Higher Efficiency Management of Construction Project for Small Scale Contractor

by

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ABSTRACT

This research will study the efficiency of the project management tools in apply to a small-scale contractor. This research involves case study (field test), where a small project near Kuching City eas used. The project management tools that used in this research are bar chart, arrow diagram and S-curve. This research also studies the way of preparing bar chart, arrow diagram and S-curve. Beside that, this research also introduces the type of contract, bond and insurance that involve in the contract matter.
CHAPTER 1

INTRODUCTION

The construction industry is heterogeneous and enormously complex. There are several major classifications of construction that differ markedly from each other: housing, non-residential building, heavy, highway, utility and industrial. In addition, these construction types are further divided into many specialities such as electrical, concrete, excavation, piping and roofing.

Contractors, who vary widely in size and work type performed, accomplish construction work. Generally companies and individual engaged in the business of construction are commonly referred to as construction contractor because they operate under a contract agreement with the owner. The contractor who is having a contract agreement with the owner, which provides complete construction services, is called main contractors. The contractor that provides specialties construction is called speciality contractor.

Since the special contractor are operating under subcontracts between themselves and the main contractors, the speciality contractors are referred to as subcontractors. Thus, the term's "main contractors" and "subcontractor" are defined by contract arrangement involved, not by the work classification of the contractors themselves.

A small-scale contractor, which mentioned in this thesis, is those in class D and below. Under normal circumstances they would have one project manager, engineer, four to five administrator personals and ten to twenty laborers. It would be interesting to study their management practice and the manner is which they obtain projects.
Those classes of contractors might consist of a family business whereby the father would pass the job to his son. This may not have proper organization and management procedure as discussed in management books. This study will examine and purpose the higher efficiency management tools. In this study, the author also wishes to investigate the practice by small-scale contractors in undertaking construction project.

1.0 PROJECT MANAGEMENT

Project Management is the Domain of transforming planning into action and taking the results of action back to the planning process. Missions and goals cannot be managed -- they must be translated into "do-able" tasks and activities before they can be managed. At the same time, the mission cannot become too distant or projects lose focus and momentum. "Strategic management" occurs when strategic plans and daily tasks are effectively linked. This is accomplished by creating a project management system that constantly orients users to project mission and goals and which serves as an action link that allows for feedback and course-correction to occur over time.

Project management is not about slavishly "following the plan" but of using a strategy or plan as a context for decisions and actions. As a dynamic and feedback driven system, and as the primary accountability and control function across all levels and areas, project management acts through a process of measurement, feedback, and adjustment with everyone subject to the same work discipline. Thus when a plan component is not achieved "as planned," it is both an opportunity for discovery and learning and an opportunity to refine the plan, based on "real world" information. Project management is the systematic discovery and reporting of success and "failure," the opportunity for new design and thus greater precision of effort -- resulting in greater success.
1.1 CLASSIFICATION OF CONTRACTOR

In the construction field there are several categories classes of license, which are used in tendering projects. According to Unit Pendaftaran Kontraktor Negeri “UPK” overall there are 8 classes in the works category. Each class has its financial limit based on the respective values as outlined in Table 1.

Table 1

<table>
<thead>
<tr>
<th>CLASS</th>
<th>FINANCIAL LIMIT (RM)</th>
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<tbody>
<tr>
<td>A</td>
<td>4,000,001 and above</td>
</tr>
<tr>
<td>B</td>
<td>2,000,001 to 8,000,000</td>
</tr>
<tr>
<td>BX</td>
<td>1,000,001 to 4,000,000</td>
</tr>
<tr>
<td>C</td>
<td>750,001 to 2,000,000</td>
</tr>
<tr>
<td>D</td>
<td>150,001 to 750,000</td>
</tr>
<tr>
<td>E</td>
<td>100,001 to 350,000</td>
</tr>
<tr>
<td>EX</td>
<td>50,000 to 150,000</td>
</tr>
<tr>
<td>F</td>
<td>100,000 and below</td>
</tr>
</tbody>
</table>
1.2 PROJECT OBJECTIVE

Overall there is three main objectives in this research:

I. To highlight the current practice of small-scale contractors in tendering construction works. In this part we will discuss the current method that usually use by the contractor in doing their Estimates job and also the management technique use in present days.

