

Global Supply Chain Simulation Harvard Solution

Supply Chain Simulation Supply Chain Simulation Simulation for Supply Chain Management Supply Chain Simulator Introduction to Operations and Supply Chain Simulation with AnyLogic Agent Based Simulation Approach to Assess Supply Chain Complexity and Its Impact on Performance Modeling, Simulation, and Optimization of Supply Chains A Modeling Framework for Supply Chain Simulation Supply Chain Simulation Strategic Supply Chain Management Using Simulation Supply Chain Management and Simulation Automatic Generation of Supply Chain Simulation Models from SCOR Based Ontologies Integrated Supply Chain Planning in Chemical Industry Towards Supply Chain Risk Analytics Creating a Corporate Strategy for Utilizing Supply Chain Simulation, Optimization and Visualization Discrete Event Simulations Integrated Supply Chain Simulation System – a Design Specification for a Generic Supply Chain Simulator The Dynamic Simulation of a Supply Chain Using the LORD Supply Chain Simulation Package Distributed Supply Chain Simulation (DISCIS) Prototype Software Hybrid Simulation Based Optimization for Supply Chain Management Francisco Campuzano Francisco Campuzano Caroline Thierry Christopher Michael Taylor Holt Dmitry Ivanov Mayolo Alberto López Castellanos Ciro D'Apice D. J. van der Zee Jacobus Petrus Catharinus Kleijnen Albert Ludwich Von Raubenheimer Kah Wai Chan Dayana Cope Thomas Kirschstein Iris Heckmann David Hancheng Chou Aitor Goti Shigeki Umeda Eoin C. O'Neill Leon Frankin McGinnis Nihar Sahay

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supply chain simulation allows readers to practice modeling and simulating a multi level supply chain the chapters are a combination of the practical and the theoretical covering knowledge of simulation methods and techniques the conceptual framework of a typical supply chain the main concepts of system dynamics and a set of practice problems with their corresponding solutions the problem set includes illustrations and graphs relating to the simulation results of the vensim program the main code of which is also provided the examples used are a valuable simulation tool that can be modified and extended according to user requirements the objective of supply chain simulation is to meet the demands of supply chain simulation or similar courses taught at the postgraduate level the what if analysis recreates different simulation scenarios to improve the decision making process in terms of supply chain performance making the book useful not only for postgraduate students but also for industrial practitioners

this book provides a detailed insight into the simulation approaches employed in the study of supply chain management and control it begins by examining the types of simulation models continuous simulation discrete event systems and simulation games before moving on to the distribution levels of systems and models it concludes with a thorough discussion of simulation products simulation methodologies and techniques are also covered throughout the text and case studies are included to highlight the pivotal role played by simulation in the decision making processes of those working in this field

this textbook introduces readers to the principles of business process and supply chain simulation modeling using the anylogic multimethod simulation software however the book is not a software manual instead it reinforces the fundamental concepts of process analysis and supply chain management through simulation models while simultaneously teaching the process of simulation modeling complex statistical and mathematical derivations are kept to a minimum while managerial decision making is emphasized simulation games are introduced as an engaging way to comprehend system structures the book is divided into four parts each with the same format presenting a motivating case study developing technical models providing step by step instructions for building anylogic simulation models and kpi dashboard design using the models for classroom games and decision making and discussing possible extensions for assignments or advanced studies the book is intended for undergraduate and master s students in supply chain and operations management as well as their instructors although some mathematical notation is necessary the content has been carefully selected for readers without an engineering or mathematics background readers are encouraged to build models while reading with the models becoming increasingly complex upon completing the book readers will have learned how to create their own simulation models using popular software gained a deeper understanding of operational and supply chain management concepts and attained the proficiency needed to apply key performance metrics for managerial decision making

in today s global business environment the intense competition the changing and uncertain conditions and the increasing customer s requirements are challenges for the companies operational efficiency and profitability in this context companies highlight the importance of supply chain design and its holistic understanding in order to achieve and sustain competitive strengths this book analyses supply chains as complex systems whose performance is characterized by their structural configuration and emergent behaviour the author analyses the supply chain structure and behaviour within the scope of complexity science he focuses on supply chain complexity by means of a literature review and an empirical research which give insights into the impact of complexity on supply chain performance moreover within this book the supply chain is modelled as a complex system by considering the non linear relationships of its geo positioned elements finally an agent based model is developed for the generic supply chain simulation which allows assessing the impact of complexity on supply chain performance and characterizing the behaviour of supply chain designs the materials presented in this book contribute to the understanding

and management of supply chain complexity this work complements existing complexity frameworks with a holistic analysis of complexity's impact on the performance of supply chain participants and their network the findings of this work are relevant for researchers interested in characterizing supply chain phenomena by enabling them to model supply chain structures and to simulate their emergent behaviour practitioners can benefit from the provided model and simulation platform by allowing them to dynamically assess the performance of their supply chain designs and strategy definitions by these means they improve their decision making and business profitability in all this book contributes towards the development of artificial intellig

