

**KEY FACTORS THAT CAUSE THE DELAY AND LOSS OF  
WORK IN CONSTRUCTION BUSINESS**



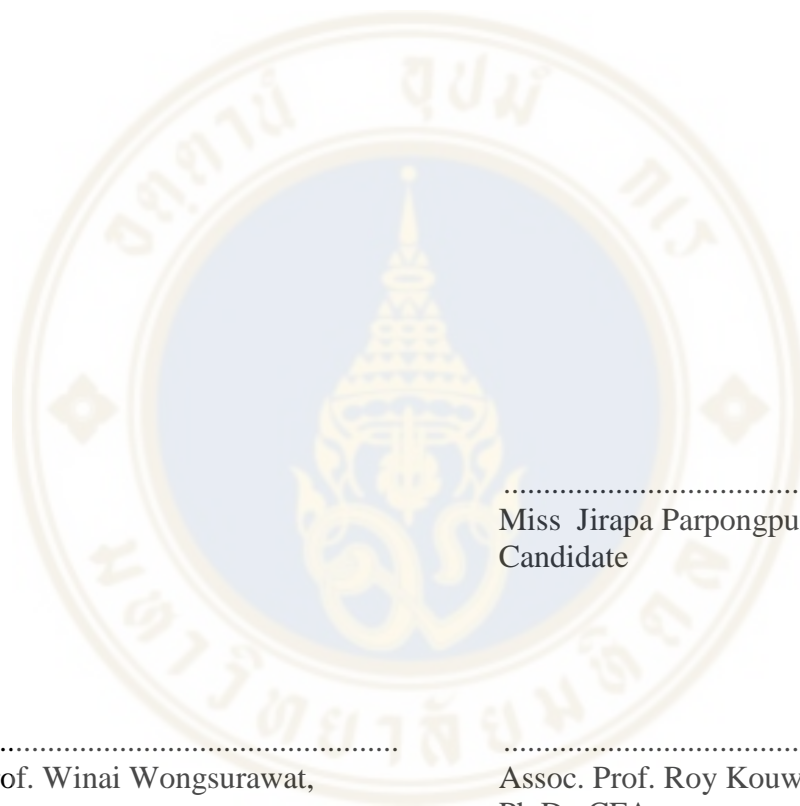
**A THEMATIC PAPER SUBMITTED IN PARTIAL  
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**KEY FACTORS THAT CAUSE THE DELAY AND LOSS OF  
WORK IN CONSTRUCTION BUSINESS**

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**KEY FACTORS THAT CAUSE THE DELAY AND LOSS OF WORK IN CONSTRUCTION BUSINESS**

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**ABSTRACT**

The Purpose of this paper is to find out what are the key factors that cause the delay and loss in construction business. The author used qualitative method to collect the primary data by depth-interview and observation from the existing project (refers as Project X in the paper). Also, the author collected data from 8 interviewees who involved directly to the company that work on the project X such as company employee, engineer, consultant, and project owner.

As a result, there are several issues occurred in the project X that had been identified in this thematic paper. However, most of the issues that has been found are the potential of project manager and cost management. The author expect that this paper will be helpful for people who interest in project management of construction business. The paper would reveal about management tools and the potential of project management.

**KEY WORDS:** Project Manager/ Cost Management/ Risk Management/ Construction

31 pages

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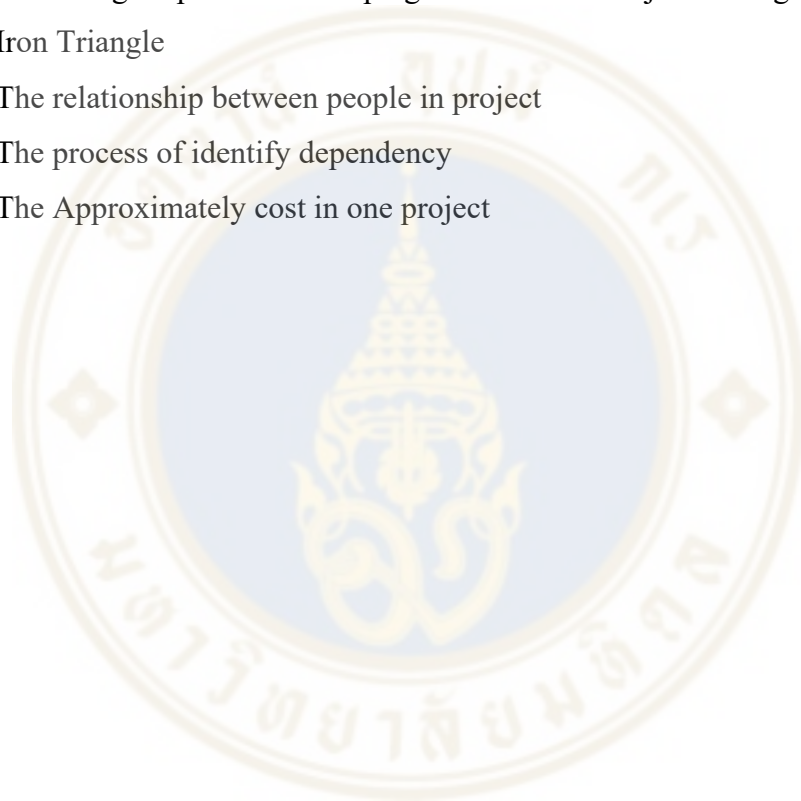
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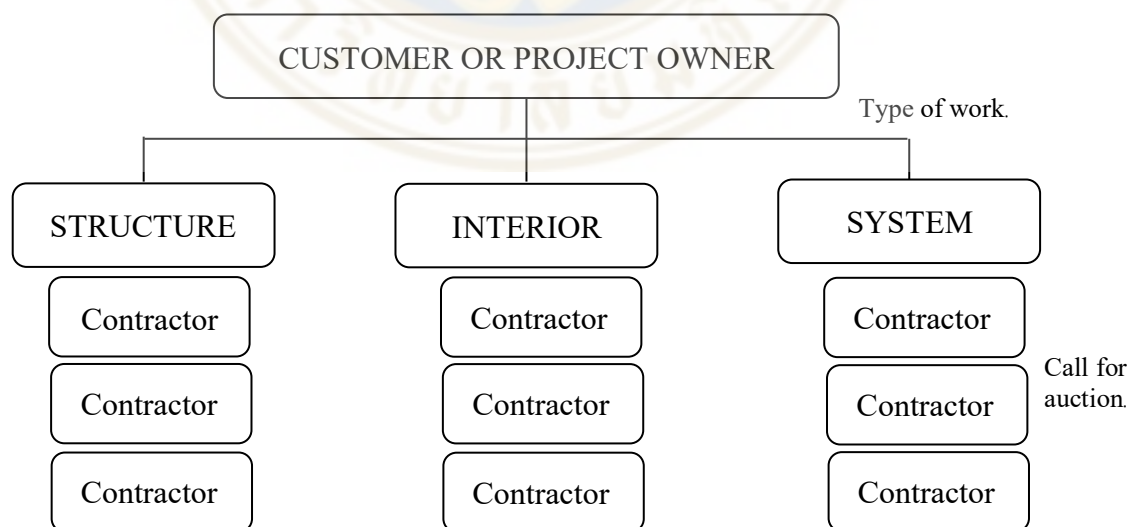


