

# **Cooperative Education Report**

The Business World of Contracting and Sub-Contracting: Evidence from a Thai Industrial Corporation

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#### Abstract

This internship is conducted at Siam Industrial Corporation Limited, which is leading sales and services firms for material handling and heavy machinery businesses. Siam Industrial Corporation was founded in 1973 as an industrial corporation with business line of trading machinery and industrial products with high quality of service in installation and maintenance of the equipment. Since then, it has been expanding its business area. The main objective of this study is to learn how contracting and sub-contracting works in an industrial corporation.

This report gives an overview of my three months internship which includes the activities and experiences that I gained. During my tenure at SIC, I worked in EPC department under a project manager and a QC/QA manager. I also assisted them in ongoing projects. Reflecting on my experience at SIC, the internship program has made immeasurable impacts in my aptitude in varied fields such as time management, adaptation, organizational and intercultural competence, project management, communication and networking skill. It has been a wonderful experience in SIC.

Keywords: Contracting, Subcontracting, Project Management

# Acknowledgement

I would like to thank Siam University for providing me with such an opportunity to work in real world business as an intern. I am grateful that I got this chance to enhance my theoretical knowledge with the help of many professionals and experts who have been in the industry for more than a decade. This project has been successfully completed with satisfaction and memorable experiences.

It was a nice experience working in Siam Industrial Corporation. I would like to appreciate all the members and colleagues of SIC, especially my supervisors Mr. Sanjaya Dhoj Thapa and Mr. Gaurav Singh Hamal, for making my stay a memorable, motivational, knowledgeable and fun.

I would also like to express my sincere gratitude to Dr. Tanakorn Limsarun for supervising me with this report. I would also like to thank Dr. Maruj Limpawattana, Mrs. Yhing Sawheny and Mr. Chanatip Suksai for helping me find this opportunity to be a part of Siam Industrial Corporation for three months.

And lastly, I dedicate my sincere thanks to all my friends and families who helped and supported me throughout this period.

Rajat Manandhar

# Contents

Acknov	vledgement	II
Abstrac	t	III
List of l	Figures	IV
List of A	Abbreviation	VI
Chapter	1: Introduction	1
1.1	Company Profile	1
1.2	Organizational Structure	
1.3	Objectives of the study	
1.4	Statement of the report	
1.5	Expected outcomes	6
1.6	Limitation of the study	7
Chapter	2: Literature Review	8
2.1	Related theories	
Chapter	: 3: Methodology	12
3.1 R	oles and responsibilities assigned by company	12
Chapter	4: Results and Discussion	15
4.1	Contributions of student made during the internship	15
4.2	Details of related learning process and new knowledge received	15
Chapter	5: Conclusions	
5.1	Self-assessment as future professional	19
5.2	Comparison of practical learning VS theory	20

# **List of Figures**

Figure 1: MRP Factory Layout	.3
Figure 2: Axial fan for power plant TLT Turbo GMBH	
Figure 3: Fresh Air filters for power plants Donaldson Filters Co. Ltd	.4
Figure 4: Organizational Structure	.5



## **List of Abbreviation**

SICORP: Siam Industrial Corporation Limited

SIC: Siam Industrial Corporation Limited

ISO: International Organization for Standardization

EPC: Engineering Procurement and Construction

VT: Visual Testing

APM: Association of Project managers

PID: Project Initiation Document

QA: Quality Assurance

QC: Quality Control

## **Chapter 1: Introduction**

I have completed my internship in EPC unit of Siam Industrial Corporation located at MRP facilities, Chonburi Province. This Co-operative education is part of my final year bachelor's degree in business administration, Siam University, Bangkok. During this tenure, I worked under a project management team of a completely mechanical engineering background. My main motivation for applying for this internship was to gain some completely new experience in a field of business. This internship gave me the opportunity to learn more about how an industrial corporation actually works, how parts and equipment are made, etc.