this book offers a state of the art introduction to the mathematical theory of supply chain networks focusing on those described by partial differential equations the authors discuss modeling of complex supply networks as well as their mathematical theory explore modeling simulation and optimization of some of the discussed models and present analytical and numerical results on optimization problems real world examples are given to demonstrate the applicability of the presented approaches graduate students and researchers who are interested in the theory of supply chain networks described by partial differential equations will find this book useful it can also be used in advanced graduate level courses on modeling of physical phenomena as well as introductory courses on supply chain theory

in today's global economy the need for an efficient and optimised supply chain is increasing recent studies showed that supply chain management is one of the areas that have a great impact on the financial well being of an organization as well as customer satisfaction the recognition of the importance of efficient and optimised supply chains has led to increasing investments in supply chain planning and execution systems in order to compete in the global market place organizations want to develop systems that enable fast and effective on time delivery of products to customers therefore generating the necessary customer satisfaction today there are aps advanced planning scheduling systems available to help manage the supply chains these tools were specifically designed to have the ability to rapidly and simultaneously plan and schedule customer demand while considering material and capacity constraints not only does these systems provide the ability to increase revenues but it can also increase the customer service and cut costs by synchronized management of the complete

supply chain although these systems help to improve the system it is restricted to the static part and it does not incorporate the dynamic part the result therefore is that a lot of noise still exists within the system once the results are achieved this opened the way for solutions that can provide insight to the uncertainty and interdependency of processes and customer demand within the supply chain one way of gaining insight into the system variation and interdependencies is through the use of simulation technology this type of technology allows organizations to predict future behaviour and test future designs or do redesigns of their current supply chains the scope of this dissertation is to develop a supply chain planning methodology which will help to improve the understanding of the uncertainty and interdependency of processes within the supply chain to design this methodology different steps are taken in order to introduce the final solution therefore four main methods were used literature research market research supply chain planning methodology development and a case study the literature research brought to light the reasons for the inefficiencies and variations in supply chain planning and why the need for change exists during the supply chain market research several supply chain planning and execution systems were under study from this it was quite clear that the only way that organisations can ensure one optimal answer is when the demand is constant and there is a zero percent chance that it could change in real world systems it is virtually impossible to accurately predict future demand 100 percent of the time and therefore variability and randomness cannot be excluded from a supply chain solution this paved the way for the introduction of simulation technology as a possible solution for this variability and randomness the market research was concluded with the analyses of the current simulation solutions in the market the next step in the design phase was the introduction of the new supply chain planning methodology the main purpose of this new methodology is to use the power of modelling and simulation to improve the initial supply chain performance this methodology focuses on initial supply chain design analyses and optimisation by introducing this methodology organisations are now able to compare current supply chains with an unlimited realm of possible future configurations and without disrupting the initial day to day operations of an actual supply chain the methodology is also designed to help predict the supply chain performance in terms of throughput tardiness utilisation profitability and other key performance indicators in order to experience real life supply chain problems a case study has been done this case study is about the automotive industry which will include the ordering of parts assembly of vehicles warehousing and distribution of vehicles different problems and difficulties were experienced in conclusion this case study provided a better insight into the behaviour of a supply chain the case study

was used to evaluate the use of this new methodology and as a result certain inefficiencies were recognized as a result of the evaluation certain improvements need to be made to the supply chain methodology in order to make it more suitable for the market these improvements would focus on inventory planning supply chain analysis as well as database integration the result of the case study also showed that the supply chain planning methodology is now set to develop a supply chain solution on the lowest level there is however a need to be able to grow this supply chain methodology from a low level to a relatively high level these functions are among others higher level planning modules which focus on transportation production demand and distribution and performance measurements the focus will be to introduce these functions as objects every object will have the ability to design a supply chain solution on a high level or low level depending on the detail and requirements ☞ ☞ i also believe that the one who adapts his policy to the times prospers and likewise that the one whose policy clashes with the demands of the times does not 11 niccolo machiavelli 1525

if you are looking for a book on simulation in a warehouse or factory environment this book is for you this book takes an in depth look into the supply chain system of a semiconductor company and utilizes a system dynamics tool to detect demand indications and simulate the pipeline inventory companies can practicing a lot of management principals especially postponement strategies and supply chain management by how much does this actually work using a system dynamics approach to simulation modeling this book documents a research aiming to build a complete simulation model depicting the internal supply chain events from order to ship out the simulation model allows for the investigation and identification of discrepancies between the business policy and actual practice of key events in order to achieve supply chain optimization the simulation model also provides the means to comparison and measurement of the effectiveness of various supply chain strategies

in today s economy of global markets supply chain networks supplier customer relationship management and intense competition decision makers are faced with a need to perform decision making using tools that do not accommodate the nature of the changing market this research focuses on developing a methodology that addresses this need the developed methodology provides supply chain decision makers

