324	0.030	12
		Material vandalism	0.227	0.021	15
		Fire during construction	0.160	0.015	18
Operational	0.352	The survey data results are less accurate	0.124	0.044	7
		A sudden change in design	0.104	0.037	9
		Project work locations that are difficult to access	0.048	0.017	16
		On-site worker accident	0.071	0.025	13
		The material used does not match the specification (ex. material downgrade, size)	0.244	0.086	2
		An error occurred during construction so it had to be disassembled	0.066	0.023	14
		Delay in material delivery	0.097	0.034	11
		The work results are not in accordance with the plan	0.121	0.043	8
		There is an issue after the approval of the handover	0.125	0.044	6

3.4 Risk Evaluation and Treatment

It was discovered that each criterion and sub-criteria has its own weight based on the risk analysis in the previous sub-chapter. The output of these weights is the overall weight, which will be used to determine the priority ranking of each risk. The greater the overall weight value, the greater the importance of the risk. Vice versa. Therefore, in order to prevent project failure, the risk with the highest priority needs to be treated specifically. However, other risks must also be taken into account by taking the order of importance or priority into account.

Risk treatment is the process of determining specific actions taken with the aim of reducing the level of risk in order to avoid or reduce company losses.The risk treatment can be in the form of several forms of activity, which are Avoid by discontinuing the activity or pursuing a goal in which the risk to be avoided or avoided is inherent. Reduce, by carrying out certain activities in order to increase the effectiveness of the risk controls that we have or are currently running, both to reduce impact exposures and possible risk exposures. Transfer by sharing risk exposure with other parties. Accept, done by not doing a certain treatment of risk because the risk exposure is in accordance with the risk appetite of the organization. Generally, risk treatment in this form leads to sufficient monitoring activities that need to be carried out on the movement or change in the risk exposure.The risk priority and risk treatment for the STTF project access network deployment can be seen in Table 3.

Table 3. Risk Treatment

Priority	Risk Index	Risk Description	Action	Risk Response Plan
1	F2	The project does not receive PED TR5 approval due to improper investment feasibility analysis	Risk Avoidance	Redesign to accommodate the necessary quantity of demands
2	O5	The material used does not match the specification (ex. material downgrade, size)	Risk Reduction	Strict field supervision throughout the delivery of materials to the site and the installation process
3	F1	The project does not receive PED TR5 approval due to exceeding the allocated budget	Risk Reduction	Work on projects in accordance with the budget based on the List of Project (LOP) priorities
4	L2	Changes in local government regulations	Risk Avoidance	Coordinate with the local government on a regular basis during the construction planning and implementation stages
5	F3	An increase in the cost of materials due to inflation	Risk Acceptance	Preparing reserved funds in case it's needed to handle unforeseen circumstances
6	O9	There is an issue after the approval of the handover	Risk Transfer	Make an agreement regarding the 60-day warranty period following the official handover of the work and will cover any damage due to installation mistakes and poor material quality
7	O1	The survey data results are less accurate	Risk Reduction	Performing a comprehensive cross-check of the data during the Aanwijzing process
8	O8	The work results are not in accordance with the plan	Risk Reduction	Strict field supervision (in-process inspection) during construction, carried out by qualified supervisors
9	O2	A sudden change in design	Risk Reduction	Prepare a thorough plan using accurate field data

Priority	Risk Index	Risk Description	Action	Risk Response Plan
10	L1	The project does not receive local government approval	Risk Avoidance	Ensure the planning proposal complies with the rules established by the local government
11	O7	Delay in material delivery	Risk Reduction	Make an agreement in the cooperation contract about the deadline for the project's completion, along with a penalty that will be assessed if it is not completed within the stipulated time
12	E3	Stolen material	Risk Reduction	Conduct construction surveillance patrols and work with the local police to ensure security
13	O4	On-site worker accident	Risk Reduction	Ensure that the work is done in accordance with Standard Operating Procedures, personal protective equipment is worn, and that first aid supplies are prepared on the job site
14	O6	An error occurred during construction so it had to be disassembled	Risk Reduction	Strict field supervision (in-process inspection) during construction, carried out by qualified supervisors
15	E4	Material vandalism	Risk Reduction	Conduct construction surveillance patrols and work with the local police to ensure security
16	O3	Project work locations that are difficult to access	Risk Reduction	Marking locations that are difficult to access when conducting surveys and develop plans regarding alternative modes of transportation that can be used
17	E1	Rejection by local residents (community case)	Risk Reduction	Approach and obtain permission from local residents before undertaking the project
18	E5	Fire during construction	Risk Reduction	Prepare fire extinguishing equipment and perform work in accordance with Standard Operating Procedures
19	E2	Natural disaster	Risk Acceptance	Monitor BMKG updates and temporarily stop projects in areas where there are disaster warnings or signs

IV.   CONCLUSION

Access Network Deployment "STTF Project" affects PT Telkom Indonesia Witel Singaraja's incremental revenue significantly and is made up of numerous business processes that involve numerous stakeholders. These elements demonstrate how the process in the project is extremely complex and requires risk management to minimize risk so that PT Telkom Indonesia Witel Singaraja's project objectives can be fulfilled with measurable obstacles.

Through internal analysis using the SWOT analysis framework, external analysis using the PESTLE analysis framework, and in-depth interviews with several key stakeholders, risks were identified. Semi-structured interviews were conducted to examine potential risks that might emerge during project planning and execution. According to the findings of risk identification, there are 19 risk events related to the STTF project's access network deployment that are divided into four categories: financial risk, legal risk, environmental risk,

and operational risk.

According to the results of the risk analysis, the category with the highest weight is financial risk, followed by operational risk, legal risk, and environmental risk. The 19 identified risks are then given a risk priority.

For 19 identified risk events, this research proposes risk treatment in the form of a risk response plan. 13 risk events were proposed to be reduced or mitigated, 3 risk events were proposed to be avoided, 1 risk event was proposed to be transferred, and 2 risk events were proposed to be accepted.

ACKNOWLEDGEMENTS

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