## 1.1 Company Profile

Siam Industrial Corporation, founded in 1973, is an industrial corporation with business line of trading machinery and industrial products with high quality of service in both installation and maintenance of the equipment. It was founded as a subsidiary of Sino-Thai Engineering and Construction Plc (Sino-Thai) with the name "Sino-Thai Corporation Ltd." with an initial registered capital of one million baht. The company was a sales distribution channel and an installation service provider of high quality construction equipment of KATO overhead cranes and TCM forklifts. (About Siam Industrial, 2018)

In 1982, they increased the registered capital to five million baht. In 1985, the company restructured as an independent business as it grew continually with the name changed to Siam Industrial Corp. Ltd. (SICORP) with Mr. Krishna Sivakriskul as President of the company. (About Siam Industrial, 2018)

Likewise, in 1986, the company increased its registered capital to 10 million baht and established the company subsidiary namely Siam Industrial Installation and Service Co., Ltd. to serve the demand of professional services which was rising rapidly. (About Siam Industrial, 2018)

As the expansion of business continues, the company has increased registered capital to 20 million baht in 1991. Today, with registered capital of 60 million baht, SICORP's mission is to become one of the leading sales and services firms of material handling and heavy machinery business. It's product lines have therefore expanded into:

- a) Hoist
- b) Cranes
- c) Elevator
- d) Automatic Car Parking

In order to provide professional services to all the customers, the company continuously maintains its expertise on full range of products. In order to gain international recognition and international quality equivalency, SICORP implemented the ISO 9001 Quality standard Management System in all its operation. The company was later awarded with the prestigious ISO 9001:2008 certification on May 24, 2001 presented by AJA Registrars as an importer and sole distributor of various types of equipment and provision of installation, after sales service and maintenance. It was all possible because of the combination of strong determination and dedication by all management and staffs. (About Siam Industrial, 2018)

The company later added another line of business; EPC contractor which stands for Engineering, Procurement and Construction. This unit does all the activities that involves general contracting for engineering, steel fabrication and erection installation of industrial equipment and machinery. (About Siam Industrial, 2018)

The SIC-EPC facilities are located in a company called MRP Engineering Co. in Chonburi province, near Bangsean city. The facility at MRP consists of the following:

a) A fabrication with an area of 10,000 sqm (four halls of 120 x 20 x 12 m, each with four overhead cranes of capacity of 20 tons).

- b) A blasting and painting building of 1,800 sqm provided with a closed grit blasting chamber and two cranes of 20 tons capacity.
- c) A light machining shop of 2,025 sqm.
- d) A heavy machining shop of 10,800 sqm.

# Total area 320,000 Sq.m (200 Rai)

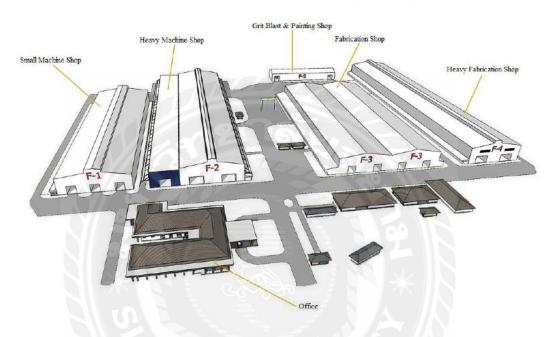


Figure 1: MRP Factory Layout

Works related to fabrication and erection works are done as per the following scheme:

- a) Engineering, process, conceptual, detailed and shop drawings
- b) Project Management & Coordination
- c) Fabrication work including preparation works, assembling, welding, surface preparation and painting
- d) Procurement of raw material for fabrication
- e) Testing requirements (welding, painting, trial)
- f) Packing and delivery to the port or to any job site
- g) Quality assurance and quality control procedures
- h) Site work including unloading, storage, erection & installation work
- i) Site Management, coordination & supervision.

