

Lesson Learned Corrective Action in Internal Factors of Construction Company in Indonesia

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Abstract

In improving Indonesia construction companies' ability to compete, anticipative steps by determining various improvements and corrections in construction companies are needed to increase the company's quality performance. Several factors that influence and determine the success of a construction company can be grouped into internal factors, external factors, and market forces. Internal factors in a company are important factors and have the effect of approximately 42% towards the company's success. Management, equipment, human resources, corporate culture and finance dominate the internal factors' influence towards the success of a construction company. The research objective discussed in this paper is to identify the causes of internal factor problems in construction companies and their corrective action recommendations. Corrective actions are needed to fix the problems and it depends upon the cause and the effect of the problems in construction companies. The methods used are literature studies and survey to identify the problems including their effects and causes, also their corrective actions. Analyses used in this research are Statistical Analysis, Monte Carlo simulation and Delphi Method. The results show that the corrective actions towards the problems in internal factors which are mostly corrective action during construction process and lesson-learned corrective action (preventive action).

Keywords

internal factors, construction companies, corrective action

1. Introduction

The construction industry contribution in total Gross Domestic Product (GDP) of Indonesia is approximately 4%-8%. Actual data from Statistical Center Bureau (SCB) showed that industry sector with utilities and services sector are the prime contribution of GDP growth. Because of the recent economy depression, the company had suffered a heavy constraint from the tighter competition and the increase of obligation. Therefore, only the competitive company will be able to survive in the business.

The role of construction industry is increasing, but not optimum enough, where it can be seen from the fact that the market for foreign construction companies in Indonesia are still large, and also the national development process is still ineffective and inefficient. The role of construction industry can be viewed from the potential in job opportunities, material needed and its effects, public regulations that support the economy, and also the effects of construction industry's expansion toward the economy, income distribution for lower community (Lopez, 1997; Ofori, 1990). The research done by World Bank shows that construction sector in developing countries has important contributions and influence towards the national development (World Bank, 1984). This sector influences almost all of the economic sectors. Roads, dams, irrigation, housing, schools and other construction activities are the physical foundation for developing business and improving life standards. In most of the developing countries, improving construction's capacity and capability is important, including increasing cost and time efficiencies, and also the quality of the construction activity.

In facing the free-trade era, which was initiated by AFTA, APEC and other international commitments, a construction company in Indonesia needs to improve its ability to compete, where world economic globalization process provides the opportunity for international investors to expand their business in Asia, specifically in Indonesia. To face these competitions, anticipative steps by determining various improvements and corrections in construction companies are needed to increase the company's quality performance. Improvements and corrective steps in a construction company can be a control system towards factors that influence the construction company's success, which happened beyond planning.

The standard of a company's success can be shown from its performance. The better the performance of a company, the more successful the company can be. The performance indicator of a company can be shown from its profitable, growth, sustainable, and competitive performance.

Several factors that influence and determine the success of a construction company can be grouped into internal factors, external factors and market forces (Wideman and Myers 1992). Internal factors in a company are important factors and have the effect of approximately 42% towards the company's success. Management, equipment, human resources, corporate culture and finance dominate the internal factors' influence towards the success of a construction company.

This paper discusses the problems arised in the internal factors which affect Indonesia's construction company's performance, and also elaborate the corrective action recommendations that can improve its performance. This topic is part of a study that aims to create and develop a computer system based on knowledge base management system which has the ability to provide several solution and recommendation alternatives such as corrective action towards problems arised from the construction company in Indonesia.

2. Construction Company in Indonesia

Construction industry is an industry that involves all of the party relate to the construction process including profession experts, contractors, and also suppliers which together fulfill the needs of industry stakeholders (Hillebrandt 1985). Construction is a service that produces physical infrastructures. The services consist of feasible study activity, planning and design, construction and supervision, and maintenance. Understanding that physical infrastructures are the base of growth sectors in national development and also the fact that construction industry service plays the role as a job provider, therefore construction industry is an important aspect in national development (Suraji 2003).

