

SIMULATION MODELLING OF BUSINESS PROCESSES

Ray J. Paul, Vlatka Hlupic, George M. Giaglis
Brunel University, Department of Information Systems and Computing
Uxbridge, Middlesex UB8 3PH

Tel: 01895 – 203 374
Fax: 01895 – 251 686
E-mail: Ray.Paul@brunel.ac.uk

ABSTRACT

Increasingly, organisations need to adapt to new conditions and competitive pressures. Various change management approaches such as business process re-engineering have been developed to meet this perceived need. This paper investigates the potential of simulation modelling for modelling business processes. After a discussion on business processes related issues, an overview of business process modelling methods is presented. The usability of simulation modelling for evaluating alternative business process strategies is investigated. Finally, a framework for business process simulation is proposed.

INTRODUCTION

It is claimed that the increasing competitive pressures that organisations face encourages them to minimise the time it takes to develop the product, bring products to market and service customers whilst maximising profits. This pressure has made Business Process Re-engineering (BPR) a popular topic in organisational management and created new ways of doing business (Tunay, 1995). BPR relates to the fundamental rethinking and radical redesign of an entire business system to achieve significant improvements in performance of the company.

Many leading organisations have conducted BPR in order to improve productivity and gain competitive advantage. For example, a survey of 180 US and 100 European companies found that 75% of these companies had engaged in significant re-engineering efforts in the past three years (Jackson, 1996). However, despite the number of companies involved in re-engineering, the rate of failure in re-engineering projects is over 50% (Hammer and Champy, 1993). Some of the frequently cited problems related to BPR include the inability to predict the outcome of a radical change, difficulty in capturing existing processes in a way that can be seen by multidisciplinary team members, shortage of creativity in process redesign, cost of implementing the new process, or inability to recognise the dynamic nature of the processes.

Simulation Modelling For Business

Manuel Laguna, Johan Marklund



Simulation Modelling For Business:

Simulation Modelling for Business Andrew Greasley,2004 Simulation Modelling for Business is a comprehensive textbook ideal for use on undergraduate and postgraduate courses The first section of the book provides a definition of simulation modelling and describes the skills and resources required to undertake a successful simulation study Types of simulation are assessed and the basic concepts behind the method are outlined The main part of the book follows the steps involved in conducting a simulation study and provides a practical guide to building a simulation model and to implementing the results Reference is made throughout to ARENA SIMUL8 and WITNESS systems used in industry and widely available to students Case studies from manufacturing and service industries demonstrate the effectiveness of the approach and chapter questions are provided to assist learning

Simulation Modelling for Business Andrew Greasley,2017-03-02 Simulation Modelling has been used for many years in the manufacturing sector but has now become a mainstream tool in business situations This is partly because of the popularity of Business Process Reengineering BPR and other process based improvement methods that use simulation to help analyse changes in process design This text book includes case studies in both manufacturing and service situations to demonstrate the usefulness of the approach A further reason for the increasing popularity of the technique is the development of business orientated and user friendly windows based software This text provides a guide to the use of ARENA SIMUL8 and WITNESS simulation software systems which are widely used in industry and available to students Overall this text provides a practical guide to building and implementing the results from a simulation model All the steps in a typical simulation study are covered including data collection input data modelling and experimentation

Simulation Modelling Andrew Greasley,2022-09-21 While simulation has a vast area of application this textbook focuses on the use of simulation to analyse business processes It provides an up to date coverage of all stages of the discrete event simulation DES process covering important areas such as conceptual modelling modelling input data verification and validation and simulation output analysis The book is comprehensive yet uncomplicated covering the theoretical aspects of the subject and the practical elements of a typical simulation project demonstrated by cases examples and exercises It also shows how simulation relates to new developments in machine learning big data analytics and conceptual modelling techniques Guidance is provided on how to build DES models using the Arena Simio and Simul8 simulation software and tutorials for using the software are incorporated throughout Simulation Modelling offers a uniquely practical and end to end overview of the subject which makes it perfect required or recommended reading for advanced undergraduate and postgraduate students studying business simulation and simulation modelling as part of operations research business analytics supply chain management and computer science courses