# Some of the projects of EPC are:

a) TLT - Turbo GMBH: Axial fan for power plant



Figure 2: Axial fan for power plant TLT Turbo GMBH

- b) GOWA GMBH: Sound Attenuation System
- c) Bangkok Airway: ULD Storage
- d) Thai Airways: Catering
- e) Ministry of Hydro-power: Myanmar project
- f) Double A: Quicklime plant and PCC Production Plant
- g) Donaldson Filters Co. Ltd.: Fresh Air filters for power plants



Figure 3: Fresh Air filters for power plants Donaldson Filters Co. Ltd.

# 1.2 Organizational Structure

The organizational structure of EPC department of Siam Industrial Corporation Limited is shown in the diagram below:

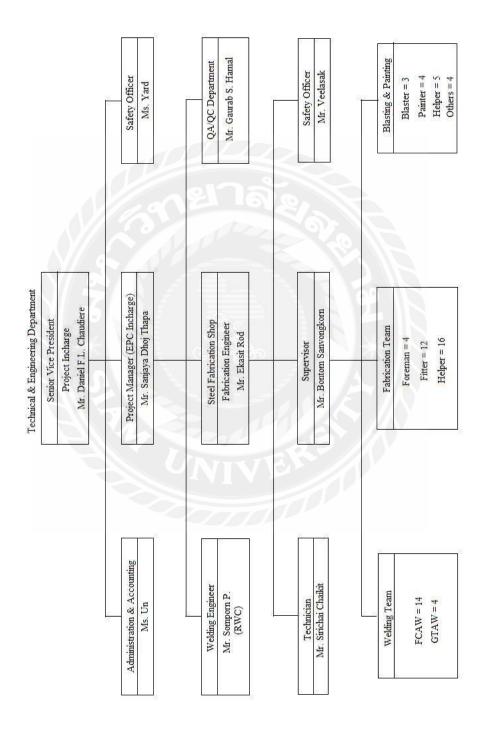


Figure 4: Organizational Structure

#### 1.3 Objectives of the study

The primary objective of this study is to use my theoretical knowledge in real world with the help of professionals and experts. Some other objectives of this study are:

- a) To know how an industrial corporation operates.
- b) To learn how contracting and sub-contracting works in an industrial corporation.
- c) To know about the process of project management in an industrial corporation.
- d) To learn and coordinate through each phase of a project for smooth implementation.
- e) To have working knowledge of project scheduling and basic cost evaluation.
- f) To be familiar with the corporate culture.

## 1.4 Statement of the report

With the objective of learning about the operation of an industrial corporation, the report shows how an industrial corporation uses contractors and subcontractors in its daily operation. The report also focuses on project management of various projects that SICORP gets time and again and how it thrives to complete each and every one of them effectively and efficiently. And finally, the report shows how I as an intern did my job and learned during my 3 months stay at SIC.

#### 1.5 Expected outcomes

The expected outcomes from my internship are:

- a) Understand the procedures and work flow in industrial corporation.
- b) Develop and refine my skills and professional capacity
- c) Demonstrate an understanding of professional and ethical practice
- d) Demonstrate the ability in documentation procedure of the company.
- e) Understand project scheduling and cost evaluation.

## 1.6 Limitation of the study

During my tenure at SICORP, I faced few problems due to which I could not make the most out of my stay. Some of the limitations of the study are listed below:

- a) Since SICORP is a core mechanical engineering company, my area of expertise could not be fully utilized.
- b) Due to lack of mechanical knowledge, I had difficulty understanding the process going on.
- c) During the peak hours of running projects, my supervisors were very busy but I couldn't help due to not being from an engineering background.
- d) Since my internship was only for 3 months, I couldn't learn every process of project management.
- e) Due to language barrier, there were lots of hindrances while communicating with other colleagues.

# **Chapter 2: Literature Review**

The review of literature shows the epigrammatic description on the theories related to project management, contracting and subcontracting, project scheduling, cost evaluation and corporate culture.

