

An Integrated Inventory Model For Three Tier Supply Chain

This book discusses recent developments in the vast domain of optimization. Featuring papers presented at the 1st International Conference on Frontiers in Optimization: Theory and Applications (FOTA 2016), held at the Heritage Institute of Technology, Kolkata, on 24–26 December 2016, it opens new avenues of research in all topics related to optimization, such as linear and nonlinear optimization; combinatorial-, stochastic-, dynamic-, fuzzy-, and uncertain optimization; optimal control theory; as well as multi-objective, evolutionary and convex optimization and their applications in intelligent information and technology, systems science, knowledge management, information and communication, supply chain and inventory control, scheduling, networks, transportation and logistics and finance. The book is a valuable resource for researchers, scientists and engineers from both academia and industry.

This book discusses inventory models for determining optimal ordering policies using various optimization techniques, genetic algorithms, and data mining concepts. It also provides sensitivity analyses for the models' robustness. It presents a collection of mathematical models that deal with real industry scenarios. All mathematical model solutions are provided with the help of various optimization techniques to determine optimal ordering policy. The book offers a range of perspectives on the implementation of optimization techniques, inflation, trade credit financing, fuzzy systems, human error, learning in production, inspection, green supply chains, closed supply chains, reworks, game theory approaches, genetic algorithms, and data mining, as well as research on big data applications for inventory management and control. Starting from deterministic inventory models, the book moves towards advanced inventory models. The content is divided into eight major sections: inventory control and management – inventory models with trade credit financing for imperfect quality items; environmental impact on ordering policies; impact of learning on the supply chain models; EOQ models considering warehousing; optimal ordering policies with data mining and PSO techniques; supply chain models in fuzzy environments; optimal production models for multi-items and multi-retailers; and a marketing model to understand buying behaviour. Given its scope, the book offers a valuable resource for practitioners, instructors, students and researchers alike. It also offers essential insights to help retailers/managers improve business functions and make more accurate and realistic decisions.

This book discusses recent advances and contemporary research in the field of cryptography, security, mathematics and statistics, and their applications in computing and information technology. Mainly focusing on mathematics and applications of mathematics in computer science and information technology, it includes contributions from eminent international scientists, researchers, and scholars. The book helps researchers update their knowledge of cryptography,

security, algebra, frame theory, optimizations, stochastic processes, compressive sensing, functional analysis, and complex variables.

This book examines the different motivational policies used for inventory management. In many competitive markets, sellers use motivational policies to encourage the customers to buy more and these kinds of strategies are used as competitive tools. This book brings together all the motivational policies for lot sizing decisions and offers a useful guide for inventory control. Each chapter applies deterministic inventory models such as economic order quantity (EOQ) and economic production quantity (EPQ), but also stochastic models for the motivational policy covered. The book begins exploring quantity discounts such as all-unit and incremental discounts. It then looks at delayed payment or trade credit policies that are applied by many suppliers and/or wholesalers to increase their sales. The motivational policies covered in the following chapters are dedicated to advance payment/prepayment schemes and also special sales offered by retailers to increase sales levels or decrease the inventory level. Finally the book concludes with a review of announced price increases, which persuades customers to buy a product at the current price, rather than paying more for it in the future. *Inventory Control Models with Motivational Policies* should be useful for professionals working on supply chains, but also researchers in operations research and inventory management.

This book presents the proceedings of the 4th International Manufacturing Engineering Conference and 5th Asia Pacific Conference on Manufacturing Systems (iMEC-APCOMS 2019), held in Putrajaya, Malaysia, on 21–22 August 2019. Covering scientific research in the field of manufacturing engineering, with focuses on industrial engineering, materials, processes, the book appeals to researchers, academics, scientists, students, engineers and practitioners who are interested in the latest developments and applications related to manufacturing engineering.

This book analyzes some of the most recent advances in the field of decision making and fuzzy systems applied to business and economics presented at the International Conference on Modeling and Simulation (MS'12 Rio de Janeiro), 10–13 December, 2012. In this conference, a special focus is given to the fundamental concept of sustainable development. Other key applications in business, economics and finance are also considered. In general, it is very useful for graduate students and researchers interested in pursuing research that combines quantitative techniques such as modeling and simulation and decision making with business and economic problems. This is especially useful when dealing with complex environments where the information is very uncertain and additional mathematical and statistical techniques are needed in order to understand the specific situations considered.