II. To compare the working efficiency of contractors with applying proper management methods and the one without applying it. Normally projects involve much time and expense, and close management control of them is required if they are to be completed within the established time and cost limitation. In this part, we will see the important of a good management and how a good management can achieve a better efficiency in terms of construction time and in making profit. A field test will also carry out in this state.

III. To study the type of contract, bond, insurance and also the problem and the solution that may be facing by the contractor during the construction of a project.
1.3 VARIOUS SECTORS OF THE INDUSTRY

There are many personnel involved in a construction activity. Across the board the construction industry basically involves the following sectors.

1.3.1 Owner/Developer Sector

The entire project is initiated from this sector. It could comprise of a local authority, private sectors or even an individual. They assume risk and enjoy the profit or meet the loss.

1.3.2 Consultant Sector

This is the sector that plans and design projects, prepares tender documents, advises on award of contracts, supervise implementation and administrative contracts.

1.3.3 Contractor Sector

This is the sector that physically translates the projects from their blue print stage to reality. The various types of contractors usually involved on construction projects are:

- Main Contractors
- Specialist Contractors/Nominated Sub-Contractors
- Labour Sub-Contractors

1.3.4 Finance Sector

This sector provides credit facilities and financial facilities to various parties in the construction industry:

- Banks
- Finance Companies
- Credit Corporations
- Leasing companies
1.3.5 Approving Sector

This sector represents the government approving authorities for the approval of development order, building plans, supply of infrastructure facilities, etc. to enable the construction and development processes to proceed and complete:

- Land and Survey Department
- DBKU/MBKS
- BOMBA
- Other State and Federal Government agencies.

The above four sectors jointly and separately participate in the overall process of construction and development. The efficiency and productivity of the industry largely depends on how the various sectors can co-operate and understand each other’s need and problems. It can be realized that the physical construction activities can only be possible by the active participation of many sectors, directly or indirectly, including but not limited to the builders and contractors.
CHAPTER 2
INTRODUCTION TO SCHEDULING, CONTRACT, BOND, INSURANCE

2.0 OBJECTIVES

The objectives of this chapter are to examine the reasons for scheduling construction projects that will be used later in this study. This chapter also briefly describes the construction industry and how project scheduling fits into the overall construction process. It considers the nature and content of a construction contract.

2.1 REQUIREMENTS FOR CONSTRUCTION SCHEDULES

2.1.2 Significance of Costs and Time

The cost to complete a construction project and the time that will be required for its completion are almost always of major significance to the parties who are involved. Project costs are closely related to project duration. Costs will increase if the project must be completed in an unusually brief period and will also increase if the construction is drawn out over an unnecessarily long period. The individual or firm that engages a contractor to complete a project is concerned about the actual construction cost and also about the financial cost resulting from having capital tied up in land. Such an individual or firm may find it preferable...
to spend more on construction to have the project completed in shorter time.

A construction schedule is a management tool that enables construction managers to direct the accomplishment of construction projects so as to complete them in a timely and cost-effective manner. Occasionally, a construction manager will balk at using a particular scheduling technique, particularly if it is a new technique; however, few construction managers dispute the need for construction project schedules. The type of schedule that is required for a particular project depends upon the nature of the project. A simple bar chart schedule may be appropriate for a project involving only a few tasks that must be accomplished in some specified sequence; even though the project may have a high dollar cost and may require the exercise of advanced construction skills. A more complicated project, one involving the completion of great many highly interrelated tasks, calls for the use of a sophisticated technique, such as the Critical Path Method (CPM). Use of the sophisticated technique may be appropriate for a complex project, even though the project has a low dollar value. A sophisticated technique may be appropriate simply because the contract documents specify its use.