#### 2.1 Related theories

The following theories have evolved from different literatures. They are described below:

#### 2.1.1 Project management

Project management is a disciplined technique to initiate, plan, execute and control a team of people to capture a specific goal or set of goals. Project management helps to conduct any activity using various kinds of tools, skill sets, knowledge to converge the requirements of the projects (Martin, 2016).

In the APM (Association of Project managers) process, a project management starts with signing in the PID (Project Initiation Document) where the company invites everybody to a meeting and an agreement is made. In the PID, the managers need to define the quality, time and cost of the project. The most important driver known as the key driver of the project is identified in this process. The second step of the project management is to plan and list the tasks. It makes sure the managers don't miss any task during the project. This step may include the team to have meeting and brainstorm to get a random list and get the list structured into work breakdown structure. Once the list is prepared the estimation is required relative to time and cost of the project.

A network of works to be done is made so that after completion one step another step won't be missed. The network diagram shows how to complete a project in the given time. A Gantt chart is made after the network diagram is prepared. It is the expected output of the project. A Gantt chart helps to communicate the ongoing procedures among people, plan the resources and monitor the progress of the project. (Croft, 2013)

#### 2.1.2 Contracting and Subcontracting

Subcontracting is very popular in industrial world which plays an important role. There are different types of firms, some are big and some are small or medium sized. The large firms subcontract their work to smaller firms and medium sized firms to grab the advantage of lower wages of small firms. (Kongmanila & Takahashi, 2009)

There are various reasons why the enterprises decide to subcontract their work. Like not having enough manpower or resources, subcontracting being a cheaper option rather than hiring some permanent employee and provide them salaries and benefits and some other reasons relating to geographical regions with growth prospects. Firms may subcontract to other subcontractor to deal with technical failures. (EIM Business & Policy Research, 2009)

A company can use many subcontractors for a single project. Having many subcontractors can be a risk to contractors as well as clients because it can be a challenge to manage a group of contractors. A project will be a success based on the ability of contractor to choose the best subcontractor available. Subcontractors are one of the hottest topics of discussion in construction industry because of its uses in almost every project. A success of an industrial corporation depends on the project manager and who he chooses the subcontractor for the job. If the needed attention is not given to selection of a subcontractor, it may cause a serious problem in the operation of the contractor's company. So, it is very important choose the subcontractors wisely. (Yoke-Lian, Hassim, Muniandy, & Teik-Hua, 2012)

As explained above, subcontractors are used extensively in construction industry. The contractors are responsible for the project and its delivery. They subcontract the project to different subcontractors or special trade contractors. The subcontractor will take on their specific responsibilities for the completion of the project. (Mäkiperä & Matias, 2010)

#### 2.1.3 Project Scheduling

Project scheduling is basically how a project's timeline is created and how the project manager sets the deadline with respect to its cost. There may be various problems related to it while scheduling different project activities because of limited resource. It has been one of the research topics since the late fifties. (Herroelen, 2005)

It is very critical to meet the project deadlines as per the schedule of the project. And it's not easy to do so for project managers. There are many challenges that he/she needs to tackle to meet the project deadlines. In this research, the authors have described the four different types of project schedule constraints and how different methodologies of project management work with these constraints. They found out that many solutions of the theory can be applied to real world application when They compared the theory to practice. (Kloppenborg & Lavigne, 2008)

#### 2.1.4 Cost Evaluation

In project management, we have to take various things into considerations like cost control, quality control and progress control. These three controls are the main things that we need to keep track of in order to keep the project running as per the budget. If the project exceeds the budget, it might hamper the upcoming projects as well. It is very important to study the total project cost; and analyze and control the phases of project management. (Zhu, Zhang, & Wang, 2011)

#### 2.1.5 Corporate Culture

Different organizational behavior and theory suggest that the specific cultures found in corporate world varies on the vast array of publications. The term organizational culture can be found everywhere and it has given rise to ambiguity in terms of assessing its effectiveness in an organization. The concept of corporate culture suggests that the climate and practices developes around the handling of people by organization. The knowledge of organizational

culture and types helps understand the reason behind the impact within and between organizations because of managerial reforms. (O'Donnell & Boyle, 2008)