## CHAPTER I

### INTRODUCTION

#### Background of Study

“You have to make sure all the calculation is correct. Our company will make a profit or loss depending on your calculations” This sentence came out from my father, a project manager, who runs a small-medium enterprise of the interior construction business. Our Family business has been operated since 2006 to present. In the middle of 2009, my father had an opportunity to work with well-known public company named as B company (B company is one of the subsidiary companies named C). During that period, B company plans to renovate all of the old stores that provide service for over 5 years to make it modern and trendy following the changes of people’s lifestyle. Two years after that, the project owner of B company rotated to several subsidiary companies and still using service of my company for construction and interior. Therefore, the scale of work for my family business was expanding into full-service of construction including the civil or structure' construction.

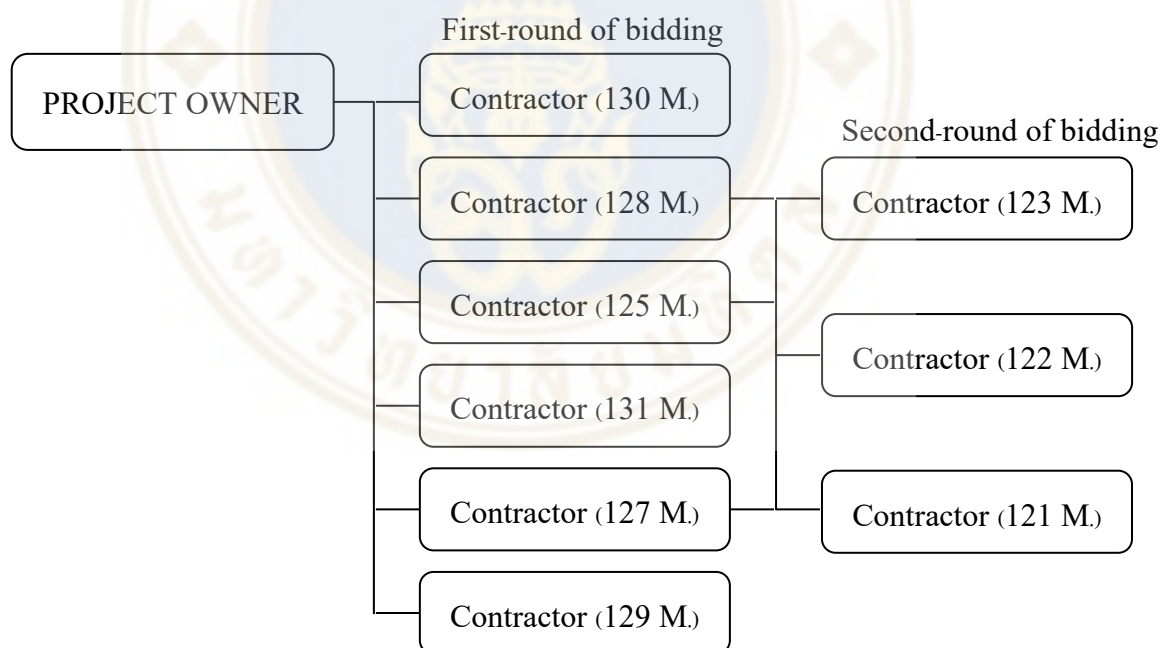


**Figure 1.1 Process of calling for bidding**



In terms of conditions for the construction business to get a new project, the company has to be qualified for the criteria to enter the auction process. The figure 1.1 represents the process of bidding call for each category of work and the figure 1.2 represents the process of bidding based on the price per contract. In the process of bidding, project owner will have a different strategy depends on the project scope. However, most of the project owners will divide the bidding details based on the type of work. Then, the project owner will call for another bidding at different times. Each type of construction will not be started at the same time, it has to cooperate with other contractors to calculate the lead time of work or which area that can be started. Every auction in this company takes two rounds of auction.

The first round is for the contractor to offer the price and the second round is for price negotiations. A week later, the customer will announce an official letter and call the company for preparation of signing the contract including announcement of the date for handover the area to the contractor.



**Figure 1.2 Process of bidding**

In the perspective of opportunities in the economy of Thailand, public construction had been growing up continuingly in past 5 years. Especially in Bangkok, a lot of condominiums are in the process of building and countless number of

condominiums was built. Real estate companies are expanding their market share due to the government's announcement in early 2018 about building BTS and MRT (Public transport train) to cover the needed area of downtown Bangkok and nearby suburbs to improve the quality of life and reduce the lack of transportation. This policy is a great opportunity for all companies in the real estate industry to expand their business.