Simulating Business Processes for Descriptive, Predictive, and Prescriptive Analytics Andrew Greasley,2019-10-21 This book outlines the benefits and limitations of simulation what is involved in setting up a simulation capability in an organization the steps involved in

developing a simulation model and how to ensure that model results are implemented In addition detailed example applications are provided to show where the tool is useful and what it can offer the decision maker In *Simulating Business Processes for Descriptive Predictive and Prescriptive Analytics* Andrew Greasley provides an in depth discussion of Business process simulation and how it can enable business analytics How business process simulation can provide speed cost dependability quality and flexibility metrics Industrial case studies including improving service delivery while ensuring an efficient use of staff in public sector organizations such as the police service testing the capacity of planned production facilities in manufacturing and ensuring on time delivery in logistics systems State of the art developments in business process simulation regarding the generation of simulation analytics using process mining and modeling people s behavior Managers and decision makers will learn how simulation provides a faster cheaper and less risky way of observing the future performance of a real world system The book will also benefit personnel already involved in simulation development by providing a business perspective on managing the process of simulation ensuring simulation results are implemented and that performance is improved *Business Process Modeling, Simulation and Design* Manuel Laguna,Johan

Marklund,2018-12-07 *Business Process Modeling Simulation and Design* Third Edition provides students with a comprehensive coverage of a range of analytical tools used to model analyze understand and ultimately design business processes The new edition of this very successful textbook includes a wide range of approaches such as graphical flowcharting tools cycle time and capacity analyses queuing models discrete event simulation simulation optimization and data mining for process analytics While most textbooks on business process management either focus on the intricacies of computer simulation or managerial aspects of business processes this textbook does both It presents the tools to design business processes and management techniques on operating them efficiently The book focuses on the use of discrete event simulation as the main tool for analyzing modeling and designing effective business processes The integration of graphic user friendly simulation software enables a systematic approach to create optimal designs **Introduction to Business**

Analytics Using Simulation Jonathan P. Pinder,2022-02-06 *Introduction to Business Analytics Using Simulation* Second Edition employs an innovative strategy to teach business analytics The book uses simulation modeling and analysis as mechanisms to introduce and link predictive and prescriptive modeling Because managers can t fully assess what will happen in the future but must still make decisions the book treats uncertainty as an essential element in decision making Its use of simulation gives readers a superior way of analyzing past data understanding an uncertain future and optimizing results to select the best decision With its focus on uncertainty and variability this book provides a comprehensive foundation for business analytics Students will gain a better understanding of fundamental statistical concepts that are essential to marketing research Six Sigma financial analysis and business analytics Teaches managers how they can use business analytics to formulate and solve business problems to enhance managerial decision making Explains the processes needed to

develop report and analyze business data Describes how to use and apply business analytics software Offers expanded coverage on the value and application of prescriptive analytics Includes a wealth of illustrative exercises that are newly organized by difficulty level Winner of the 2017 Textbook and Academic Authors Association's TAA Most Promising New Textbook Award in the prior edition *Enabling a Simulation Capability in the Organisation* Andrew Greasley, 2008-05-07 This book addresses the application of simulation modelling techniques in order to enable better informed decisions in business and industrial organisations The book's unique approach treats simulation not just as a technical tool but as a support for organisational decision making showing the results from a survey of current and potential users of simulation to suggest reasons why the technique is not used as much as it should be and what are the barriers to its further use

Business Intelligence and Modelling Damianos P. Sakas, Dimitrios K. Nasiopoulos, Yulia Taratuhina, 2021-01-31 This book highlights interdisciplinary insights latest research results and technological trends in Business Intelligence and Modelling in fields such as Business Intelligence Business Transformation Knowledge Dissemination Implementation Modeling for Logistics Business Informatics Business Model Innovation Simulation Modelling E Business Enterprise Conceptual Modelling etc The book is divided into eight sections grouping emerging marketing technologies together in a close examination of practices problems and trends The chapters have been written by researchers and practitioners that demonstrate a special orientation in Strategic Marketing and Business Intelligence This volume shares their recent contributions to the field and showcases their exchange of insights

Recent Advances in Information Systems and Technologies Álvaro Rocha, Ana Maria Correia, Hojjat Adeli, Luís Paulo Reis, Sandra Costanzo, 2017-03-27 This book presents a selection of papers from the 2017 World Conference on Information Systems and Technologies WorldCIST 17 held between the 11st and 13th of April 2017 at Porto Santo Island Madeira Portugal WorldCIST is a global forum for researchers and practitioners to present and discuss recent results and innovations current trends professional experiences and challenges involved in modern Information Systems and Technologies research together with technological developments and applications The main topics covered are Information and Knowledge Management Organizational Models and Information Systems Software and Systems Modeling Software Systems Architectures Applications and Tools Multimedia Systems and Applications Computer Networks Mobility and Pervasive Systems Intelligent and Decision Support Systems Big Data Analytics and Applications Human Computer Interaction Ethics Computers Health Informatics Information Technologies in Education and Information Technologies in Radiocommunications