# **Chapter 3: Methodology**

#### 3.1 Roles and responsibilities assigned by company

We all know that the office hour of most of the companies in the world is 9-5 or 10-5 or basically 8 hours of not flexible work per day. However, working at SIC was nothing like that. We did not have any rigid work schedule. We hit the road at around 7-7.30 in the morning and worked till the objective for the day was completed. Sometimes, we get done for the day by 1 or 2 in the noon and sometime we work till 7 in the evening. Moreover, in this technological modern age, our work was not limited to the compound of our office. We also worked from our apartment itself. The roles and responsibilities assigned by the company are listed below:

a) Find out local as well as international suppliers for different products and ask for quotations.

As SIC is an industrial corporation, it needs lots of equipment and materials. There are lots of suppliers of such products both inside and outside of country. One of my job was to search for such suppliers online, visit their websites and contact them through email or phone. Basically, the first option is to search for local suppliers. And if there are no any local supplier, we go for international suppliers mainly Chinese or Indian and some others.

b) Compare quotations from different company and discuss with supervisor to choose the best one.

After I find the suppliers for the desired product, I contact them for quotations. Basically, we order them in bulk. Different suppliers offer different discounts. Some also offer discounts based on lead time of delivery date. The price of the product also largely depends on the brand. So, it's not always finding the cheapest product available. We have to take all things into consideration like brand, quality, quantity, etc. Lots of the suppliers provide huge price cut-offs if we order the product in large quantity. But

ordering more than what we actually need is only going to be a waste. So, we have to analyze if the particular product is necessary for the future projects as well.

c) Deal with different suppliers and direct the potential ones to project manager.

According to guideline provided by supervisor, I deal with the suppliers. Many times, I find the supplier or manufacturer of a certain product I'm looking for. But they may be too expensive or the delivery date doesn't work for us. So, if I to come to an agreement with the supplier or manufacturer, I direct the potential ones to the project manager for further steps.

d) Visit sub-contractor's workshop to check the progress of the contracted work.

With the ongoing projects, there involves lots of subcontractors for building different parts and equipment of machinery. Project manager provides all the details and the time period within which they need to finish the job. However, we need to visit the subcontractor's workshop time and again to check the progress of the work done by them. If they are behind the schedule, we need to warn them.

e) Assist project manager during the audit.

In many cases, SIC is subcontractor to other companies. They will visit the facilities to audit the documents, machineries and equipment. I assist in preparing and presenting the documents for the audit.

f) Check the documents during loading and shipment of the products

After the required products are built, they have to be loaded into containers for shipments. This process is called loading. However, we cannot just ship the product. There needs to be proper documentations attached to the product being shipped. I checked and attached the documents during shipment of equipment and machinery parts in the containers as per

the guidance provided by the supervisor. The document includes the container number, product details like weight, dimensions, etc.

#### g) Market Visit

The contracting and subcontracting works differently in different industries. Once the main contractor hires subcontractors for a certain job, the subcontractor is responsible for all the job and things needed. However, it may be different according to the industry or contracting agreement. In case of SIC, there were certain projects where we bought the materials and provided them to our subcontractor. So, in such events, I went to hardware shops with my supervisor to search and buy the required materials.

## h) Other roles and responsibilities

I prepared formats for QA/QC documents and also assisted in other documentation. I assisted project manager during supervisions of fabrication work, assembling, welding, surface preparation and painting in workshops.

The above-mentioned description are the brief outline of the roles and responsibilities that I was assigned.

# **Chapter 4: Results and Discussion**

#### 4.1 Contributions of student made during the internship

Being from a different area of expertise was my drawback which hindered me to contribute and give my full effort during my three months internship. Many times, I had to sit and just watch my supervisors work with those core mechanical stuffs. The equipment and heavy machineries are constructed in factories. Since, we live in this modern world, they are made with the help of machines. So, my supervisor makes the drawings using AutoCAD, a computer-aided design and drafting software application, which is then used in a cutting machine that cuts the material as per the drawing. I could not contribute to any of this core technical part. However, I contributed to the non-technical part as much as I could. Working for three months in an industrial corporation as an intern has given me the opportunity to work in professional environment.

