

## PLANNING CONCEPT OF RISK MANAGEMENT IN CONSTRUCTION PROJECT

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### ABSTRAK

*Construction project has many risks; therefore it should be managed correctly and implemented from start to finish. Risk management is the correct way to minimize the risk in construction project. In the context of managing risk, people in construction company can analyze the risk that may happened with SWOT analysis as a tool to observe and determine strategy.*

*Keyword: SWOT analysis, risk management, construction project*

## 1. Background

Construction business is one of prospective business in Indonesia due to the increasing of infrastructure development. The development of infrastructure project in Indonesia attracts many foreign construction companies come to Indonesia to take the opportunity in getting construction project. Since 2010, there were 195 foreign construction companies have come to Indonesia; the number is getting higher in 2014 with 295 companies (Berkah, 2015).

In the context of construction business, this business has a very good prospect because the opportunity to get construction project is opened widely; in the other hand this business has a very complex characteristic, dynamic and needs feed back (Uher and Loosemore, 2004). The problem in construction are not only relate with time, money and quality but also participant cooperation in construction project. Therefore, the result of construction project may negative or positive (PMBOK, 2008). In line with the complex problems in construction project, contractor should has ability in managing risk because risk in construction project can not be avoided. According to Winch (2002) and Potts (2008), risk management is an very difficult area to be implemented because it must be implemented from start until finish.

One of construction compay that never implemented risk management was CV. Cahaya Bangunan Kontraktor. Therefore, this company will face many threats which has negative impact for further company development. Thus, to minimize the risk problem for CV. Cahaya Bangunan Kontraktor, this research will focus on risk management using SWOT analysis. Problem statements for this research are as follow: How to make evaluation of priority on risk management in construction business using SWOT analysis? How to make an improvement of planning concept of risk management in construction business using SWOT analysis?

## 2. Theory

Construction is one of services business that has a life cycle of production process. According to Smith et al (2006) the scope of project life cycle is depend on the location, factors and environment in construction project. The uniqueness in construction projects appear in every location because each location has different characteristic and should be solved inline with the condition. Therefore, risk in construction is influenced by many factors. According to Westland (2006) risk in construction should be identify with tools. The functions of tool are to track and control the risks. Ward and Chapman (2003) added that risk management in construction should be implemented in every step of project life cycle from start to finish. According to Risk Analysis and Management for Projects (RAMP) (2005) risk management in the construction project management is a comprehensive and systematic way to identify, analyze and respond of risks to get the perfect project result.

According to Clemons and Simmons (1998), risk management is conducted with the following systematic way, namely identity concerns, identify risks & risk owners, evaluate the risks as to likelihood and consequences, assess the options for accommodating the risks, prioritize the risk management efforts, develop risk management plans, authorize the implementation of the risk management plans, track the risk management efforts and manage accordingly.

## 3. Research Method

This research was conducted with qualitative approach. This research was started with identification of risk management, then risk assessment with SWOT analysis. This research will use SWOT as a tool to organize data, determine the result and make strategy on risk management especially in CV. Cahaya Bangunan Kontraktor. The

respondents for this research were taken from employee of CV.Cahaya Bangunan Kontraktor because in the SWOT analysis the respondents are the people who knows about the problem and the people who has opportunity to give decision making in the organization.

#### 4. Result and Analysis

##### a. CV. Cahaya Bangunan Kontraktor

CV. Cahaya Bangunan Kontraktor never used risk management before because the employee and founder of CV. Cahaya Bangunan Kontraktor do not know about risk management in construction project. The explanation in running construction project of CV. Cahaya Bangunan Kontraktor is as follow:

###### 1. Technical affair

In terms of technical affair, the weakness are located in the incomplete of the risk management determination and limited number of high quality architects. In the context of risk management determination, this company has a very weak determination on managing risk, both risk of accident and risk of budget. Moreover, another risk determination that never been thought is risk of budget, include the risk of inflation.

###### 2. Human resource and development affair

In the context of human resource and development affair, the weakness is located in the knowledge of employee. The employee of CV. Cahaya Bangunan Kontraktor are rarely to have workshop about construction. They know about the development about construction industry by self learning with their friends from outside of company because CV. Cahaya Bangunan Kontraktor has very limited budget on supporting workshop for employees.