According to the economic report from The Office of The National Economic and Social Development Council Thailand, the investment in construction has been slightly decreased before it rockets up to the current situation. Since the end of 2018, the growth in the construction section went up to 2.7 percent from the previous year. In Quarter 1/2019, the investment in construction increased by 1.8 percent compared to a 5.1 percent growth in the previous quarter. Then, the investment in the construction industry increased by 0.9 percent in quarter 2/2019, compared to the 1.8 percent growth in the previous quarter. Based on this information, the public construction is slightly increasing in the past few years while the private construction has a significant growth (NESBD, 2019).

As an example case, C company is well-known company as one of the biggest shopping mall companies in Thailand. According to the annual report of the company 2017-2018, the investment in properties has been increased from 84 million to 108 million which can be calculated as 22 percent. The increasing of investment shows that C company had planned to open new shopping malls or expanded their business. Also, C company had it contact to several construction companies and get ready for the new project. The expansion plan of C company was including 50 new sectors within the next 5 years. Thus, opportunities for market expansion are not only the shopping mall business but the real estate industry has grown up expeditious following the expansion of local transportation.

The objective of this case study is to help audiences to understand what are the key factors that cause the delay and loss of work in the construction business. Moreover, the owner of the construction business can be able to prepare themselves to prevent the damage. Also, the company can be capable of designing the risk management plan by using the information inside this research. The author will focus on the existing situation that happened since the project X started. The case study is up-to-date and follows the real situation.

The scope of the case study will focus on project X (the most recent project of the author's family company has operated). Also, the author tries to get information from several people who have been involved in the project directly and indirectly. The author analyzes information by using project management theory as the main theory which included other subsidiary theories.

One of the most important roles of project management is project manager. The project Manager in the construction business is responsible for the overall of delivering the company owner's physical improvement and development within the constraints of cost, schedule, quality, and safety requirements. The project manager role is important not only in operating activities of architectural and engineering construction companies but also as a developer of infrastructure in every country (Edum-Fotwe F.T. and Mccaffer R., 2000). In the small-medium enterprise, the project manager would responsible as an owner also. The most important part of the project managers or the company owner is to analyze and aware of the risks in the future, then, eliminate those risks. This case study will consist of articles from Thailand academic research and foreign academic research together to cover all the key contents, particularly, the factors that drive real estate industry a significant growth in the past few years.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 The Definition of Related Terms**

Loss can definition in a lot of meaning. In accounting or financial, a loss is a decrease in net income that came from outside the normal operations of the business. Losses can count as a result of some activities in business such as sale of an asset for less than its carrying amount, or the loss in some profit but not count as 100 percent of the loss.

Subcontractor is referring to the one who takes a portion of a contract from the principal contractor or from another contractor (The Gale Group, INC., 2008).

Contractor is referring to a person or company that arranges for supplying materials or workers (Cambridge Academic Content Dictionary, 2019).

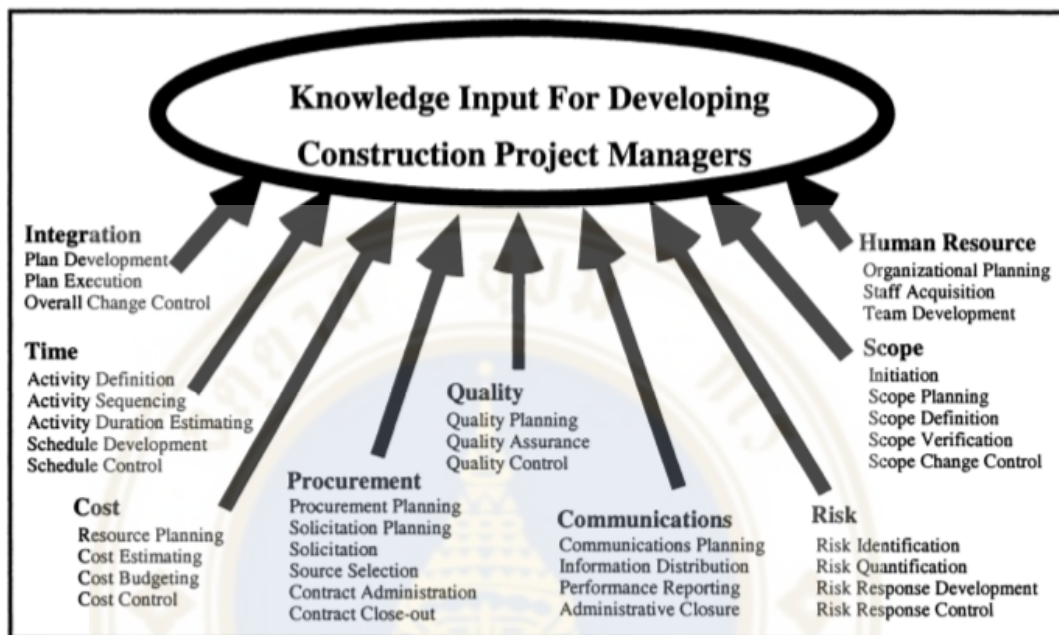
Consulting engineering is referring to a professional service that provides independent expertise in science, engineering, and related areas to developers, governments, and construction companies (Engineeringlegacies, 2019).

Project Owner is referring to the person who has authorization and responsible for project owner. In some companies, project owner is subsidiary under the Department Store Development Division. One project owner can take care of two or three projects depends on the scale of projects and capability of project owner.