But I did all I could to make my best out of the time that I had in SIC. My main goal for this internship was to learn how a construction organization operates.

Some of the contributions which I made during my internship period are:

- a) Market Research
- b) Quotation Analysis
- c) Choosing the best alternative
- d) Supervision
- e) Assist project manager
- f) Documentation
- g) Market Visit

#### 4.2 Details of related learning process and new knowledge received

Interning in a big corporation may or may not be fruitful. It depends on the company, supervisor, etc. The intern might not be able to learn everything in a company. However, I was able to grab sufficient knowledge from my internship

at SIC. I had expected few outcomes related with my objectives from my internship. I am sure that I was able to achieve all of them.

#### Knowledge about operation of industrial corporation

The SIC facility at MRP Engineering Co. has only four members; a senior Project manager and QA/QC Manager and two interns including me as well. So, if we had any confusions or wanted to know anything about the work or the company, we could just ask our supervisors easily. And even though my job description has a very limited amount of job or responsibility, I got to learn as much as I could from my supervisors. I got the overall knowledge of how an industrial corporation operates.

## Learn about contracting and subcontracting

There were different project running in the company. I got to be a part of few of them and I learned how subcontracting works. Almost every project involved subcontractors. The basic idea is, when we take on a project of a client, we are the main contractor. But many times, we don't have enough resources or manpower or tools to complete a project on our own. Some of the work requires specific machineries and equipment that are expensive and not required on a daily basis. So, the company hires another subcontractor who offers services related to such specific functions. Basically, companies hire subcontractors in order to reduce the total costs of a project and sometimes to mitigate project risks as well. The cost of hiring a subcontractor is relatively less expensive than to hire permanent employees as the contractor doesn't need to pay subcontractor's workers' salary, vehicle, insurance and other benefits.

#### **Knowledge about Project Management**

I was very lucky to work under project manager himself. I got to learn a lot from him by doing as well as observing and also by hearing his experience. Working under a project manager means, I got the chance to know about project management. Basically, he follows five simple steps in managing a project. They are:

- a) Initiating: This is like a beginning of a project. In this step, the project's value and feasibility are measured. If the project is unprofitable and/or unfeasible, then such projects are not selected.
- b) Planning: If the project is selected and gets the green light, the project manager plans the whole project like its time, budget, etc. which will guide the team. The project plan also guides the team in case something goes south or they bump into some obstacles. The project manager makes the best strategy in order to accomplish the objective of the client.
- c) Executing: After the project manager develops a plan, he/she starts executing the plan by carrying out the processes. This step is all about building deliverables to satisfy the client. The project manager allocates the resources and guides the team to successfully execute the planned processes.
- d) Monitoring and controlling: After executing the plan, the team must monitor the progress of the project like whether the project is going as planned or not. If not, the project manager should take measurable steps to fix it by calculating key performance indicators.
- e) Closing: The project manager closes a project when his/her team successfully delivers the finished product to the client and releases the resources to other projects. This step allows the project manager to analyze the project and identify any mistakes and successes for better success of project in future.

It is not necessary that a project should follow these steps in a chronological pattern. These processes might overlap throughout the phases of the project.

Basically, I learned about these processes with the help of my supervisor. However, I could only be part of controlling and monitoring process as other process needs actual employee to work on. Even though I could not be part of all the processes of project management, I'm very satisfied of what I learned through my supervisor.

### Knowledge about project scheduling and basic cost evaluation

Likewise, the project scheduling also come in planning phase of project management. It's about how a project's timeline is created and how the project manager sets the deadline with respect to its cost. When a project is accepted, a timeline is created which includes when each process should be fulfilled. According to the schedule, the project manager notifies the team and the subcontractor about the work. The project manager also supervises the work if it is being done as per the schedule or not.