##### b. SWOT Result and Calculation

This research used 33 people as respondents. The respondents were chosen from their power in decision making in CV. Cahaya Bangunan Kontraktor, therefore their idea will be determined as a concept of risk management in CV. Cahaya Bangunan Kontraktor.

##### 1. Evaluation of Internal Factor

Based on the observation and result of questionnaire, it can be seen that the internal factor which has effect on CV. Cahaya Bangunan Kontraktor for risk management are as follow:

###### i. Strength

**Table 1 Strength Table of SWOT**

No	Strength	Score	Urgency (Rating)	Weight (%)= (score/Total Xs* Ws)	Weight*Rating
1	2	3	4	5	6 = 4*5(%)
1	Company vision that can be guidance on construction work.	3.5	4	3.7	0.15
2	Company mission that can be guidance on construction work.	3.2	3	3.4	0.10
3	Company Objective that can be guidance on company planning.	2.7	4	2.9	0.12

No	Strength	Score	Urgency (Rating)	Weight (%)= (score/Total Xs* Ws)	Weight*Rating
1	2	3	4	5	6 = 4*5(%)
4	Director of company who has duty to lead.	3.2	4	3.4	0.14
5	Managers who has responsibility in every division.	2.7	4	2.9	0.12
6	Enough amount of staff in every division.	2.6	3	2.7	0.08
7	Standard Operating Procedures in every step of work.	3.4	3	3.6	0.11
8	Complete construction equipment.	3.3	4	3.5	0.14
9	Scheduled construction equipment maintenance	3.2	4	3.4	0.14
10	Standard Operating Procedures on construction equipment use.	3.6	4	3.8	0.15
11	Enough quantity of masson.	2.7	4	2.9	0.12
12	Enough quality of masson.	2.4	3	2.5	0.07
13	Material quality by request of customers.	2.3	3	2.4	0.07
14	Enough capital of company	3.2	4	3.4	0.14
15	Good quality of Architech, that graduate from high quality university.	3.6	4	3.8	0.15
16	Enough amount of architech.	2.8	3	3	0.09
	Total score (Xs)	48.4			1.89
	Total Xs + Xw			94.6	
	Ws = (Xs/Xs+Xw)*100			51.163	

Source: SWOT Calculation (2016)

Based on the strength of CV. Cahaya Bangunan Kontraktor, the most important thing to manage risk in construction company is vision because vision is the core value of company. Moreover, the vision of company should be supported with the standard operating procedures for all of work. The existing of standard operating procedures can maintain the quality and supervision of work and minimize the mistakes during the work.

ii. Weakness

Table 2 Weakness Table of SWOT

No	Weakness	Score	Urgency (rating)	Weight= (score/Xw* Ww)	Weight*rating
1	2	3	4	5	6 = 4*5(%)
1	Construction work in Kendal often disturbed by natural disaster including flood.	2.2	3	2.3	0.07
2	Many broken equipment due to wrong used	2.4	3	2.5	0.07
3	Dishonest employee.	2.0	3	2.1	0.06
4	High number of construction accident	1.8	3	1.9	0.06
5	Material theft by employee.	2.2	3	2.3	0.07
6	Material theft by people around construction area.	2.3	3	2.4	0.07
7	Less quality of material due to wrong kept.	2.2	4	2.3	0.09
8	Inflation.	2.4	4	2.5	0.1
9	Late payment will influence the stability of construction work.	3.0	3	3.2	0.09
10	Cheap tender of construction.	3.1	3	3.3	0.1
11	Delay of construction permit due to long procedures inside construction company.	2.3	4	2.4	0.1
12	Illegal budget allocation often appear in construction work implementation.	3.1	3	3.3	0.1
13	Sound pollution due to construction work often be complaint by people surrounding	3.2	3	3.4	0.10
14	Incomplete design on construction planning.	2.8	3	3.0	0.09
15	Design change	2.1	3	2.2	0.07
16	Incomplete specification	2.2	3	2.3	0.07
17	Not enough labour productivity	2.0	3	2.1	0.06
18	Wrong prediction of climate.	2.5	3	2.6	0.08
19	Wrong work on construction.	2.4	3	2.5	0.07
	Total score (Xw)	46.2			1.52
	Total score of Xs + Xw			94.6	
	Ww = (Xwi/Xs+Xw)*100			48.84	

Source : SWOT Calculation in 2016

Based on the calculation of weakness as sub factor, it can be seen that the weakness that need to be determined seriously are the decrease of material quality due to the wrong kept, inflation and change of regulation. The decrease of material quality should be determined seriously by developing better storage for material because the quality of material is the most important thing in construction business. The customers can make a complain regarding to the quality of material. Moreover, in terms of inflation, this case can not be predicted previously because the inflation happend depend on the country situation. Therefore, the manager of CV. Cahaya Bangunan Kontraktor should be aware about the situation that may happend in

Indonesia because it can influence the profit of business. Last but not least, the change of regulation is also can give an impact to the company success because the building construction will relates with the government site plan.