The proceedings of SocProS 2013 serve as an academic bonanza for scientists and researchers working in the field of Soft Computing. This book contains theoretical as well as practical aspects of Soft Computing, an umbrella term for

techniques like fuzzy logic, neural networks and evolutionary algorithms, swarm intelligence algorithms etc. This book will be beneficial for the young as well as experienced researchers dealing with complex and intricate real world problems for which finding a solution by traditional methods is very difficult. The different areas covered in the proceedings are: Image Processing, Cryptanalysis, Supply Chain Management, Newly Proposed Nature Inspired Algorithms, Optimization, Problems related to Medical and Health Care, Networking etc.

The book provides insights in the decision-making for implementing strategies in various spheres of real-world issues. It integrates optimal policies in various decisionmaking problems and serves as a reference for researchers and industrial practitioners.

Furthermore, the book provides sound knowledge of modelling of real-world problems and solution procedure using the various optimisation and statistical techniques for making optimal decisions. The book is meant for teachers, students, researchers and industrialists who are working in the field of materials science, especially operations research and applied statistics.

The purpose of supply chain management is to make production system manage production process, improve customer satisfaction and reduce total work cost. With indubitable significance, supply chain management attracts extensive attention from businesses and academic scholars. Many important research findings and results had been achieved. Research work of supply chain management involves all activities and processes including planning, coordination, operation, control and optimization of the whole supply chain system. This book presents a collection of recent contributions of new methods and innovative ideas from the worldwide researchers. It is aimed at providing a helpful reference of new ideas, original results and practical experiences regarding this highly up-to-date field for researchers, scientists, engineers and students interested in supply chain management.

"Due to the importance of costs as well as environmental effects of logistical activities throughout supply chains, such as inventory holding, freight transportation, and warehousing activities, this dissertation models and analyzes four integrated inventory control and transportation problems that account for economic and environmental aspects of a supply chain agents related decisions. The first model presents an integrated inventory control and transportation problem in a single item deterministic demand setting. A supply chain agents inventory control and transportation mode selection problem is solved under carbon cap, carbon cap and trade, carbon cap and offset, and carbon tax regulations. The second model focuses on an integrated inventory control and transportation problem in a single item stochastic demand setting integrating environmental objectives into a continuous review inventory control system with considerations of two different transportation modes. The third model studies an integrated inventory control and transportation problem in a multi-item deterministic demand setting, in which, a decision making method is developed considering the economic and environmental objectives. In the fourth model, a multi-item stochastic demand consolidation policy is analyzed with the consideration of heterogeneous freight trucks for transportation. It is shown that the consolidation policy suggested can result in substantial economic as well as environmental benefits for the supply chain agents"--Abstract, page iii.

The Economic Order Quantity (EOQ) inventory model first appeared in 1913, and in its centennial, it is still one of the most important inventory models. Despite the abundance of both classical and new research results, there was (until now) no

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comprehensive reference source that provides the state-of-the-art findings on both theoretical and applied research on the EOQ and its related models. This edited handbook puts together all these interesting works and the respective insights into an edited volume. The handbook contains papers which explore both the deterministic and the stochastic EOQ-model based problems and applications. It is organized into three parts: Part I presents three papers that provide an introduction and review of various EOQ related models. Part II includes four technical analyses on single-echelon EOQ-model based inventory problems. Part III consists of five papers on applications of the EOQ model for multi-echelon supply chain inventory analysis.

Annotation The information age we are living in makes it almost impossible for any organization to stick to the traditional ways of doing business. Organizations with a better handle on their supply chains can gain a distinct competitive advantage in today's market place. As a result, supply chain management has become vital; not just for success, but for survival in this new economy. *Successful Strategies in Supply Chain Management* examines this critical topic from all aspects. At the heart of the book is providing the tools and techniques for organizations to streamline their supply chain.

The evolution of industrial development since the 18th century is now experiencing the fourth industrial revolution. The effect of the development has propagated into almost every sector of the industry. From inventory to the circular economy, the effectiveness of technology has been fruitful for industry. The recent trends in research, with new ideas and methodologies, are included in this book. Several new ideas and business strategies are developed in the area of the supply chain management, logistics, optimization, and forecasting for the improvement of the economy of the society and the environment. The proposed technologies and ideas are either novel or help modify several other new ideas. Different real life problems with different dimensions are discussed in the book so that readers may connect with the recent issues in society and industry. The collection of the articles provides a glimpse into the new research trends in technology, business, and the environment.

