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Introduction

Most project management books focus on the management of building projects, such as housing, administration, and commercial building projects. Likewise, most engineering faculties focus on housing projects in their curricula, while industrial projects are, for the most part, in the oil and gas sector and other process industries. The aim of this book is to focus on the main tools of project management that are essential to industrial projects, focusing on, but not limited by, projects in the oil and gas sector.

A good place to start, for anyone wishing to be a project manager, is to obtain a Project Management Professional (PMP) certificate, which is a credential offered by the Project Management Institute (PMI). As of March 31, 2010, there were 375,959 active PMP certified individuals worldwide.

This credential is obtained by documenting 3 to 5 years of work experience in project management, completing 35 hours of project management related training, and scoring a certain percentage of questions on a written, multiple choice examination.

This book provides questions and answers for the subjects that are more traditional in the PMP exam, but it will be more beneficial to focus on practical life applications, so these questions are tailored

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to help in situations that are faced in real projects. It would not be beneficial to take this exam and receive certification but later fail in real, practical projects.

The definition of a project is a series of activities that have a start and finish time. A project, in general, is unique, and no project is similar to another. This is very important, because one should know that the problem one may face in managing a project may be unique. Also, one should have a creative mind in order to get to the right solution without a reference, so that the professionalism of the project manager depends on his or her previous experience.

Real life is like the theater, where everyone has a role in the story. So, you may be in the project play as an owner, engineering office, contractor, supplier, or service provider doing logistic service for the project. You may be at a higher level in the organization or at a lower level. In any case, you play a role in this story, so you should understand the whole story – who does what, and who is responsible for this and that issue. With this information, you will succeed at any project you are working on.

Chapter two discusses the scope of projects and the main characteristics of project management. To have a complete grasp of project management, one must first understand these basic principles and see how they work in the real world.

For us as engineers, a feasibility study is a mystery, because we are rarely working in this phase. Chapter three explains our role as engineers in the feasibility study. This chapter presents the main tools of economics to use in deciding whether to proceed with the new project. It also describes the scientific way to choose between the various alternatives. The principal of statistics is described in this chapter, in addition to the theory of probability from a practical point of view, and how we can use these tools to make the right decision. The Monte-Carlo simulation technique is presented, as it is the main tool in a feasibility study for oil and gas projects, which is the main tool that we use in the decision tree method. The decision tree method is very important and easy to use, and anyone who has read about it or attended a course on it is eager to apply it. However, the actual application of this method can be difficult. In this chapter, a practical way of applying the decision tree method in conjunction with the Monte-Carlo simulation is presented.

Time management is a primary tool in project management. There are many methods for making a time schedule for a project, and these methods will be discussed in chapter four. In addition, a

method for estimating activities and project time using a traditional case study in a petrochemical project will be presented in this chapter.

Resources management is another element in project management. Resource management is the main area that should be controlled by the project manager and the team member. Chapter five provides the key to understanding resources management for the project manager and the team member, as well. It is very important that when you join a new project the team members know what the project manager is looking for and what he or she has in mind when choosing the team members. The project manager should have special skills and experience, as he or she is responsible for implementing project management strategy when handling an international project with labor from different countries and different cultures. The distribution of resources on a time schedule will also be discussed in chapter five.

Another main element in project management is cost. Therefore, chapter six presents a way to predict the cost estimate in each phase of a project, a way to define the project budget, and a method for monitoring the project cost during the project's time-frame.

Older project management principals focus on time, cost, and quality. Nowadays, and especially in our case as we are discussing the management for petrochemical, power stations, and other middle sized industrial projects, safety, health, and the environment are very important to these types of projects, and in some cases they will be the big challenges facing project managers and project sponsors. Therefore, the four elements presented in Figure (1.1) are the main constraints to project managers' decisions and should be managed by a project manager and his or her team members. This will also be covered in chapter six.

Contracts are the chain that connects the primary parties of the projects, such as the owners, the engineering firm, and the contractors. Chapter seven describes the tender and bidding procedure and some of the ways to evaluate the bidders technically and commercially, especially in an international environment.

The market is open, and as an owner you can choose any contractors or engineering firm from any country all over the world, so there is a lot of competition between international companies to provide good quality to their products or services. Therefore, all the international companies follow the standards of the International Organization for Standardization (ISO) and apply the total quality management system as stated by the ISO. This will be discussed from a practical standpoint in chapter eight.

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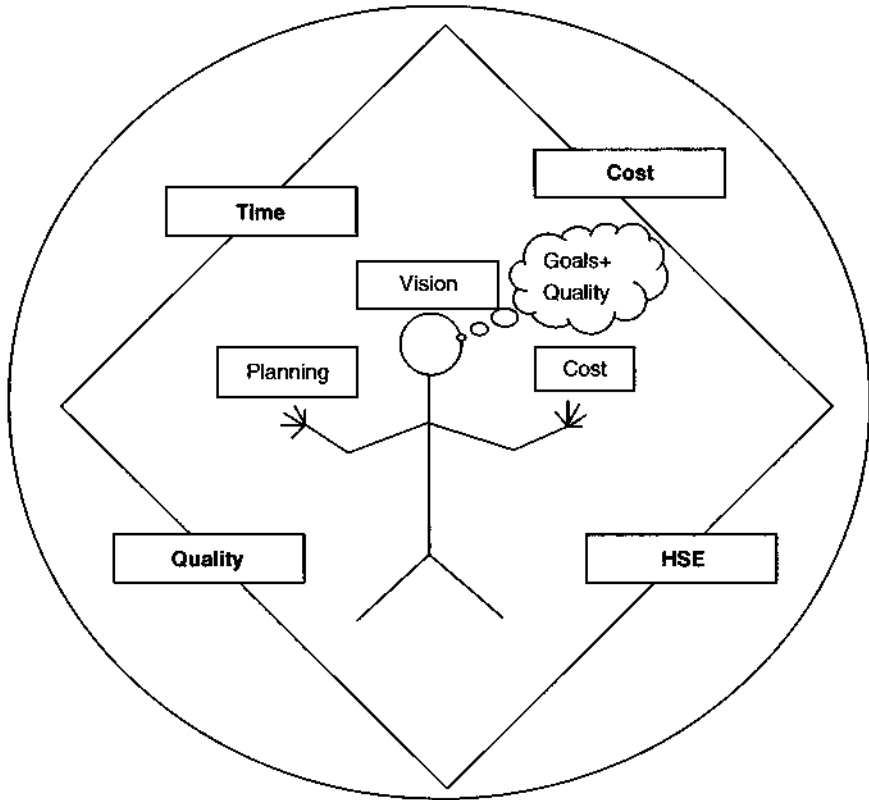


Figure 1.1 Project manager constraints.

Before starting a project, one should have a scientific way to expect the problems that he or she will face on the project during implementation and to solve them in a timely manner without affecting cost, time-frame, and quality. Risk assessment, which is discussed in chapter three, is about economic assessment, and this form of risk assessment is essentially qualitative. It is not feasible in the implementation phase. For that phase, a more quantitative risk assessment is appropriate, in order to execute the project properly. This is discussed in chapter nine.

In chapter ten there are one hundred questions with answers that may be seen on the PMP exam. However, these questions are chosen to serve our practical purposes, as these questions are not for the exam but are complementary for a project that presents these practical cases.