Before the monetary crisis occurred, construction sector had a fantastic growth. Thus no wonder if this sector is called as the main driven economic development. However, based on data from World Bank, *Averthing Infrastructure Crisis: A Frame Work Policy and Action*, after that crisis, contribution of construction sector, especially infrastructure, towards the Gross Domestic Product (GDP) has a trend of decreasing which can be seen at Figure 1.

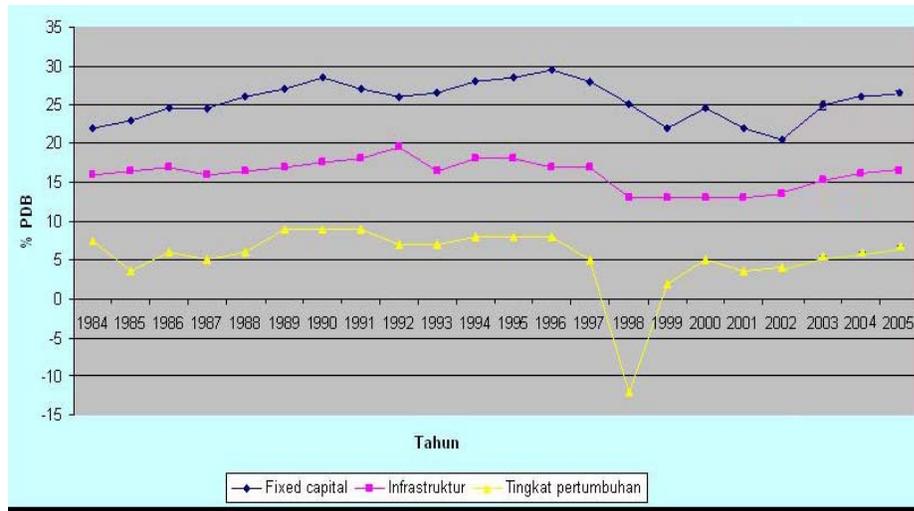


Figure 1: Construction Sector Contribution of Indonesian Total GDP

In order to attain a strong construction industry, which is needed to achieve a good growth, there are several issues that need to be performed. Conditions that are needed for a strong construction industry (Kadin, 2002) are: a sufficient number of professional management and skilled human resources; nationally standardized materials and produced within requirements; construction equipments are procured effortlessly and competitively; a proper and open information system, starts from the project conception to bidding process; awareness of the most recent and efficient construction methods, hence can be exceptional in international bidding.

3. Internal Factor Problems in Construction Company

As one of the important sectors in economic development, the problems in construction industry that influence company's performance need to be concerned. Generally, construction industry in developing countries has typical problems in (Ofori, 1998): High capital import; Labor and material inefficiencies; High exchange value of currencies, except from import taxes and low interest in capital import and capital-intensive production; Low skills and material, including the managerial and entrepreneurial ability; Financial weakness and delay of payments; weakness of planning and administration system; foreign contractors dominations and low capacity from the local contractors; Inaccurate target achieved through social-economic planning that affected job flow disorders, inefficiencies, and low quality products.

Indonesia, as a developing country is also experiencing problems described above. Other major problems in Indonesian construction companies include: bad personal mental and behavior (Pranoto 2005) ; low competitiveness with foreign contractors caused by constraints in fund and technology (Sutjipto 1991) ; public awareness of the benefit and importance of construction industry needs to be developed (Trisnowardono 2002).

4. Performance Indicators of Construction Company

The standard of a company's success, particularly a construction company, can be shown from its performance. The better the performance of a company, the more successful the company can be. The indicator of a successful company can be shown from the company's ability to gain profit (profitable) (Team 2004b), the ability to grow and develop (growth) (Albach 1965; Drucker 1994), the ability to

obtain projects continuously and sustain (sustainable) (Team 2004a), and also last but not least is the ability to compete (competitive) with other companies, either foreign or local (Porter 2004).