#### **2.2 Project Management**

Project Management is the application of several tools and techniques from various resources toward the achievement of one-time task within the cost, time, quality constraints, complexity, unique, planning, monitoring, management of all aspects of each project, and motivation of all factors that are involved in the project in order to achieve the objective of the project (Atkinson R, 1999). The professional competence in project management is achieving by the combination of skills developed through

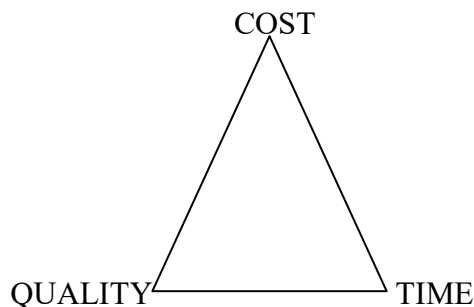
experience and knowledge acquired during training. A lot of knowledge is required to manage a single construction project such as cost management to analyze about financial of the project or critical path analysis in order to analyze the duration of tasks. (F.T. Edum-Fotwe and Ronald Mccaffer, 2000)



**Figure 2.1 Knowledge Input for Developing Construction Project Manager**  
(Edum-Fotwe F.T. and Mccaffer R, 2000)

From the above definition, project management is a significant application to help the business owner monitoring the progress of the project. Normally, the company will hire an expert to be a project manager to control and monitor the project. In this paper, the author focuses on project management, risk management, cost management, and 5M Method. Several pieces of research mentioned about role and potentials of the project manager as the success factor of work who are capable of utilizing the efficacy of project management tools. However, the project manager has to apply the important skills such as tactical planning, strategic planning, finance and accounting, operational planning, cost control management, risk management, personal influencer, etc. in order to lead people in a team and analyze the situation of the project.





**Figure 2.2 Iron Triangle**

The triangle theory for the project management field is a relationship between three important criterias for one project in construction business. Three criteria that most of the research mentioned are cost, time, and quality. Cost in project management is referring to a fixed cost that the company owner and project owner are unwilling to pay more. The project manager should manage the cost within a limited budget which directly affects the profit of the company. The factor of time is the most priority that the company has to be concerned. The reputation and the trust of the company will be relying on finishing the project on time. It is necessary to finish the project within the deadline that the company committed to the customer or project owner. The delay of time factor will directly be related to the cost factor. The last factor is the quality of work, this factor is showing the potential and performance of the company. In project management, all construction companies should be concerned about all those criteria which strongly relate to each factor. Nevertheless, the company can monitor those factors by using project management tools to analyze the delay of work and the issue that causes more money

The Kepner & Tregoe Project Management Model is a that had been found by Kepner C. and Tregoe B. in 1987, the tools are the combination of several management techniques which can be summarized as four-step. The first step of the model is project statement. The project statement is the process of identifying dependency into action, target completion date, and result in order to state purpose and direction of the project in the narrow scope. The second step is to develop objectives refer to the project management by objective. The project manager has to integrate

works effort of the company by cascading objective of the project downward. So, the objectives can be achieved at the lowest level to the highest level consequently. The third step is the work breakdown structure. This step refers to identification of the bottom-up approach of each terminal element by breaking down all subordinate activities. Project manager has to redefines the objectives in terms of accomplishment and deliverables. After redefining breaking down tasks and accomplishment, project manager will be able to calculate cost estimation of the project. Next step is identified resource requirements. In this step, the project manager has to determine necessary resources which related to machines, equipment, facilities, and human. The last step is project monitoring. Project manager has to manage all resources and monitor project to make sure that all activities that breaking down are completed and achieving the objective of the project within the cost estimation. Another tool for project analysis is the critical path analysis. Critical Path is a method that works in parallel with the work breakdown structure as a management control system. This method will come after the project manager identifies all the work breakdown structure to find out the part that will be related together from start till the end of the project.

Another relevant management theory that can separate as one field but also adapt to use under project management theory are risk management and cost management.

### **2.2.1 Risk Management**

A risk factor or event that can be characterized by having consequences should it occur and a likelihood of occurring. Consequence as the outcomes of an event that affects to objectives and likelihood is the chance of something to happen. Project risk management is a core process within the project management process. All those definitions can be assumed that every project management needs risk management for eliminating and controlling the risk that can happen during the project. Therefore, the company can prepare for the second plan in case the company cannot avoid the risk. (Baccarini, D. and Melville, T., 2011)

### **2.2.2 Cost Management**

Cost Management is essential to manufacturing company in order to maintain profitable sales to the company and sustainable position in the current competitive global market. Cost management is including the liquidity of financial of the company. Effective cost management will enhance company competitiveness and survival of its business, especially during the current global economic crisis (Deros B.M., Rahman N., Zainal N.H., Rahman M.N.A., and Ismail A.R., 2012).

## **2.3 Thailand University Journal (Nakwichien T. ,2012)**

The principle of management had several perspectives that different in each country based on concept and the behavior of those countries. In Thailand, there are different perspectives on construction management compared to other countries. Therefore, the author has added one theory concepts from Thailand's academic research to support the information that the author collected from the interviews.

### **2.3.1 Type of delay in construction work**

2.3.1.1 “Non-Excusable Delay” is one type of delay that occurs by the contractor. This delay could possibly occur for several reasons such as lack of workers, accidents, material shortage issue or adding an extra work

2.3.1.2 “Excusable Delay” is a delay that happens from the contractor, customer, or customer' consultant. However, constructor does not have to take responsibility for this kind of delay. The excusable delay can be sampled as the delay from the insecurity within the country or natural disaster.

2.3.1.3 “Compensable Delay” is a delay that can ask for compensation or extend the deadline from the customer such as the delay of hand-over the area to the constructor.

### **2.3.2 5M Method**

5M Method has been widely used in Thailand to analyze the consequences or the impact that occurs in construction work. Most theories divided the factors that cause the delay of work into 5 characteristics.



2.3.2.1 Man or Manpower, most of the work in the construction business has been done by a human. Especially, the volume of the scale of work will define the number of people. The construction site will consist of several levels of labor depend on the ability of work.

- Professional or Project management
- Technician or Foreman
- Skilled Labor
- Labor

The project manager has to take responsibility to calculate the needs of manpower for the scale of work. In case that the project is a big volume, customer will hire a construction' consultant to control and monitoring the contractor. In case that the project is too large, the company may not have enough people to work. The company will hire a subcontractor to take a portion of a contract to work.

