
Preface

The aim of this book is to help enable the use of the technique of simulation modelling in the organisation. There is an emphasis in the book on the implementation of the technique in organisations, rather than a detailed treatment of the mechanics of simulation software execution or the statistical analysis undertaken during a study. The focus in this text is on recent changes in the way simulation is used which have led to its wider use and provide the potential for a continued growth in use.

Chapter 1 provides an overview of the technique and gives details of where the technique can be applied in the organisation.

Chapter 2 provides evidence of previous and current survey research showing the use of simulation and the challenges ahead if usage is to be increased. A particular area of growth in the use of simulation is in service applications. This has led to an interest in the modelling of human behaviour in addition to the traditional simulation of material and information processes. A framework is presented indicating approaches to the challenge of modelling people in organisations to provide guidance for simulation practitioners.

Chapter 3 examines the physical and human resources that are necessary to enable a simulation capability within the organisation.

Chapter 4 outlines the steps required in undertaking a simulation project. In order to use simulation successfully a structured process must be followed. This chapter aims to show that simulation is about more than just the purchase and use of a software package but a range of skills are required by the simulation team. These include project management, client liaison, statistical skills, modelling skills and the ability to understand and map out organisational processes.

Chapters 5, 6 and 7 provide extensive case study research of the use of the simulation technique in the organisation. The material is organised under three themes that emerged from the case study investigations.

Chapter 5 covers the use of simulation within a process-centred change methodology. Business Process Simulation (BPS) is entering the mainstream of process improvement tools, in part on the back of process-centred change methodologies such as Business Process Management. It is generally accepted that the process perspective can deliver benefits and BPS can improve the chance of success by providing a tool for analysis. The process-based change methodology can provide context to the simulation technique in that it connects the aims of the

BPS study to the strategic objectives of the organisation and incorporates the consideration of human factors in order to achieve successful implementation of redesigned processes. Conversely the ability of BPS to incorporate system variability, scenario analysis and visual display of process performance makes it a useful technique to provide a realistic assessment of the need for and results of change.

Chapter 6 covers the use of qualitative outcomes of a simulation intervention. Simulation is found to have the ability to facilitate knowledge through the day-to-day process of undertaking the study, for example collecting the data and mapping the processes, and providing qualitative outcomes, for example an animation of the system incorporating individual elements such as people and materials.

Chapter 7 covers the use of simulation in combination with other improvement techniques. The Activity-Based Costing approach allows the actual costs to be traced to activities and so enables better resource allocation decisions. Reversing the flow of information allows the user to assess the effect of a change in the activity level on costs. Simulation is also shown in use in conjunction with the technique of system dynamics. It is shown that the system dynamics approach is particularly appropriate in analysing factors impacting on the organisational context of a simulation study and thus could be used to maximise the benefits of simulation. Finally the technique of Data Envelopment Analysis is shown to be a useful addition to the toolkit of a simulation analyst in that it is able to rank the relative performance of units across multiple input and output measures.

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