Strategic Innovative Marketing Androniki Kavoura, Damianos P. Sakas, Petros Tomaras, 2016-09-26 This book presents the latest on the theoretical approach of the contemporary issues evolved in strategic marketing and the integration of theory and practice It seeks to make advancements in the discipline by promoting strategic research and innovative activities in marketing The book highlights the use of data analytics intelligence and knowledge based systems in this area In the era of knowledge based economy

marketing has a lot to gain from collecting and analyzing data associated with customers business processes market economics or even data related to social activities The contributed chapters are concerned with using modern qualitative and quantitative techniques based on information technology used to manage and analyze business data to discover hidden knowledge and to introduce intelligence into marketing processes This allows for a focus on innovative applications in all aspects of marketing of computerized technologies related to data analytics predictive analytics and modeling business intelligence and knowledge engineering in order to demonstrate new ways of uncovering hidden knowledge and supporting marketing decisions with evidence based intelligent tools Among the topics covered include innovative tourism marketing strategies marketing communications in small and medium sized enterprises SMEs the use of business modeling as well as reflecting on the marketing trends and outlook for all transportation industry segments The papers in this proceedings has been written by scientists researchers practitioners and students that demonstrate a special orientation in strategic marketing all of whom aspire to be ahead of the curve based on the pillars of innovation This proceedings volume compiles their contributions to the field highlighting the exchange of insights on strategic issues in the science of innovation marketing

Strategic Innovative Marketing Damianos P. Sakas, Dimitrios K. Nasiopoulos, 2019-05-25 This proceedings volume highlights cutting edge approaches for contemporary issues evolved in strategic marketing and the integration of theory and practice It focuses on strategic research and innovative activities in marketing that can be used in everyday operations The contributions have been divided into eight sections grouping emerging marketing technologies together in a close examination of practices problems and trends The first section examines management challenges which influence societies cultures networks organizations teams and individuals It emphasizes ways business processes foster innovation and facilitate management transitions from dominant structures to more evolutionary developmental paradigms The second section discusses the benefits and guidelines to implementation of green marketing strategies The following section pursues new perspectives of the role of location in marketing and its impact on consumer well being The next section explores the impacts of user generated content UGC on marketing theories and practice which is followed by a section identifying how market based assets can contribute to a sustainable competitive advantage The sixth section covers understanding consumer perception to make marketing decisions The final sections promote the use of business informatics and modeling in marketing and also the development of integrating information management in ways that change how people use information to engage in knowledge focused activities The papers from the proceedings of the 6th International Conference on Strategic Innovative Marketing IC SIM 2017 have been written by scientists researchers practitioners and students that demonstrate a special orientation in strategic marketing all of whom aspire to be ahead of the curve based on the pillars of innovation This proceedings volume shares their recent contributions to the field and showcases their exchange of insights on strategic issues in the science of innovation marketing

Organisation and Management Nick van Dam, Jos Marcus, 2007 You can

access these extras with the Campuz credit card included by the book [Handbook of Enterprise Integration](#) Mostafa Hashem Sherif,2009-11-09 Maintaining compatibility among all affected network and application interfaces of modern enterprise systems can quickly become costly and overwhelming This handbook presents the knowledge and practical experience of a global group of experts from varying disciplines to help you plan and implement enterprise integration projects that respond to business

Business Process Modeling, Simulation and Design, Second Edition Manuel Laguna,Johan Marklund,2013-04-25 Most textbooks on business process management focus on either the nuts and bolts of computer simulation or the managerial aspects of business processes Covering both technical and managerial aspects of business process management Business Process Modeling Simulation and Design Second Edition presents the tools to design effective business processes and the management techniques to operate them efficiently New to the Second Edition Three completely revised chapters that incorporate ExtendSim 8 An introduction to simulation A chapter on business process analytics Developed from the authors many years of teaching process design and simulation courses the text provides students with a thorough understanding of numerous analytical tools that can be used to model analyze design manage and improve business processes It covers a wide range of approaches including discrete event simulation graphical flowcharting tools deterministic models for cycle time analysis and capacity decisions analytical queuing methods and data mining Unlike other operations management books this one emphasizes user friendly simulation software as well as business processes rather than only manufacturing processes or general operations management problems Taking an analytical modeling approach to process design this book illustrates the power of simulation modeling as a vehicle for analyzing and designing business processes It teaches how to apply process simulation and discusses the managerial implications of redesigning processes The ExtendSim software is available online and ancillaries are available for instructors