2.1.3 Sophisticated Versus Simple Scheduling Methods

A construction project can be a very complex operation. There may be dozens of crafts and subcontractors simultaneously working on as many or more different elements of the project. The progress made by one party in this team effort will affect the rate at which other parties can proceed with their work. It may be very difficult for even an experienced
construction manager to take into account all the interrelationships between the tasks. Although a bar chart schedule may be prepared that is based on study of the relationships that exist between the elements of project work, the bar chart will not actually depict these relationships. If it should become necessary to revise the sequence in which tasks are performed, the effects of such a revision may not be apparent. Sophisticated scheduling methods are appropriate for complex projects because sophisticated methods allow the scheduler to depict the relationships between tasks.

2.1.4 Appropriate Level of Detail for a Schedule

The topic of appropriate level of detail is covered in depth in Chapter 2. A schedule should be prepared in sufficient detail to reflect all the significant relationships that exist between the tasks that make up the project, insofar as these relationships are known or can be predicted.

2.1.5 Scheduling and Uncertainty

There is almost always some uncertainty concerning the factors that will actually govern the rate of progress on a project. Weather conditions and labour and materials availability can only be estimated when the schedule is prepared. This uncertainty is an argument for the preparation of a detailed schedule, rather than an argument for proceeding with a sketchy schedule or no schedule. If the construction manager has prepared a detailed schedule, he or she can immediately determine the impact that some unexpected event will have on the project progress and
can take corrective action to minimise such impact. For example, the manager can call for overtime and weekend work to make up for the loss of a week of construction time because of unseasonable heavy rainfall. Although this corrective action may appear obvious, it is not always obvious whether such expediting action is required for all tasks, or just certain tasks.

2.2 ESSENTIAL TERMS

2.2.1 Project

A project is a planned undertaking. The scope of a project may range from very broad to very narrow. An example of a project with a very broad scope would be one involving the repair, upgrading, or replacement of all deteriorated or substandard bridges in the Interstate highway system. Such a project would be conceived at a very high level within the nation's executive or legislative branch. After Congress approved the project and provided the funding for its implementation, the project might possibly be divided into subprojects for execution based on such criteria as geographic region and urgency. A project with an intermediate scope might be one in which a private firm develops a commercial and industrial park. Such development might include market studies to determine the optimum location, size, and nature of the park and its facilities, acquiring the land, arranging for short-term and long-term financing, and designing and constructing the buildings and the utility and road systems. An example of a project with a narrow scope would be a project to alter the interior partitioning of an existing building.
2.2.2 Construction Project

The construction process includes planning, designing, and constructing. For the purposes of this book, a construction project is defined as a project to construct a specific facility or group of facilities, such as a building or a group of buildings, and the related utility and road systems. Although a construction project, as defined, has a narrow scope, such an undertaking can be very complex. The construction of a large office or industrial building may require the co-ordinated efforts of the general contractor and dozens of subcontractors, material fabricators, and vendors.

2.2.3 Construction Project schedule

A construction schedule is a time-phased plan to perform the work that is necessary to complete a construction project. Hereafter, the contractor will be indicated as the person who prepares the construction schedule. The schedule may actually be prepared by a member of the contractor's staff, the scheduler, who will be assisted by other members of the contractor's staff and, sometimes, by scheduling consultants. The schedule is almost always prepared in a graphic format, in a tabular format, or in both formats. The schedule indicates the planned starting and ending dates for each of the work elements that make up the total amount of construction work to be performed.

The modern art of scheduling began with the development of the bar chart, often called a Gantt chart, about 70 years ago. The bar chart was originally applied to industrial management but was soon adopted by the construction industry. It enables the user to depict graphically the planned sequence of project work activities. The bar chart is still widely
used today, either as the primary scheduling tool or as an aid in presenting schedules that have been prepared by using more contemporary techniques.