2.3.2.2 Money is consisting of cash and credit use to support the work of the construction business. In case that the scale of work is large, the owner of the company might have to invest a large amount of money in the first period before collecting the money of installation from the customer. Construction company needs a lot of short-term asset for the liquidity of the company to be able to purchase the material and hire labors. This factor will directly involve the cost management that mentioned in the previous chapter.

2.3.2.3 The machine is the labor-saving device in construction work. Some construction site may have enough material but lack of potential of work then the machine became useless. However, the shortage issue of machine in construction site could create a difficult work for labors which directly affect the timeline of projects. The project manager has to plan the guideline of using the machine to save cost and control the cost

2.3.2.4 Material is another important factor in the construction business. In case that company lack of material supply, the project can be delayed. The price that had been calculated in the beginning can be lower or higher all the time due to the changes of each type of materials. Some companies cannot store their material because of financial liquidity. The project manager should monitor the left-over material and the economic price.

2.3.2.5 The method, there is a differentiation in construction plan for each project depending on the experience and knowledge of the project manager who drives the project. Most of the construction methods are related together which is difficult to skip one part and start the other parts.



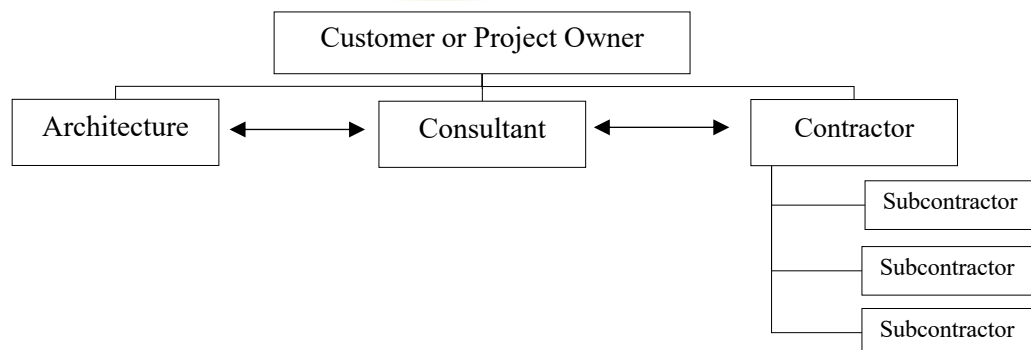
## CHAPTER III

### RESEARCH METHODOLOGY

#### 3.1 Primary Data Collection Method

The objective of this case study is to help audiences understand what are the factors that cause the delay and loss in the construction business by using the qualitative method to observe and interview experienced people in the construction site which considering as a proper methodology to discover insight issues and problems from interviewees. The author analyzes and writes this case study from the perspective of the business side. So, this case study will not go to the in-depth detail of engineering part. Furthermore, this paper has to review with academic journals as a secondary data source to confirm the result of observation and interview.

The author will separate interviewees by their knowledge which is an on-the-job interview. The first group is a support group or workers who are not graduated in the engineering field and currently works for the company. The second group is workers who graduated in the engineering field. Both groups are joining in both parties as the company's workers and project owner's team. The author finds out that people who are not graduated in the engineering field will focus on accounting and financial, machine management, or people management more than people that graduated in the engineering field.



**Figure 3.1** The relationship between people in project

### 3.1.1 Observation

#### On-The-Job-Observation

Location : Project X, 2019 at Pak-Chong district, Nakhon-Ratchasima.

Scale : 12,000 square meters.

Scope of work : Structure and Interior construction

Period of Project : July - November

The observation plan is an on-the-job observation. The author chooses to collect information during the construction project. Project X is a project that building a new factory and retail department store at Pak-Chong district, Nakhon-Ratchasima. The project owner came from C company that was mentioned in the introduction chapter. This project is still in the middle of the construction process. However, since the project started until the date of collecting information the project had been delayed 28 days behind schedule.

#### 3.1.2 Interview (On-The-Job-Interview)

The interview will be focusing on interviewees' perspective and opinion for project management, people management, cost management, machine management, and material management of project X based on their experiences. The author aims to gather all information and opinion in both positive side and negative side in order to analyze an efficient method to manage construction project.

**Table 3.1 Interview List (1)**

People who were not graduated in Engineering field. Company' Employee (Support)				
Name	Position	Interview Date	Time	Year of Experience
Ms. Na	Director & Shareholder	25/09/2019	30 minutes	More than 15 years

**Table 3.1 Interview List (1) (cont.)**

People who were not graduated in Engineering field. Company' Employee (Support)				
Name	Position	Interview Date	Time	Year of Experience
Mr. No	Office support	26/09/2019	10 minutes	4 years
Ms. Y	Accounting & Administration	26/09/2019	25 minutes	15 years

#### 3.1.2.1 People who were not graduated in Engineering field.

##### Employee in the Company (Support)

It is difficult to control labor costs and machine costs within budget. Most of the time, subcontractors cannot finish their job as they had promised. The company had to find new subcontractors in a short period in order to cover that issues. Sometimes, a new subcontractor is more expensive and causing the inaccuracy of the calculation in the first period. However, the company's option is very limited in the meantime because the company has already signed a contract which includes the rental costs for machines, rental cost for workers' property, and contract with another subcontracts. It is difficult to control because of the inefficient management of the company. All three interviewees agree on that because it is their first project on big scale of structure construction. Also, they are agreeing that company may lose profit due to the inefficiency of management.

The difference from inaccurate cost calculation since the bidding process or the changes in project could make the company unnecessary wasting time and money. Over 50 percent of work had been changed from the original shop drawings that the company receives in the beginning period for calculating the price. So, the cost that had been calculated in the beginning will not be accurate comparing to the reality.