[Business Risk and Simulation Modelling in Practice](#) Michael Rees,2015-08-03 The complete guide to the principles and practice of risk quantification for business applications The assessment and quantification of risk provide an indispensable part of robust decision making to be effective many professionals need a firm grasp of both the fundamental concepts and of the tools of the trade Business Risk and Simulation Modelling in Practice is a comprehensive in depth and practical guide that aims to help business risk managers modelling analysts and general management to understand conduct and use quantitative risk assessment and uncertainty modelling in their own situations Key content areas include Detailed descriptions of risk assessment processes their objectives and uses possible approaches to risk quantification and their associated decision benefits and organisational challenges Principles and techniques in the design of risk models including the similarities and differences with traditional financial models and the enhancements that risk modelling can provide In depth coverage of the principles and concepts in simulation methods the statistical measurement of risk the use and selection of probability distributions the creation of dependency relationships the alignment of risk modelling activities with general risk assessment

processes and a range of Excel modelling techniques The implementation of simulation techniques using both Excel VBA macros and the RISK Excel add in Each platform may be appropriate depending on the context whereas the core modelling concepts and risk assessment contexts are largely the same in each case Some additional features and key benefits of using RISK are also covered Business Risk and Simulation Modelling in Practice reflects the author s many years in training and consultancy in these areas It provides clear and complete guidance enhanced with an expert perspective It uses approximately one hundred practical and real life models to demonstrate all key concepts and techniques these are accessible on the companion website **Microsimulation Modelling of the Corporate Firm** F. W. van

Tongeren,1995-08-18 This book treats the modelling of individual corporate firms within an economy wide framework Microsimulation is used to bridge the gap between partial theories of firm behaviour and economy wide modelling The book gives practical guidelines for the construction and application of such micro macro models The microsimulation approach is applied to Dutch firms and the Dutch economy Simulation studies are conducted to study the relationship between the corporate firm and the economy which yields rich insights for the design of industrial policies Simulation Modeling Methods H. James Harrington,Kerim Tumay,2000 Computer simulation can save time resources money and risk in manufacturing The focus of this manual and CD ROM is to assist individuals in organisations who need to apply simulation to projects before committing resources and time *Microworld Simulations for Command and Control Training of Theater Logistics and Support Staffs* John Bondanella,1999 This report discusses changes in training structure content and methods with the focus on developing training for CSS staffs operating as staffs not for individual training The focus is on large unit staffs corps and echelons above corps headquarters and support commands The document discusses shortcomings of the current approach to CSS staff training and then proposes a process oriented approach It illustrates how microworld models can be used to train CSS processes It then goes on to describe how pilot testing of prototype models indicates that this approach is feasible for large unit staffs It concludes with a proposed training strategy that the authors believe is more appropriate and useful for meeting the challenges posed to the Army by personnel turbulence split based operations increased reliance on information and decreased training resources The authors believe this approach has applications beyond the CSS training environment They argue that the microworld models in a carefully designed training strategy are appropriate to any business that needs to train staff under distributed conditions in uncertain environments and to avoid time and resource intensive costs of bringing staff together for a large game in a central location **Simulation Modelling of Manufacturing Business Systems** Nenad Perši,2010 Simulation Modelling of Manufacturing Business Systems

Common Mistakes in System Dynamics Juan Martín García,2020-06-30 Creating a simulation model with System Dynamics is not easy there is the risk of making serious mistakes that force the model to remain unfinished after having dedicated days of work There are books and courses which show the steps to be taken in the process of creating a simulation

model but it is observed that some errors are repeated frequently This book offers a different approach instead of explaining how to create a simulation model it shows the mistakes that are usually made The book is designed for students who are looking for a quick manual to identify the most common mistakes made when creating simulation models by applying System Dynamics to correct them before presenting their research or work The experts will find in this book a list of points to check before making a presentation to their clients The content of the book allows the reader to identify the errors described and take them into account before submitting or publishing a work The most essential book for beginners and experts Content Causal Loop Diagram CLD 1 Guidelines 2 Definition of the elements 3 Loops and causal chains 4 Variable that depends on many 5 Variables in a positive sense 6 Variables that do not influence anything 7 Variables with signs 8 Confusing diagrams Stocks and Flows Diagram SFD 9 Guidelines 10 One variable only once 11 Coherence of flows and their levels 12 Flow concept 13 Levels without flows flows without levels 14 Levels only depend on flows 15 Arrows with signs 16 Uppercase for everything 17 Clouds that depend on variables 18 Variables that depend on two tables 19 It depends but it is constant 20 Do not look up from the paper 21 Badly connected flows 22 Impossible values The author Juan Mart n Garc a is teacher consultant and a worldwide recognized expert in System Dynamics with more than twenty years of experience in this field Ph D Industrial Engineer Spain and Postgraduated Diploma in Business Dynamics at Massachusetts Institute of Technology MIT USA He teaches Vensim online courses in <http://vensim.com> vensim online courses based on System Dynamics

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