

# SIMULATION STUDIES: AN OVERVIEW

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# 4

## 4.1 Introduction

Before entering into a detailed description of each process involved in a simulation study, it is important to develop an overall view in order to understand how the processes interconnect. The aim of this chapter is to provide such a perspective by giving an overview of a simulation study. There are also a number of related issues concerning the time-scales for simulation studies, the membership of the project team, the software and hardware requirements, project costs and project selection. Having given an overview of a simulation study, each of these issues is discussed in turn. This chapter sets out the basics of performing simulation studies before the rest of the book goes on to describe each process in more detail.

## 4.2 Simulation Studies: An Overview of Key Modelling Processes

There are as many diagrams and descriptions that outline the key processes in a simulation study as there are authors who have written about the subject. Among them are Shannon (1975), Szymankiewicz *et al.* (1988), Hoover and Perry (1990), Ulgen (1991), Dietz (1992), Gogg and Mott (1992), Musselman (1992), Nordgren (1995), Shannon (1998), Law and Kelton (2000) and Banks *et al.* (2001). Each has their preferred way of explaining how to approach simulation modelling. A detailed inspection of these explanations shows that they are in the main very similar, outlining a set of processes that must be performed. The main differences lie in the naming of the processes and the number of sub-processes into which they are split. The outline of a simulation study described below is based in part on the work of Landry *et al.* (1983).

Figure 4.1 shows an outline of a simulation study. The boxes are the key stages in a study and represent the important deliverables:

- A *conceptual model*: a description of the model that is to be developed.
- A *computer model*: the simulation model implemented on a computer.

# INFORMATION GATHERING: UNOBTRUSIVE METHODS

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## LEARNING OBJECTIVES

Once you have mastered the material in this chapter you will be able to:

1. Recognize the value of unobtrusive methods for information gathering.
2. Understand the concept of sampling for information requirements analysis.
3. Construct useful samples of people, documents, and events for determining information requirements.
4. Create an analyst's playscript to observe decision-maker activities.
5. Apply the STROBE technique to observe and interpret the decision maker's environment.

Just by being present in an organization, the systems analyst changes it. However, unobtrusive methods such as sampling, investigation, and observing a decision maker's behavior and physical environment are less disruptive than other ways of eliciting information requirements. Unobtrusive methods are considered to be insufficient information gathering methods when used alone. Rather, they should be used in conjunction with one or many of the interactive methods studied in the previous chapter. This is called a multiple methods approach. Using both interactive and unobtrusive methods in approaching the organization is a wise practice that will result in a more complete picture of information requirements.

## SAMPLING

Sampling is the process of systematically selecting representative elements of a population. When these selected elements are examined closely, it is assumed that the analysis will reveal useful information about the population as a whole.

The systems analyst has to make a decision on two key issues. First, there are many reports, forms, output documents, memos, and Web sites that have been generated by members of the organization. Which of these should the systems analyst pay attention to, and which should the systems analyst ignore?

Second, a great many employees can be affected by the proposed information system. Which people should the systems analyst interview, seek information from via questionnaires, or observe in the process of carrying out their decision-making roles?