with a tool to perform efficient decision making in stochastic dynamic and distributed supply chain environments the integrated methodology allows for informed decision making in a fast sharable and easy to use format the methodology was implemented by developing a stand alone tool that allows users to define a supply chain simulation model using scor based ontologies the ontology includes the supply chain knowledge and the knowledge required to build a simulation model of the supply chain system a simulation model is generated automatically from the ontology to provide the flexibility to model at various levels of details changing the model structure on the fly the methodology implementation is demonstrated and evaluated through a retail oriented case study when comparing the implementation using the developed methodology vs a traditional simulation methodology approach a significant reduction in definition and execution time was observed

thomas kirschstein provides an overview on methods and approaches for planning and optimizing large scale chemical production networks the focus is on an integrated modelling of chemical production processes logistical processes as well as environmental effects therefore a hybrid simulation framework is designed taking into account time series models for modelling chemical production processes linear optimization models for describing logistical processes as well as stochastic processes for modelling environmental effects

in this thesis iris heckmann develops a profound conceptual basis of supply chain risk analytics she transfers the newly defined concepts for the modelling and operationalization of supply chain risk within simulation and optimization approaches in order to ease unexpected deviations and disruptions which are subsumed under the notion of supply chain risk increasingly aggravating the planning and optimization of supply chains

computer based supply chain simulation optimization and visualization capability have changed significantly in the past 45 years expanding capability in lockstep with increases in computational power the increase in accessibility of relatively cheap and powerful hardware has led to the development of a multitude of supply chain simulation optimization and visualization programs catered towards reducing corporate supply chain costs some of these programs are commercial business to business offerings while a significant set are developed internally within the corporation expertise in this field is increasingly seen as an area of competitive advantage for modern goods based corporations however the

danger lies in executing decisions based upon inaccurate simulation results often meaning millions of dollars lost in waste rather than the desired savings this thesis aims to identify the needs of a corporation regarding supply chain simulation optimization and visualization particularly how a company may categorize offerings within this field how these programs may fit within the organizational context of a company and how to ensure correct utilization of a set of supply chain programs supply chain is very well understood but little focus has been placed on correctly utilizing these programs to support success for a company s goal of becoming operationally efficient a current state analysis of a major u s manufacturing company caterpillar inc was conducted and a new framework was applied to understand caterpillar s usage of supply chain programs this thesis utilizes findings from caterpillar as a sample case to reinforce research an overall strategy is developed based on research at caterpillar and supports the creation of a group of internal experts disassociated from specific supply chain specialties such as procurement or logistics in order to ensure global efficiency a generic strategy is presented for any corporation utilizing computer based supply chain simulation optimization and visualization

considered by many authors as a technique for modelling stochastic dynamic and discretely evolving systems this technique has gained widespread acceptance among the practitioners who want to represent and improve complex systems since des is a technique applied in incredibly different areas this book reflects many different points of view about des thus all authors describe how it is understood and applied within their context of work providing an extensive understanding of what des is it can be said that the name of the book itself reflects the plurality that these points of view represent the book embraces a number of topics covering theory methods and applications to a wide range of sectors and problem areas that have been categorised into five groups as well as the previously explained variety of points of view concerning des there is one additional thing to remark about this book its richness when talking about actual data or actual data based analysis when most academic areas are lacking application cases roughly the half part of the chapters included in this book deal with actual problems or at least are based on actual data thus the editor firmly believes that this book will be interesting for both beginners and practitioners in the area of des

supply chain management scm has been recognized as one of the key issues in the process industry the growing size of the distributed supply chain structures market dynamics and variability involved in the internal operations pose a challenge to efficiently managing the whole network globalization of supply chains and advances in information technology have led to a greater need for integrated operations as they have caused a more distributed network with potentially larger number of customers it is essential that the various bodies constituting the supply chain operate in an integrated manner and their activities are synchronized towards a common goal thus there is a need for efficient integration of information and decision making among the various functions of the supply chains the growing need for integrated information and decision making necessitates the development of a framework which allows the different entities of a supply chain to have access to a common information system as well as provides them with advanced decision making tools with the advancements in information technology it is possible for supply chain members to share information and several such tools are also commercially available however there is a need to combine intelligent decision making with information sharing to develop the required framework the main objective of this dissertation is the development of novel methodologies that will facilitate intelligent decision making and their application in the analysis of supply chains for chemical industries simulation models are used to depict supply chain dynamics so that they represent the decision making by various entities in order to obtain improved decision making a hybrid simulation based optimization framework is proposed the framework considers the decision rules followed by the different entities and guides the simulation model towards improved solutions the benefits of these methodologies include a more realistic representation of supply chain dynamics and reduced computational times for large scale problems the framework is applied to a number of case studies uncertainty in supply chain is also considered and the framework is used to determine the flexibility of the supply chain and manage risk under uncertainty a derivative free optimization method is also proposed which has been applied to optimize the performance of a multi enterprise supply chain network

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