Stock management and control is a critical element to the success and overall financial well-being of an organization. Through the application of innovative practices and technology, businesses are now able to effectively monitor their operations and manage their inventory by evaluating sales patterns and customer preferences. *Optimal Inventory Control and Management Techniques* explores emergent research in stock management and product control within organizations. Featuring diverse perspectives on the implementation of various optimization techniques, genetic algorithms, and datamining concepts, as well as research on big data applications for inventory management, this publication is a comprehensive reference source for practitioners, educators, and researchers in the fields of logistics, operations management, and retail management.

This book presents select peer-reviewed papers presented at the International Conference on Numerical Optimization in Engineering and Sciences (NOIEAS) 2019. The book covers a wide variety of numerical optimization techniques across all major engineering disciplines like mechanical, manufacturing, civil, electrical, chemical, computer, and electronics engineering. The major focus is on innovative ideas, current methods and latest results involving advanced optimization techniques. The contents provide a good balance between numerical models and analytical results obtained for different engineering problems and

challenges. This book will be useful for students, researchers, and professionals interested in engineering optimization techniques. This series is directed to diverse managerial professionals who are leading the transformation of individual domains by using expert information and domain knowledge to drive decision support systems (DSSs). The series offers a broad range of subjects addressed in specific areas such as health care, business management, banking, agriculture, environmental improvement, natural resource and spatial management, aviation administration, and hybrid applications of information technology aimed to interdisciplinary issues. This book series is composed of three volumes: Volume 1 consists of general concepts and methodology of DSSs; Volume 2 consists of applications of DSSs in the biomedical domain; Volume 3 consists of hybrid applications of DSSs in multidisciplinary domains. The book is shaped decision support strategies in the new infrastructure that assists the readers in full use of the creative technology to manipulate input data and to transform information into useful decisions for decision makers. This book collects select papers presented at the “International Conference on Mathematical Analysis and Application in Modeling,” held at Jadavpur University, Kolkata, India, on 9–12 January 2018. It discusses new results in cutting-edge areas of several branches of mathematics and applications, including analysis, topology, dynamical systems (nonlinear, topological), mathematical modeling, optimization and mathematical biology. The conference has emerged as a powerful forum, bringing together leading academics, industry experts and researchers, and offering them a venue to discuss, interact and collaborate in order to stimulate the advancement of mathematics and its industrial applications.

Coastal areas are remarkable regions with high spatiotemporal variability. A large population is affected by their physical and biological processes—resulting from effects on tourism to biodiversity and productivity. Coastal ecosystems perform several critical ecosystem services and functions, such as water oxygenation and nutrients provision, seafloor and beach stabilization (as sediment is controlled and trapped within the rhizomes of the seagrass meadows), carbon burial, as areas for nursery, and as refuge for several commercial and endemic species. Knowledge of the spatial distribution of marine habitats is prerequisite information for the conservation and sustainable use of marine resources. Remote sensing from UAVs to spaceborne sensors is offering a unique opportunity to measure, analyze, quantify, map, and explore the processes on the coastal areas at high temporal frequencies. This Special Issue on “Application of Remote Sensing in Coastal Areas” is specifically addresses those successful applications—from local to regional scale—in coastal environments related to ecosystem productivity, biodiversity, sea level rise. The present book includes a set of selected best papers from the 3rd International Conference on Recent Developments in Science, Engineering and Technology (REDSET 2016), held in Gurgaon, India, from 21 to 22 October 2016. The conference focused on the experimental, theoretical and application aspects of innovations in computational intelligence and provided a platform for the academicians and scientists. This book provides an insight into ongoing research and future directions in this novel, continuously evolving field. Many decades have been devoted to creating and refining methods and tools for computational intelligence such as Artificial Neural Networks, Evolutionary Computation, Fuzzy Logic, Computational Swarm Intelligence and Artificial Immune Systems. However, their applications have not yet been broadly disseminated. Computational intelligence can be

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used to provide solutions to many real-life problems, which could be translated into binary languages, allowing computers to process them. These problems, which involve various fields such as robotics, bioinformatics, computational biology, gene expression, cancer classification, protein function prediction, etc., could potentially be solved using computational intelligence techniques.