**Table 3.2 Interview List (2)**

Educated in Engineering field. Company' Employee				
Name	Position	Interview Date	Time	Year of Experience
Mr. B	Project Manager & Shareholder	25/09/2019	45 minutes	More than 20 years
Mr. H	Office shop drawing	26/09/2019	40 minutes	More than 10 years
Mr. C	Foreman & Site engineer	26/09/2019	15 minutes	More than 7 years

#### 3.1.2.2 People who graduated in Engineering field.

##### Company' Employee

The weather or natural disaster are the factors that a contractor cannot avoid. During the bad weather, as an engineer, we have to figure out how to work under the bad conditions. It is more difficult in the first period of the project because the worker has to work without the roof on the soggy' soil. Under the bad conditions, sometimes the machine cannot work in the heavy wet soil. The company has to rent additional equipment and machine that extremely expensive to support our workers to work. Also, unfinished or Revised of the construction drawing would causes the delay of work because the company has to wait for confirmation from the architecture. Additionally, another factor that cause from delay is company will have to deal with other subcontractors to fulfill the gap. The difference subcontractors come from different teams of labor which is difficult to make all the labor work together as a team.



**Table 3.3 Interview List (3)**

Educated in Engineering field. Work for Project Owner.				
Name	Position	Interview Date	Time	Year of Experience
Mr. M	Engineer' Consultant	27/09/2019	30 minutes	More than 10 years

#### 3.1.2.3 People who graduated in Engineering field.

Work for Project Owner.

The key factor of business is operation management. The result of the work represents the efficiency of the company. In this construction site, the company does not have enough skilled labor and operation plan.

**Table 3.4 Interview List (4)**

Educated in Engineering field. Customer perspective view.				
Name	Position	Interview Date	Time	Year of Experience
Mr. K	Project Owner	26/09/2019	40 minutes	More than 20 years

#### 3.1.2.4 People who graduated in Engineering field.

Customer perspective view.

Financial is important to operate the construction business. The liquidity of financial has to come from the project owner and the construction company. The liquidity of the company finances will show out through the result of work. A lot of construction companies decide to reduce their cost by using low-quality materials which affect the reputation of the company and the project owner. As a project owner of C company, the main responsibility is making sure that each project will be finished on-time. A lot of times that it is an excusable delay because of the unclear or unfinished

construction drawing. Also, the C company will plan each project to have a 5 percent reserve cost in case that the actual work is over the details of bidding.

### **3.2 Secondary Data Source**

In 2012, Mr. That Nakeichien graduated with a master's degree from Rajamangala University of Technology Thanyaburi in Civil Engineering program published the research paper of "Factors Affecting Delays in the Road Construction Projects Local Administration Authorities in Bangkok Vicinity". The research had been discussed about factors that cause the delays of work in road construction. Also, Mr. That decided to collect the information and data from the private constructor and public constructor to complete his research.

In 2000, F.T. Edum-Fotwe and Ronald Mccaffer published the journal name "Developing project management competency: Perspective from the construction industry". The journal discussed the proper skills of Project Managers in construction perspective.

In 1999, Roger Atkinson published the journal name "Project Management: Cost, Time, and Quality, two best guesses and a phenomenon, it's time to accept other success criteria". The journal discussed the definition of Project management by using the iron triangle as a measurement of success.

The author chooses those articles and Journals as a reference to analyze the case study based on management theories.



## **CHAPTER IV**

### **FINDINGS ANALYSIS**

After the interview and observation session, there are several interesting factors that have to be discussed, analyzed, and categorized to select the key factors that significantly impact on the delay of work and loss. Based on the interviewees' opinion, the main factors that should be concerned in this project are weather, unfinished or revised construction drawings, unskilled labor, the potential of the company, lack of communication between people, and financial liquidity. So, the author decided to combine some similar factors and key factors, then, analyze information based on the project management theories. According to the list of key factors that had been gathered from interviewees, all the factors can be categorized as the external factor and internal factor.

The external factor is the important factors that affect the delay and loss of work. This type of factor is the factor that companies cannot avoid. So, the company has to list all external factors that possibly happen during the project to prepare themselves. Some factors are unpredictable such as a natural disaster or political unrest which happen without notice. Moreover, some factors can be predicted such as bad weather, supply shortage, or the delay of logistic materials. The company has to plan for a risk management to deal with every situation to make sure that all the work can be operated and completed on time.

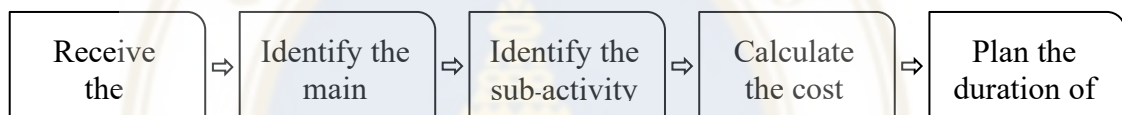
The internal factor is the factor that the company can handle and prevent it from happening which mostly appear after the construction started. The internal factor is the factor that occur internally in the company such as management, labor skills, financial liquidity, and communication. According to the information and analysis of this project, internal factor is the biggest concern point for this company. Most of the interviewee agrees that the biggest issue of this project is lacking of knowledge for this type of Construction. In other words, there are several management issues such as unskilled labor with the type of work, the broken promise from a subcontractor, uncondusive of the area, or bad management with the inside company.

### Key Takeaway:

- Potential of project manager
- Cost management (financial liquidity)

## 4.1 Potential of Project Manager (Project Management and 5M Method (Man, Materials, Machine, and Management))

As a project manager, they have to sort out the plan of all subordinate activities in the project, known as work breakdown method. The project manager has to be capable of identifying the main activities of the project, identify the duration or timeline, sub-activity, budget, or critical path to monitor the project in every activity.



**Figure 4.1** The process of identify dependency

In the construction project, the most important action as a project manager is to understand the overall project. Figure 6 represents the activity of identifying dependency in the project from the beginning until the project get started. In the process of receiving the construction drawings, the customer will provide the Bill of Quantities (BOQ) to the contractor. So, all the contractors will calculate the price with the same standard. After identifying dependency, the project manager will put each activity and schedule into the critical part and work breakdown structure. Identifying dependency will help the project manager to accumulate tasks and see the connection between tasks and the timeline.