Profitability is the company's ability to gain profit. Ram Charan (2004) describes that profit can be derived from the company's ROI (Return on Investment), which is the ratio of income and investments per outcome. Supporting this indicator, Fred R David (2002) states that the financial condition and performance of a company can be viewed from the financial ratio, which are: liquidity ratio, solvability ratio, profitability ratio, and growth ratio.

According to Albach (1965), the definition of corporate growth is the improvement (in the form of a positive change) of the company's size through a long term period. Whereas Drucker (1994b) describes that growth is a successful outcome, which provides what the market demands, uses economic and effective resources, creates profit for expansion, and managing future risks. Corporate / company growth is related with the life cycle of the company and its profitability. Growth can be achieved if suitable profit is gained continuously. From a broad definition, growth means market growth, products / services growth, and technology growth that are used to provide products and services. These kinds of growth often increase the company's competitiveness and profitability.

Sustainability is also called 'the triple bottom line' which involves the company to own a solid commitment towards economic, environment, and social objectives. Economic sustainability means to improve the profitability by using efficient resources, including labor, material, energy, and water. Environmental sustainability means to protect the environment from emission and waste impacts, and exploit the resources carefully. Social sustainability means to consider the stakeholders' needs (Team 2004a). Sustainability is a dynamic concept, not static. This concept is established through various intensive interactions between the company and its dynamic business environment. Sustainability is a result from series of incremental changes and efforts where together creates a large cumulative outcome (Kotler, et al 2003).

Competitiveness is the core of the company's success or failure. Competition determines the proper activities in a company that can give contributions towards its performance such as innovation, cohesive culture, or a good implementation. Competitive strategy is an effort to find a competitive position in the industry that intends to form a beneficial and sustainable position (Porter 2004). A complete definition of competitiveness is a business sector that is able to satisfy the customer's needs from a combination of products and services characteristics, able to satisfy its workers, and offers an interesting ROI including the potential to grow (Momaya and Selby 1998).

5. Research Method

This study is conducted by using survey approach towards Indonesian construction experts to identify the impacts of internal factor problems in Indonesian construction company toward its performance. The variables used in this study consist of internal factor problems, effects, causes and corrective actions variables. The relationship model between internal factors toward the construction company's performance used in this study can be seen at Figure 2. The data analysis method used is statistical analysis, which are correlation and regression analysis, where the internal factor problems which influence / affect its performance the most is identified. Besides using statistical analysis, Monte Carlo simulation is also used to perceive the company's performance level of success.

