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Enabling a Simulation Capability in the Organisation



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Dedicated to
Philly, TJ,
Hugo and Humphrey

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.

Andrew Greasley, MBA PhD FHEA
November 2007

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Contents

1	Introduction to Simulation.....	1
	Introduction.....	1
	What is Simulation Modelling?	1
	Simulation and Variability.....	2
	Variability.....	2
	Interdependence.....	3
	Why Use Simulation?	4
	Disadvantages of the Simulation Method	5
	Summary.....	6
	References.....	6
2	The Usage of Simulation.....	7
	Introduction.....	7
	Published Surveys of the Use of Simulation.....	7
	A Survey of Simulation Use in the UK.....	9
	Where in the Organisation is Simulation Used?	12
	Manufacturing Applications	12
	Service Applications.....	13
	Modelling Human Behaviour with Simulation.....	13
	Methods of Modelling Human Behaviour	14
	Choosing a Method to Model Human Behaviour	17
	Summary.....	17
	References.....	18
3	Acquiring the Resources for Simulation.....	21
	Introduction.....	21
	Steps in Introducing Simulation.....	21
	1. Select Simulation Sponsor	21
	2. Evaluate Potential Benefits of Simulation	22
	3. Estimate Resource Requirements	22
	4. Selecting the Simulation Software Type.....	23
	5. Selecting the Simulation Software Package.....	26

6. Computer Hardware Requirements	27
7. Training	27
Summary	29
References	29
4 Steps in Building a Simulation Model.....	31
Introduction	31
1. Formulate the Simulation Project Proposal	31
Determining the Level of Usage of the Simulation Model	31
Managing the Simulation Project	33
The Simulation Project Proposal	36
2. Data Collection	39
Logic Data Required for the Process Map.....	39
Additional Data Required for the Simulation Model.....	39
3. Process Mapping	41
Activity Cycle Diagrams	42
Process Maps.....	42
4. Modelling Input Data.....	42
Less than 20 Data Points: Estimation	43
20+ Data Points: Deriving a Theoretical Distribution	43
200+ Data Points: Constructing an Empirical Distribution	44
Historical Data Points.....	44
5. Building the Model.....	44
6. Validation and Verification	44
Verification.....	45
Validation	46
7. Experimentation and Analysis.....	48
Statistical Analysis for Terminating Systems.....	49
Statistical Analysis for Non-terminating Systems	52
8. Presentation of Results	54
9. Implementation.....	55
Organisational Context of Implementation	55
Summary	57
References	57
5 Enabling Simulation – Simulation and Process Improvement Methodology	59
Introduction	59
Case Study 1: A Redesign of a Road Traffic Accident Reporting System Using Business Process Simulation	61
Introduction	61
The Road Traffic Accident Case Study.....	61
The Road Traffic Accident Business Process Simulation	63
Discussion	66

Case Study 2: Using Business Process Simulation Within a Business Process Reengineering Approach	67
Introduction	67
The Custody of Prisoner Process Case Study	67
Discussion.....	72
Case Study 3: Process Improvement Within a HR Division at a UK Police Force	75
Introduction	75
The HR Division Case Study.....	75
Discussion.....	81
Summary.....	83
References.....	85
6 Enabling Simulation – Qualitative Simulation.....	89
Introduction.....	89
Case Study 4: Using Simulation Modelling to Assess Service Reliability	89
Introduction	89
Case Study	90
The Simulation Study	91
Discussion.....	97
Case Study 5: The Case for the Organisational Use of Simulation.....	97
Introduction	97
Case Study.....	98
The Simulation Study	99
Simulation Model Analysis	100
Simulation Study Results.....	103
Discussion.....	103
Case Study 6: Using Simulation for Facility Design	106
Introduction	106
The Case Study.....	106
The Simulation Study	110
Discussion.....	114
Summary.....	115
References.....	116
7 Enabling Simulation – Simulation and OR Techniques.....	119
Introduction.....	119
Case Study 7: A Simulation Analysis of Arrest Costs	121
Introduction	121
Activity Based Costing – Committed and Flexible Resource.....	122
The Simulation Study	123
Discussion.....	129

Case Study 8: Using System Dynamics in a Discrete-event Simulation Study	130
Introduction	130
The Manufacturing Process	131
The Discrete-event Simulation Study	133
The System Dynamics Study	136
Discussion	140
Case Study 9: The Use of Data Envelopment Analysis in a Discrete-event Simulation Study	141
Introduction	141
Preliminary Data Analysis	141
The Initial DEA Assessment	142
Further Investigations	142
Simulation Case Study: The Redesign of the Crime Arrest Process at a UK Police Force	143
Discussion	144
Summary	145
References	146
Index	151