Identification of the dependency, critical part, and work breakdown structure are tools that will help the project manager to set-up strategy within the project. In the construction industry, there are patterns of work that is necessary to follow. Some task can start without waiting, some task has to wait for another task to get started, and some work can pre-work 50-80 percent of work and finished later. It is a responsibility of a project manager to monitor the quality and quantity of work piece. However, some

delays in individual work could affect other work which directly affect the critical path. In the construction industry, the project manager should be graduated in engineering or architecture field because several works need specific knowledge from the expert who can solve the issue or understand. The critical path and work breakdown structure are useful methods to help the project manager to have a clear vision of the overall project. It would assist to calculate the need for manpower, materials, cost, and machines within a project. After the process of identifying dependency and activities of the project.

In Project X, the lack of potential of the project manager is a cause of the lacking workers issue during two months of work. The project manager cannot estimate the needed manpower, so, the company faced the manpower' shortage in the first month. During the second month of constructing, the project manager hires a lot of people to push the work back to schedule but it turns out that the company surplus with the needed labor because of the area of work does not allow people to work.

In terms of materials, the company faced an issue about the schedule of materials delivery and a shortage of materials issue in project X. In this scale of the construction site, the company has ordered a huge amount of materials. Some materials are very important, the shortage of materials only one day could delay the work for two days due to the waiting time. For example, steel bar needs at least three days of placing the order. The readymade floor needs one month in advance to order. In project X, the company faces the issue of the schedule of the delivery readymade floor. The company has ordered in advance but the date of delivery still based on the old schedule. Hence, the area of work that need to install the floor cannot be installed, over 10 tipper truck has to wait outside the construction site and the company has to pay for the delay in placing the materials.

**Table 4.1 List of the cost of Vehicle**

Type of Machine	Price : Month	Over-times : hour
Tipper Truck (6 wheels)	40,000.-	180.-
Tipper Truck (10 wheels)	60,000.-	250.-

**Table 4.1 List of the cost of Vehicle (cont.)**

Type of Machine	Price : Month	Over-times : hour
Rough Terrain Crane	90,000.-	375.-
Hydraulic Truck Crane (250 Ton)	120,000.- (Per day)	6,000.-

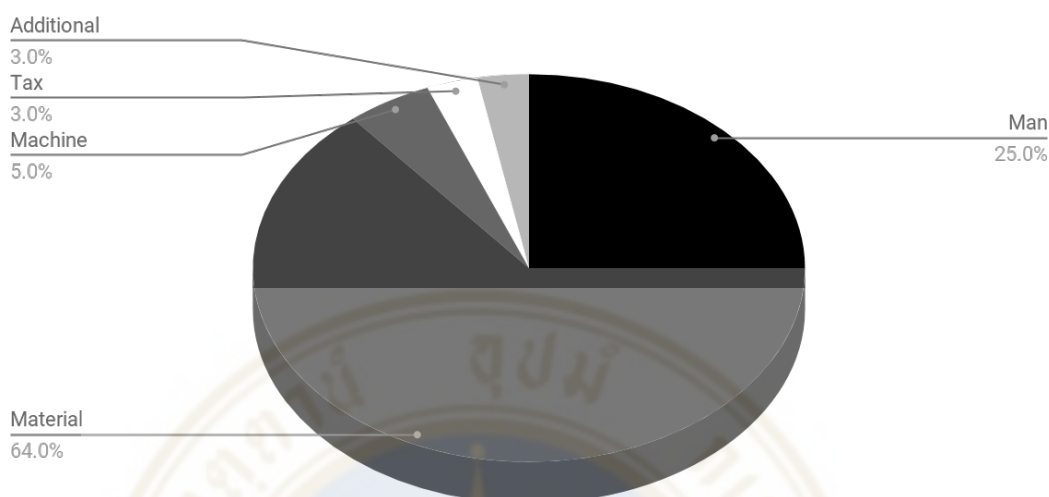
According to the table above, the project manager has to manage traffic inside the site carefully. Otherwise, the project owner has to rent more machines which directly impact the cost. In the case of under-estimate, the number of machines which cost overtime for the company. According to the interview, Ms.Y mentioned about bad management in machine during the project. In the first month, the company was struggling to manage the traffic inside the construction site. Therefore, the company has to pay overtime for more than 3 hours per day for every machine that the company renting.

The project manager cannot estimate the number of needed machines in the construction site. In the first month, the company had enough machines but the subcontractor takes the machine to work only their own work. The company rent only one unit of machine because it can be rotated but most of the subcontractors does not have a plan in advance and project manager did not manage the subcontractor. Consequently, the company has to rent more machines which is not necessary.

A good management will help the company to identify the needs of the company by using project management as a tool. According to this type of business, the limitations of the budget are inflexible. The bad management or plan of the project manager did not create just a loss in profit but it counts as a loss in the overuse of material.

## 4.2 Cost Management (Financial Liquidity)

Approximately cost in construction industry.



**Figure 4.2** The approximately cost in one project

Cost Management (Janthra S., 2013) and Money in 5M' Method (Nakwichien T., 2012), is a theories and methods of money management in a project. According to figure 4.1, the chart represents approximately cost in the construction project. In this project, the company chooses to hire subcontracts for labor only and the company will bear on the materials cost. The profit or loss of the company will depend on how the project manager managing the cost. If the project manager does not monitor the project efficiently, the workers may over-produce the product which causes an unnecessary cost to the company. The cost management in the construction industry is very important because of the limitation of the budget from an auction. One of the most important factors to manage cost of project in terms of materials is the scale and quantity. Therefore, project manager needs to calculate the amount of materials at the beginning of the project and order materials in a huge amount to reach economies of scale. In other words, the accuracy of material calculation is very important for the project in order to gain more bargaining power and have the lowest price which could save around 500,000 - 1,000,000 baht per project.