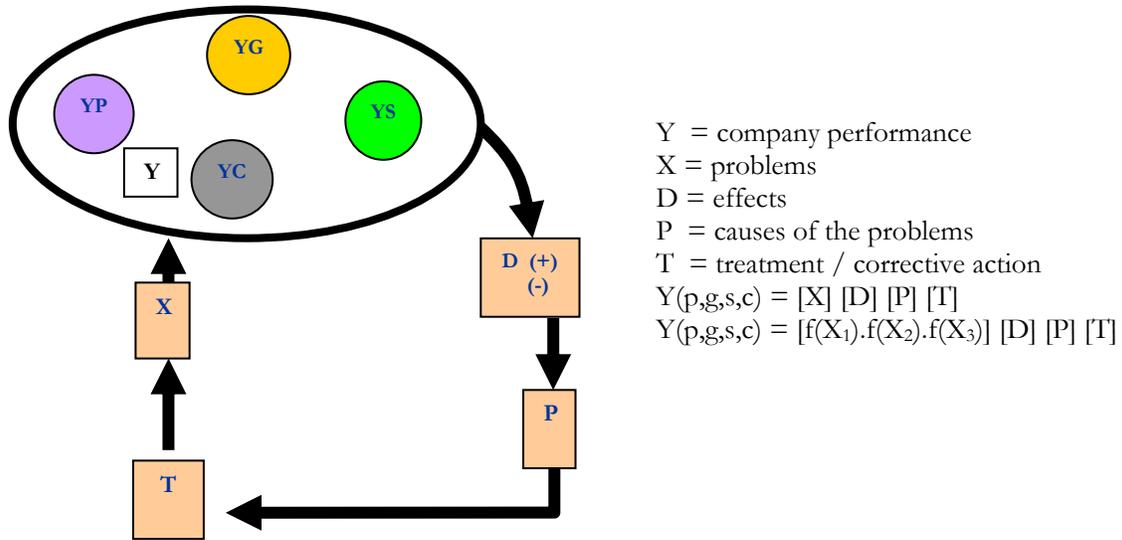


Figure 2: Variable Relationship Model

6. Research of Study

Based on the correlation and regression analysis, variable X (problems) which mostly influence the declining of construction company's performance are identified. Then, by using the regression formula, simulation process are conducted using Monte Carlo simulation with various scenarios where the level of the company's performance are detected. This can be seen at Table 1 below.

Table 1: Quality Value for Each Company Performance Indicator

Performance	Detailed Performance	Quality Value	
		Mean	Max
Profitable	Liquidity	2,754	6,742
	Profitability	3,088	5,323
	Growth	3,740	5,828
Growth	Profit	1,962	4,689
	Information Technology	3,923	5,632
	Human Resources Competence	1,816	3,396
Sustainable	Productivity	3,527	6,425
	Client Satisfaction	3,470	5,158
	Cost Efficiency	3,080	6,498
Competitiveness	Technology	5,019	7,02
	Cost	3,515	6,91
	Human Resources Competence	3,830	4,886

Based on Table 1, it can be seen that the optimum quality of a company's performance must be within the range of mean-max. If the company performance's quality is below the minimum value, this means the the company's performance is very bad, where it can cause bankruptcy. Meanwhile, if the quality value is above maximum level, it is also not a good condition because a very high performance can cause an over heating condition.

Based on this performance scale, the next step that must be done to improve the performance is implementing corrective action towards the cause of the problems. Corrective action data required in this research is obtained by performing open-ended interviews where experts give their opinion and solution if internal factor problems occur. Expert's corrective actions are gathered and divided into 2-3 sections, which are handed back using Delphi Method for expert's resolution. Expert gives their opinion by choosing 1 from 2-3 sections of corrective actions. Further more, statistical evaluation is conducted by observing the major priority chosen by the experts. Recommended corrective actions obtained from the study can be grouped as follows:

Table 2: Problems,Causes and Corrective Action Variables for Internal Factors

Problem		Cause	Corrective Action
MANAGEMENT			
X1	Inexperienced managers	Mistakes in recruiting inexperienced /unskilled workers	Improving skill and competence through trainings
		Minimum management training	Developing management and information system trainings for managers
			Applying a good,effective and efficient cadres system
			Executing a routine management discussion
X4	Leaders who don't have innovation and a clear mind set	Conventional leaders	Modifying products
		Resisting changes in markets and competitions	Comparing improvements towards typical companies
		Arrogant and superior attitudes	Benchmarking to other companies ,local and international
X6	Low level of managerial and entrepreneurial skill	Low level of human resources competence	Improving skill and competence through training
		Lack of managerial training	Creating HR program, such as work enrichment, flexible work hours, effective management, and worker's participation in increasing work quality
			Applying a good,effective and efficient cadres system
X7	Mistakes in managing corporate strategy	Company that doesn't have clear vision and mission	Establishing clear corporate vision and mission
		A weak corporate planning	Organizing corporate strategy plan, whether short, medium or long term
X8	Low level of human resources management	A weak resource allocation planning	Organizing a clear and proper human resources allocation plan, suits to the company's needs
		High level of import towards labors/workers	Using local competent labors/workers
X9	Ineffective communication system	Company leaders who don't have a clear mind set	Improving the cooperating skills in team work
		Low level of human resources competence	Establishing clear operation and procedure standards
		A complex corporate bureaucracy and procedures	
X10	Mistakes in delegating jobs and authorities	Incompetent leaders	Identifying worker's characteristics,and also their skills and abilities
		Unclear work structures and resource assignment lists	Determining a clear and documented operation and procedure standards

