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RESPONSE PLANNING ANALYSIS IN PROJECT RISK MANAGEMENT OF TELECOMMUNICATION TOWER CONSTRUCTION

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Abstract

In every project activity we will find number of risks, each with different probabilities and severity levels prior to the achievement of the project's goal. Project team is expected to be able to identify carefully and thoroughly every project activity. One of the methods applicable in identifying project risk is by identifying and grouping project risks using *Work Breakdown Structure* (WBS).

Based on the WBS that comprises of 103 activities, there are 32 high level risks, 37 medium level risks, and 20 low level risks. The identified risks then ranked based on treatment priority list from the probability – impact matrix so that then be obtained a list of risk priority. This list comprises of 32 high level risks and 7 medium level risks. In general, every activity in a project lines in a sequence. This interrelationship might allow a risk treatment activity to deal with the treatment of more than one existing risks in the project. In contrast, a single risk might be treated by several risk action activities. In order to find the most effective treatment activities to apply to the project risks, the source of the risks along with the risks' interrelationship will need to be defined by using risk interrelationship analysis.

Finally we can get a total weight of every treatment activity alternatives from the analysis of the project's critical path combined with *House of Quality* (HOQ). Based on the project critical path analysis and the HOQ approach, this research came to the finding of 11 major treatment activities sorted by the priority to be chosen and taken.

Keywords: Risk management, Work Breakdown Structure, House of Quality, Project risk, Telecommunication

1. Introduction

Nowadays, information and communication technology rapidly grow. It had been motivating companies to perform their competitive advantage by offering the best service for their customer. Network range or signal strength has been one major factor for customer satisfaction that needs to be fulfilled by operators.

This issue drives operators in telecommunication industry to broaden their communication network range of service. This can be achieved by building communication towers in places from population centers to rural areas. Nevertheless, the need of a significantly large amount of time and cost has led telecommunication business operators to apply an effective and efficiency based business decision; that is to outsource the building of communication towers. This shift in industry has caused the emergence of new communication tower building companies.

Along with the advancement of communication technology, there has been a significant increase in the demand of telecommunication tower building from operators. This increase of demand may not only offers company with increased revenues but also face the company to the quality issue, that is as a company that puts customer satisfaction as one primary concern, could company keep its product and service quality steady or even improve it. Customer satisfaction can be achieved if the company applies well managed project and risk management in the planning phase and the implementation phase of their projects. This is the reason that bases the need of risk management implementation by company's management to support the company's telecommunication tower building projects.

In other words project may never be separated from its risk. Because of this a well managed risk management is a must in a project management. Elkington and Smallman found that there is a strong link between the amount of risk management and the level of project

success; more successful projects use more risk management [1].

Company need to be able to identify, analyze, and measure every probable risk and design several effective risk treatment strategies prior to the relevant risks. This may be done to allow company to improve its profits through the increase in positive impact events probability and the decrease in negative impact events probability in every project. The ability to identify potential risks and to take steps to avoid them are two of the most important aspects of good project management [2].

2. Research Method

Generally, this research consists of five steps – risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning and risk monitoring and control. There are 3 methods using in data collecting. They are interviewing project team to identify risks in each project activity; propagate questioner to determine risk level; and brainstorming with the project team to determine the best risk response planning that should be taken.

The first step of this research is identifying risk to find out risks that possibly occur in each project activity. Risk identification was conducted by interviewing and document reviewing. Identified risk would be categorized by using *Work Breakdown Structure* (WBS) method. Risk is categorized based on the project activities where they occur. The primary outputs from this step are risks event, source of risks and risks impact.

Outputs from the risk identification will be used as input on qualitative risk analysis. Qualitative risk analysis assesses the priority of identified risks using their probability of occurring, the corresponding impact on project objective if they occur. Risk level is determined by multiplying level of probability and risk impact. We have propagated questioners for *director of tower, general manager* from each division, and *manager* form each department to find level of probability and impact of identified risk.

Level of probability and impact are determined according to responder's opinion on those questioners. Level of probability consist of five levels those are "almost certain", "likely", "possible", "unlikely", and "rare". Numerical scales assign values to these probabilities. These values are 5, 4, 3, 2, and 1 [3]. The impact scale reflects the significant of impact on each project objective if a risk occurs. Relative scale for impact consists of "extreme", "critical", "major", "minor", and "insignificant" that represent numeric scale values of 16, 8, 4, 2, and 1 [4]. Risks are prioritized according to their potential implications for meeting the project's objective. The typical approach to prioritizing risks is to use a probability and impact matrix below.

Probability and impact matrix categorizes risks into high risk (dark gray area), medium risk (medium gray area) and low risk (light gray area). The risk categorization helps guide risk responses. For example, risk that is in the high risk (dark gray) zone of the matrix may require priority action and aggressive response strategies. There are 39 major risks in telecommunication tower construction project based on result of questioner.

Risk Level			Impact				
			Insignificant	Minor	Major	Critical	Extreme
			1	2	4	8	16
Probability	Almost certain	5	5	10			
	Likely	4	4	8	16		
	Possible	3	3	6	12		
	Unlikely	2	2	4	8	16	
	Rare	1	1	2	4	8	16

Figure 1. Probability and impact matrix

Table 1. Major risk in telecommunication tower construction project

Risk ID	Risk Level
SA7a	56.00
SA6a	53.33
SA7b	53.33
CR4a	48.00
CR4b	48.00
CR1c	34.67
CR3a	34.67
PM1f	34.67
PM2a	34.67
PM1c	32.00
PM2b	32.00
CR3b	30.67
SA1a	30.67
PM3.1a	29.33
PM1l	28.00
SA10a	26.67
PM3.1b	26.67
CR1a	25.33
L2c	25.33
L1b	24.00
PM1h	24.00
L1d	22.67
PM3.3b	22.67
SA1d	21.33
L3b	21.33
SA8a	20.00
SA10b	18.67
L1c	18.67
PM1d	18.67
ED2.1a	17.33
PM1a	17.33
PM4.2a	17.33
SA4b	16.00
SA8b	16.00
SA1b	14.67
SA6b	14.67
L1a	14.67
PM1g	14.67
PM3.4b	14.67