According to figure 4.1, the estimation for material cost in one project is around 64 percent and man or labor cost is around 25 percent of the total cost. This fixed cost was calculated since the beginning of the bidding process. However, there would be a gap between the actual material cost and the estimation cost for material cost due to the company has to pre-order the raw material to store in advance to make sure that all materials and equipment will be prepared for tasks. However, the company has to have process of tracking raw material to prevent the surplus and the shortage of materials. The process of material tracking could be difficult for a small company because all the materials are receiving and storing in the construction site which can be taken from workers any time in case that they had mistaken on construction work. Furthermore, the most important part of cost management is the financial liquidity of the company. Every company has to have a reserved cash to continue the work of the company. The payment period in this industry will be around 30 - 45 days after the billing period.

Risk Management is one of the most important theories in every business. The risk management will help the project manager prevent issues that will occur in the future. The risk in construction business could be separated into several types. For example, the risk that happens from delay, out of stock from the supplier, or unsafe protection from the worker. Based on the interview, a lot of interviewees mentioned the unstabilizing of construction drawing from architecture. This factor counted as a risk that should monitor closely and notice in advance because it happens frequently.

All the factors mentioned are the cause for the delay and loss in the construction business. It could start with ineffective management through the conflict between people inside the construction site which possibly impacts the delay or loss. In this case, the loss that happened during the project does affect the financial of the company directly. Company had lost some part of the profit that the company should have earned due to the inefficiency of project planning and project monitoring.

## **CHAPTER V**

### **CONCLUSION**

#### **5.1 Conclusion**

The study of this research paper is to understand the factors that cause delays and loss in the construction project. The author wants audiences to understand more about the nature of construction work and hope that this research will be useful for people who are in the construction industry. The author has conducted qualitative research by using depth-interview and observation in a construction site.

Author found out that skillful of project manager, communication, potential of workers, and liquidity of financial in the company are important factors that affect the potential of work in the construction industry. Project manager is the representative of the company that shows the ability of people inside an organization. Construction project needs an efficient management to help a company to operate the business. The Project manager will need tools to help her or him monitoring and tracking work progress of the project. In SME Construction Company, most companies are making a mistake by having the project manager and the shareholder as the same person which could make a lack of management within an organization and cause the inefficient work.

However, the unskillful project manager can possibly lead a company to all issues that was mentioned in the previous chapter. So, the project manager is an important person who will drive the project to success. In this case, project X is the first project for this company in structure construction which means that the company had low potential in this construction type of work. The company should hire an outsource project manager to manage the project, but the company decided to take a risk and try to manage everything by themselves. That decision put the company in a bad situation because the company assigned project management task to a site manager (Mr.C) who does not familiar with project management tools. Consequently, the project had several issues that impact the management process of a company and causing delays and loss inside the company.

The lack of ability to monitor project schedule because the project manager does not know which part of construction should be started first and follow by which task. The project manager does not have a clear work breakdown structure for this project to identify the scope of work. These factors would lead the company to several issues as company could not plan the timeline to order the raw materials. Also, these factors would impact to machine management at the same time due to the project manager is lacking knowledge and traffic management inside the construction site. Plus, the project manager is not graduated from the construction engineering field.

All those mentioned factors impacted on cost management of the company because the company had to rush the materials supplier for the materials supplying. In other words, the company had to pay an extra charge for logistics cost and the overtime for the machine that has to bear on because lack of management issue. According to the interview, the company is 28 days behind schedule, 200,000 baht as an extra payment for overtime use of the machine, 50,000 baht as an extra payment for rushing the order of supply, and 700,000 THB as an extra payment to hire more white collar worker to support and drive the construction work. However, the company can avoid these costs in case that project manager has a knowledge of utilizing the project management tool, capable to track the process of work, and monitor the progress of the project. All these factors will be related to figure 3 which refer to the required knowledge input for operating the construction as Integration, Time, Cost Procurement, Quality, Communication, Risk, and Human Resource. Nevertheless, the project manager does not need to understand every detail in all those criterias but should be capable to see an overall picture and understand project structure well.

Inefficiency of communication and poor relationship between worker and subcontractor in the construction site is another criterion that causing delays and loss for a construction business. Most of the outsourcing employees do not have an experience of working together with another companys' employee or another outsource company. This factor can possibly create a lot of issues inside the construction site, as an example, there was one time that two groups of the worker had a fight at the construction camp after work. The next morning, one group came to work but the other group does not show up and resign from the project. This issue delays the project and



impact to the actual work because the company would have shortage workers issue from leaving without notice.

The lack of skilled workers happens regularly because the company hire subcontract without interviewing personally with the workers. The company cannot know the true ability of subcontractor until they started their work. Sometimes, the subcontract company committed that they are capable of working while the fact is, they cannot do it. This is another criterion that difficult to see. So, the project manager has to manage all the risks that can happen in order to prepare and avoid issues. In case that the company is not good in management, it will cause more than a cost in terms of financial, but it could cause a bad reputation for the company. Most of the construction companies survive nowadays because they could keep their reputation by finishing projects on time with high quality and standard.

In the perspective of customer (C company), the customer does not want to open a shop behind schedule because the customer already planned for the delivery of products and another project of construction that they want to launch out within one year. In case that one shop is behind schedule, the other shop could be delay also. This means the customer will lose opportunities to make a profit for several months.

As conclusions, the success of projects can be considered in 3 perspective as listed as cost, quality, and time. It is very important for companies to manage cost and complete the projects on time with high standard of quality. In order to complete construction project efficiently, there are 5 factors that should be managed and monitored closely as men, materials, machines, and management. Therefore, Project manager should understand projects detail and use project management tools to plan, manage, identify risk, prepare and avoid issues, and monitor all 5 factors to make sure that the projects is following the plan and successful in perspective of cost quality, and time.

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## Appendix A: Interview Question

The author will ask interviewees to focus on two main questions. Additional questions will be asked to confirm information, opinion, and clarity.

- Background of interviewees.
- Position of interviewees.
- Experience of interviewees.
- What are the factors that cause the delay of work in the construction industry? (Can answer from the previous experiences.)
  - What are the factors that cause loss of profit in the construction industry? (Can answer from the previous experiences.)
  - The loss that happens is really a loss or it is acceptable.