## 2. Evaluation of External Factors

### iii. Opportunity

**Table 3 Opportunity Table of SWOT**

No	Opportunity	Score	Rating	Weight= (Score/ Xo*Wo)	Weight*Rating
1	2	3	4	5	6 = 4*5(%)
1	Customers' satisfaction	3.5	4	10.4	0.42
2	Increase number of customers	1.7	3	5.1	0.15
3	Low number of construction accident	3.4	4	10.1	0.40
4	Decrease company expense on construction work accident.	3.4	4	10.1	0.40
5	Avoid of law case.	2.5	2	7.5	0.15
6	Work satisfaction due to good prediction on risk.	1.3	3	3.9	0.12
	Total score (Xo)	15.8			1.63
	Total Xo + Xt	33.5			
	Wo = (Xo/Xo+Xt)*100	47.16			

Source : SWOT Calculation in 2016

The opportunity that can be obtained if the construction has risk management are customers' satisfaction, low number of construction accident and decrease company expense due to work accident.

### iv. Threat

**Table 4 Threat Table of SWOT**

No	Threat	Score	Rating	Weight= (score/Xt*Wt)	Weight*Rating
1	2	3	4	5	6 = 4*5(%)
1	Decrease the number of customer	3.4	3	10.1	0.30
2	Bankrupcy	3.6	4	10.7	0.43
3	Lose on business competition.	2.1	3	6.3	0.19
4	No trust from customers.	3.7	4	11	0.44
5	No business tender.	2.2	2	6.6	0.13
6	Increase number of jobless people	2.7	3	8.1	0.24
	Total score (Xt)	17.7			1.73
	Total Xo + Xt	33.5			
	Wt = (Xt/Xo+Xt)*100	52.83			

Source : SWOT Calculation in 2016

Based on the calculation of sub external factor, namely threat, it can be seen that the respondents who has power to make decision have a great focus on bankrupcy and no trust from customers if CV. Cahaya Bangunan Kontraktor has no



risk management. Therefore, the strategy and priority that will be made about risk management will be discuss in the analysis.

**c. Analysis**

In SWOT analysis, the decision maker is not only use internal strategy or external strategy to solve the problem, but the decision maker use combination between internal factors and external factor which can be determined by IFAS and EFAS table.

**Table 5 Weighting SWOT Questionnaire Result Summary**

	Strength = 1.89	Weakness = 1.52
Opportunity = 1.63	SO = 3.52	WO = 3.15
Threat = 1.73	ST = 3.62	WT = 3.25

Source : SWOT Calculation in 2016

Based on the calculation, the quadrant for strength and threat strategy is located in Quadrant III, it means that the system has good opportunity but has an internal weakness. The correct strategy for this system is minimize internal problem to get external opportunity. Therefore the strategy that should be conducted firstly is the strength-threat strategy as action plan. The action plans are as follow:

1. Socialize the company vision to avoid no trust

The strategy that should be choose by CV. Cahaya Bangunan Kontraktor is socialize the vision. According to Robbins and Judge (2003) vision is the core value of the company or organization, therefore all of people in the organization should know and understand about vision. The vision will be described by mission and has operational conduct in objective. The vision of CV. Cahaya Bangunan Kontraktor is *Menjadi Partner Terpercaya Dalam Konstruksi Bangunan Di Kendal Tahun 2025, To Be The Most Trustful Of Construction Building In Kendal By 2025*. Therefore, it can be described in mission and objective. In the context of this research, the company has no risk management determination because the people only depend on standard operating procedures (SOP), but they never thought about threat that may happend during construction work. Therefore, to decrease risk factors, the owner, director, manager of this company should have the same prediction about risk that can be happend in construction company like CV. Cahaya Bangunan Kontraktor. According to Enshassi and Mayer (2001), risk management has 4 steps, namely:

