

# 8

# Cost Estimating and Budgeting

*Mohamed Salama*

## Learning objectives

By the time you have completed this chapter you should be able to:

- Discuss the concept of cost estimating
- Understand the various stages of cost estimating
- Compare and contrast the micro and macro approaches to cost estimating
- Discuss the various cost items and different methods used in cost estimating.
- Discuss the factors that affect the accuracy of cost estimates.
- Compare and contrast different bidding strategies.
- Construct a time-phased project budget
- Draw a project s-curve to illustrate project cash-flows
- Appreciate the importance of cost provisions and contingencies.

## Introduction

Project schedules cannot be finalised until the resources have been allocated to different activities and work packages. A resource can be any entity required to accomplish the scheduled activity. This includes all the funds, people, equipment and materials required to achieve the project deliverables. This is sometimes known as the four Ms, referring to Money, Man, Machinery and Materials. All resources have costs associated to them which determine if the project is viable in the first instance. It is the project manager's responsibility to monitor the estimate of the project costs and ensure the availability of resources required for completion of the project. This chapter begins by discussing the different approaches to

cost estimating, investigating the main cost items and the key factors that should be considered during the cost estimating process amid the resource constraints imposed on a project. The chapter then discusses the accuracy of cost estimates and concludes by demonstrating how to create a time-phased budget, which is used to monitor and control project expenditure.

## 8.1 Types of project costs

Besides the cost of resources, the total project expenditure also includes other cost drivers such as overhead expenses and facilities. It is essential that all cost drivers are identified at the early stages of the project lifecycle as this ensures that budgets are based on accurate information and include all the costs associated with the project. Within any project, cost drivers fall into two categories:

- Direct costs
- Indirect costs

### ■ Direct costs

These are costs that are clearly specific to a project or individual work package and include:

- **Labour:** These are the human resources working on the project and often represent its biggest cost. They include the project team, external consultants and all personnel identified on the OBS. Labour costs are calculated either by set fixed fee or by an hourly rate.
- **Equipment:** People working on a project normally require some form of equipment in order to perform their task. This could range from a computer to specialist machinery. Equipment costs are calculated by the daily/weekly hire of the equipment or when necessary, the purchase of equipment
- **Material:** Most projects require materials in order to be realised. These are the inputs of the project that are transformed into a project deliverable through the project being executed. For example, brick for construction projects, film for advertising projects or paper for printing projects. Material costs are calculated on the quantity of the material required.
- **Facilities:** Some projects are performed remotely from the participating organisation and require independent facilities such as office accommodation, utilities and other consumables.

## ■ Indirect costs

These are costs that cannot be clearly specified to a particular project and are incurred by multiple projects within the organisation. Indirect costs include:

- **Overheads:** Many projects are performed within the participating organisations facilities. Overhead costs include rent, rates, utilities and other consumables.
- **Salaries:** Projects draw on the support of administrative staff, senior management and even janitorial personal.
- **Equipment and machinery:** Essential equipment such as photocopiers, computers, telephones and facsimiles all have associated costs that cannot be directly apportioned to a project. This also includes software and licenses required by the organisation to perform the project.

## 8.2 Project cost estimating

Realising the project scope within the allocated costs is one of the key project management objectives. Quite often the success of a project is measured on the ability to deliver a project within the cost constraint, as evidenced by a recent survey conducted by the Standish Group (2004). This report found that an astonishing 83% of IT projects failed to be delivered within the allocated budget.

### ■ Cost estimating versus price forecasting

The definition for the term 'estimating', as stated in the *Concise Oxford Dictionary* refers to "a contractor's statement of a sum of money for which specified work will be undertaken" whereas the same source defines the term 'forecasting' as "a foresight or conjectural estimate of something scheduled to happen in the future".

Academic studies in the field of construction project management, for example Ashworth (1991) and Ferry & Brandon (1994), made no distinction between the two terms. Also, the Chartered Institute of Building (CIOB) and the RICS codes of practice used the term 'cost estimating' when they were referring to 'price forecasting'.

In some sectors, such as construction projects' cost planning and control, the following terms are commonly used: cost estimating, price forecasting and prediction. *Forecasting* is exclusively reserved for a future (uncertain) event whereas an *estimate* may also be applied to existing observable (measurable) situation. It