Problem		Cause	Corrective Action
			Delegating proper jobs and responsibilities that suits its skills
X12	Low quality of products	Lack of trained and skilled workers	Improving productivity, technology, innovation and company's services.
		No quality standard established by the company	Establishing quality standards for work outcomes
		Inaccurate target through social-economy planning	Measuring work outcomes routinely
		Lack of awareness in market changes, whether in domestic, regional, or global markets	
HUMAN RESOURCES			
X14	Low moral and ethics standard	Negative attitude and mind sets between HR	Applying reward and punishment system
		Poor HR planning and training programs	Improving worker's relationship, enriched with informal communication and motivation
		Inability in developing and motivating workers	Applying education and training that help to improve moral, ethics, and skills
X15	Low productivity	High cost of worker rotation	Conducting a routine education and training program
		Insufficient / no rewarding system	Applying reward and punishment system
		A bad worker's incentive and insurance program	Evaluating workers' performance regularly
X16	Lack of knowledge and technical skills in its HR	Poor training program and HR planning	Conducting a routine education and training program
		Inability in developing and motivating workers	Conducting workers' certification and establishing worker's competency standards
		Low level of HR professional certificate accreditation system	Evaluating workers' performance regularly
X17	Low creativity and innovation in its HR	Poor training program and HR planning	Conducting a routine education and training program
		Lack of technology usage	Improving HR's ability in applying technology and innovation through technology training
X21	Low leadership capability	Inability in developing and motivating workers	Improving skills and competence through training
		Poor training program and HR planning	Executing discussion and meeting regularly
			Improving ethics standard and a high integrity through leadership training
FINANCE			
X22	Poor corporate cash flow	Poor budget control	Applying good cost and quality control tools
		Lack of funding and high interest loans	Developing a good budgeting and repairing investment outcomes
		Poor corporate financial management	Renovate financial system and implement auditing regularly
X23	Poor financial problems and late payments	Poor budget control	Renovate financial system and implement auditing regularly
		Lack of funding and high interest loans	Developing knowledge in using local materials and construction techniques in order to minimize cost

Problem		Cause	Corrective Action
		Poor HR and inefficient management	Economizing cost through material usage efficiency
		Limited funds and technology	Reducing operational costs, resource consumption, and transportation costs
EQUIPMENT / MACHINE			
X24	Lack of supporting machine/equipment facilities	Poor equipment planning	Identify the needs and amounts of equipment and supporting machines
		Incapability in organizing supporting machine / equipment usage	Renovating existing facilities
			Innovating working system

7. Conclusion

Corrective actions are implemented toward the cause of the problems by regarding its effects (as a risk factor) whether the highest risk or the lowest risk, and also considering that those corrective actions are preventive and anticipative actions in order to decrease the internal problems in the construction company. To recommend a corrective action towards the problems arised, a comprehensive and thorough understanding of the problems must be obtained, thus the causes and effects of the problems can be identified and suit the real condition. Corrective action recommendation derived from the experts are based on existing events. They are also called preventive actions or lesson-learned corrective action.

The results of this study, which are the causes of the company's internal factor problems, risk ranking, and corrective action recommendation, are then arranged into a knowledge base which will be developed into a computer program based on knowledge base management system. The knowledge base management system prototype has the output of corrective action recommendation towards the cause of the internal factor problems, and depends on the effects that have the highest risk ranking. This means that risk level of the effects are considered in obtaining the proper corrective action.

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