1) Risk identification

In terms of risk identification, the owner, director and manager should know about the risk and threat both internal an external factor. As mentioned before, the risk that may happend in CV. Cahaya Bangunan Kontraktor are as follow flood, broken equipment, dishonest employee, construction accident, material theft by employee, material theft by people, quality decrease of material, inflation, low rate of Rupiah, cheap tender, change of regulation, pollution, incomplete design, lack labour productivity, wrong prediction and wrong work

## 2) Risk analyze

In the context of risk analysis, this company already has the concept to make priority with SWOT. According to SWOT calculation, the priority to overcome risk management problem is strength-threat. This company has the strength that can be a support for construction business, then this company use the strength to minize the threat.

In terms of threat, CV. Cahaya Bangunan Kontraktor has 6 points categorized as threat, namely decrease number of customers, bankrupt, lose of business, no trust, no tender, increase number of jobless.

The first point of threat is decrease number of customers. This point is related with no trust of customers due to the bad quality of construction building. This point is the most dangerous threat for construction company. Recently, customers more aware about safety of construction project. Second point of threat is bankrupt. According to the Director of CV. Cahaya Bangunan Kontraktor, bankrupt in construction companies happen due to many factors, such as mismanagement, lack of customers or no tender, and no income. Therefore, to avoid bankruptcy in CV. Cahaya Bangunan Kontraktor, this company has action plan namely implement Standard Operating Procedures. The implementation of Standard Operating Procedures should be inline with vision, mission and objective of company. The third point of threat is increase the number of jobless. Jobless is the worse threat in business effect. Therefore to avoid jobless in construction company, quality of work should be inline with customers' need. The way to maintain customers' need is use customers' satisfaction standard.

## 3) Risk response

In terms of risk response, it can be implemented with the willingness of the people in CV. Cahaya Bangunan Kontraktor to do the strategy that already obtained through the SWOT calculation, namely maximize the strength to minimize the threat. The way to maximize the strength is maximize the items identify in the strength factor, as follow company vision, company mission, company objective, director duty, rResponsibility manager, enough staff, SOP of work, complete equipment, SOP of equipment, quantity of masson, quaity of masson, material quality, enough capital, quality of architech and quantity of architech

## 4) Risk control and monitoring

The next step in promoting risk management is risk control and monitoring. This work are the duty of managers, and director. In the context of management, the leader is not only direct the work but also monitor and control his subordinate, therefore the director and managers in CV. Cahaya Bangunan Kontraktor also have the same duty. The most effective guidance on controlling and monitoring is the use of standard operating procedures.

## 2. Improve SOP to increase the number of customers

CV. Cahaya Bangunan Kontraktor already has standard operating procedure (SOP). This standard is a guidance and route map of construction work, both in the management side and construction side. The director and manager should understand the procedure well because the complete procedure will decrease mistake during work.

## 3. Increase customers' satisfaction to avoid jobless

In the context of construction work, the customers' satisfaction can be obtained through the linearity between planning, implementing and suprvising about construction work. Take an example, the customers will build a building, therefore



CV. Cahaya Bangunan Kontraktor as a construction company will make a planning about the construction. The company will make term of reference, budget plan and feasibility study. After that, the contract will be signed by the company and customers, then the work will be started. In the contract, the customers and contractor will make an agreement about cost, budget, material and time to finish the work. The customers will be satisfied when the company can fulfil the agreement of cost, budget, material and time. In the other hand, the customers also should be meet the agreement about the payment, because the delay of payment will influence the time to finish construction. Moreover, the customers also should not change the feasibility study, material and model to avoid the delay.

## 5. Conclusion

The conclusion for this research are as follow:

1. CV. Cahaya Bangunan Kontraktor has priority in promoting risk management. This company has a good strength to minimize the threat, therefore based on SWOT calculation, the best strategy that should be implemented is strength-threat strategy with 3.62 point of weight. In terms of risk management priority strategy for CV. Cahaya Bangunan Kontraktor, the most important thing that should be conducted is socialize the vision of company to support all of the procedures of construction work both managerial and construction;
2. The planning concept of risk management of CV. Cahaya Bangunan Kontraktor are socialize the company vision to avoid no trust, improve SOP to increase the number of customers and increase customers' satisfaction to avoid jobless

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