2.3 PARTICIPANTS IN THE CONSTRUCTION PROCESS

Most of the following parties will be participants in a typical construction project.

2.3.1 The Owner

The owner, also called the client, is the person or organisation that will pay the bills as well as receive the ultimate benefits of the finished project. The owner is responsible for determining what the project will include (also called the scope of the project), when the project can begin and must end (the schedule), and how much he or she can afford to spend (the budget). In most cases the owner relies upon the advice of other people to establish these project parameters. Large companies or institutions that are involved in constructing major facilities have entire divisions set up to handle this process. Facility engineers, facility managers, and planners are a few of the job titles for people who specialise in this sort of work. Small businesses or companies that do not do a lot of construction may rely upon outside consultants to assist them through the process. Project managers, construction managers, and design professionals can provide this service.

Owner organisations can be broken into two major categories, public and private. A public agency exists for the ultimate benefit of the citizenry, the general public. Since the project is paid for from public
funds, statutes exist which describe how the project is to proceed. Examples of public projects would be a town library, an interstate highway, or an army barracks. Statutes require that these projects be publicly advertised with all qualified and responsible bidders given the opportunity to compete. Wage rates and bonding requirements are also commonly stipulated.

**Private** organisations can be described as any individual, partnership, corporation, or institution that builds a project for its own use or for resale. A private organisation has much more freedom as to how it proceeds with a project. Private organisations often invite selected designers and builders to compete for their projects. Examples of private projects would be individual homes, shopping malls, or some hospitals and universities.

In order to achieve success on a project, owners need to define quickly and accurately the project's objective. They need to establish a reasonable and balanced scope, budget, and schedule. They need to select qualified designers, consultants, and contractors to work on their project and they need to put in place an effective control system to stay informed about the project. As will be described throughout the course of this book, the project type, the organisations involved, and contract methods chosen all dictate different levels of owner involvement and control.

### 2.3.2 The Designers

They may be employees of the owner, but are more often the employees of an architect engineer (AE) firm. In addition to designing a facility that meets the expressed needs of the owner and that complies with
applicable building codes, the AE may be retained by the owner to act as his or her representative in inspecting the project work, to review and approve materials that the contractor proposes to use in the work, to review and recommend contractor requests for progress payments, and to perform other functions on behalf of the owner.

2.3.3 The Contractor and Subcontractors

The responsibility for the interpretation of the contract documents and the physical construction of the project rests with the construction contractor. In a traditional arrangement where the owner, design professional, and contractor are separate companies, the contractor would be termed a prime contractor and would be contractually responsible for delivering a completed project in accordance with the contract documents. In most cases the prime contractor divides the work among many specialty contractors called subcontractors. On a large project these subcontractors may also divide up the work into even smaller work packages (see Fig.).

As projects continue to get larger and more technical and as owners seek earlier and more accurate pricing and scheduling, many variations have begun to occur in the contractor's role. Contractors are getting hired earlier in the process and are being asked to provide technical, cost, scheduling, and constructability advice to the owner and the design professional. In this shift into preconstruction involvement, the contractor acts as a construction consultant. Taking this in a Pure Construction Management arrangement the construction professional, owner, and design professional
2.3.4 The Design Build Firm

The term is usually reserved for firms that perform both design and construction functions, but such a firm may also perform planning functions.

2.3.5 Fabricators and Vendors

These terms apply to firms that contract with the owner or with the contractor to fabricate and deliver fabricated or off-the-shelf construction materials to be used in the project. The construction contract may call for the contractor to purchase and install all of the material, or it may call for the owner to purchase some of the material for installation by the contractor. Material that has been procured by the owner is termed owner-furnished material, or OFM. If the owner is the federal government, the material is termed GFM.

2.4 BASES FOR PREPARATION OF THE CONSTRUCTION PROJECT SCHEDULE

2.4.1 Arbitrary Basis

The owner may dictate that a project must start and end on specified dates and that major element of the project must also start and end on specified dates.