### Familiarize with corporate culture

This internship provided me a practical learning experience and familiarized me with the corporate culture. I got chance to attend meetings. And I also got the chance to gain new connections by interacting with the professionals during different meetings. I got to meet and interact with different international clients. This helped me to learn how to communicate professionally. Since this internship in an industrial corporation was completely new for me, I got familiar with the processes involved only after few weeks of work.

## **Chapter 5: Conclusions**

In overall, the internship experience that I had in my three months stay at SIC was way better than I expected. I'm very lucky that I got this chance to enhance my theoretical knowledge with the help of professionals and experts of SIC.

It was a nice experience working in Siam Industrial Corporation. All the members and colleagues of SIC were very cooperative. My stay at SIC was a memorable, motivational, knowledgeable and also fun. It was all possible because of my supervisors at SIC. In my three months long internship program, I learned many things about project management and contracting and subcontracting in an industrial corporation.

#### 5.1 Self-assessment as future professional

The experiences, skills and knowledge I have acquired during this internship is definitely going to be very useful for me in my future career. I now have a better understanding of the work that is done in the management team of an industrial corporation. I also believe that this internship is going to be a good work experience too. It has enhanced my time management and analytical skills as well as improved my ability to work in a culturally diverse workplace.

Working in SIC was not only limited to working in a Thai industrial sector. SIC deals with clients from all over the world and contractors and subcontractors from different parts of the world as well. So, working there for three months has actually given me some insights about the business world of contracting and subcontracting. We live in 21st century, full of advanced technology. Business is not only limited to the walls of a city or a nation. If subcontracting a job to a subcontractor who operates its business in a different country, is feasible and profitable, then the deal can be done. There are containers and ships or airplanes that will transport the product to its final destination.

I'm a business student majoring in Finance and banking which has very less in common with contracting and subcontracting especially in a core mechanical engineering industrial corporation. However, this internship is still going to be very helpful in my future career as I aspire to be an entrepreneur. And even though, in future, I may not be in the field of industrial sector or construction sector involving heavy machineries, the knowledge I gained from Siam Industrial Corporation about contracting and subcontracting as well as project management can still be very helpful in other fields as well. The gist behind any field would be the same.

#### 5.2 Comparison of practical learning VS theory

SIC's internship program has offered me a great opportunity to grow and develop. The knowledge and experience I acquired during three months of internship at SIC wouldn't have been possible by learning in class or theory. Being a business administration student, I studied about project management as well as contracting/subcontracting during my classes. I studied the theories and concepts based on them. But the things that I learned during classes and the things I learned in real world were noticeably different. Although the basic concepts and ideas were same.

Theoretical studies are very straightforward without any alternative if things don't go the way it should be. Without this internship, I wouldn't have known how contracting and subcontracting actually works in real. Obviously, I would have basic ideas about it even without this internship but it would not have been totally correct. For example: Hiring a subcontractor has to be done very carefully. If a contractor hires a subcontractor to make parts of a turbine and when the contractor checks his work, he finds that the job has been done very poorly and the client is not going to accept it. The subcontractor will probably defend the quality of his work. However, the contractor will have to find another subcontractor to complete the job again. He will lose time and money.

Subcontractors may not work the way we expect them to work. They may be unprofessional or leave the work anytime. However, the contractor cannot control their behavior or discipline as they are not the employees. The contractor

cannot fire them as it will only cause him more work to hire a new one and it will also be a loss of time. But a subcontractor is going to partially represent the contractor's business.

Subcontractors are also not responsible for the original contract between the contractor and client. For example, if the contractor agrees to finish up some work by a day, and if the subcontractor fails to complete the work in time, the contractor is responsible for the client's job, not the subcontractor. The contractor has to give the reasons for not finishing up the work. So, such knowledge and experience that I got from Siam industrial corporation wouldn't have been possible by attending a class.

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