Adapting the development of information systems for operations management is essential for the effectiveness of an organization's business strategy. *Optimizing, Innovating, and Capitalizing on Information Systems for Operations* presents research on the applications of information systems and its influence on business and operations management. Highlighting case studies, frameworks and methodologies, this book aims to be useful for practitioners and academics in the fields of decision, management, and social sciences.

This book describes the latest advances in intelligent techniques such as fuzzy logic, neural networks, and optimization algorithms, and their relevance in building intelligent information systems in combination with applied mathematics. The authors also outline the applications of these systems in areas like intelligent control and robotics, pattern recognition, medical diagnosis, time series prediction, and optimization of complex problems. By sharing fresh ideas and identifying new targets/problems it offers young researchers and students new directions for their future research. The book is intended for readers from mathematics and computer science, in particular professors and students working on theory and applications of intelligent systems for real-world applications.

This book comprises select peer-reviewed contributions from the 6th International Conference on Production and Industrial Engineering (CPIE – 2019). The volume focuses on latest research in the field of Industrial and Systems Engineering, and its allied areas. Articles on variety of topics such as Human Factors Engineering, Lean Manufacturing, Six Sigma, Logistics and Supply Chain Management, Operations Research, Quality Engineering, Measurement and Control, Reliability and Maintenance Engineering, Green Supply Chain Management, Modelling and Simulation, Sustainability, Technology Management, Agile and Flexible Manufacturing, Technology Management and Computer Aided Manufacturing are discussed in this book. Given the range of topics covered, the book will be useful for students, researchers, and professionals interested in different areas of Industrial and Systems Engineering.

Production planning, inventory management, quality control, and maintenance policy are critical components of the manufacturing system. The effective integration of these four components gives a manufacturing operation the competitive edge in today's global market place. *Integrated Models in Production Planning, Inventory, Quality, and Maintenance* provides, in one volume, the latest developments in the integration of production, quality, and maintenance models. Prominent researchers, who are actively engaged in these areas, have contributed the topical chapters focused on the most recent issues in the area. In Part I, Ben-Daya and Rahim provide an overview of the literature dealing with integrated models for production, quality, and maintenance. Directions for future research are outlined. Part II contains six chapters (chapters 2 to 6) dealing with integrated models for production and

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maintenance. Part III deals with integrated production/inventory and quality models in chapters 7-11. Part IV focuses on quality and maintenance integrated models and contains two chapters. Part V deals with warranty, manufacturing, and quality and contains two chapters. Part VI addresses issues related to quality and contains three chapters (chapters 16-18).

Stock management and control is a critical element to the success and overall financial well-being of an organization. Through the application of innovative practices and technology, businesses are now able to effectively monitor their operations and manage their inventory by evaluating sales patterns and customer preferences. The Handbook of Research on Promoting Business Process Improvement Through Inventory Control Techniques is a critical scholarly resource that examines optimization techniques, data mining concepts, and genetic algorithms to manage inventory control. Featuring coverage on a broad range of topics such as logistics and supply chain management, stochastic inventory modelling, and inventory management in healthcare, this book is geared towards academicians, practitioners, and researchers seeking various research methods to get optimal ordering policy.

The International Conference on Industrial Engineering and Engineering Management is sponsored by the Chinese Industrial Engineering Institution, CMES, which is the only national-level academic society for Industrial Engineering. The conference is held annually as the major event in this arena. Being the largest and the most authoritative international academic conference held in China, it provides an academic platform for experts and entrepreneurs in the areas of international industrial engineering and management to exchange their research findings. Many experts in various fields from China and around the world gather together at the conference to review, exchange, summarize and promote their achievements in the fields of industrial engineering and engineering management. For example, some experts pay special attention to the current state of the application of related techniques in China as well as their future prospects, such as green product design, quality control and management, supply chain and logistics management to address the need for, amongst other things low-carbon, energy-saving and emission-reduction. They also offer opinions on the outlook for the development of related techniques. The proceedings offers impressive methods and concrete applications for experts from colleges and universities, research institutions and enterprises who are engaged in theoretical research into industrial engineering and engineering management and its applications. As all the papers are of great value from both an academic and a practical point of view, they also provide research data for international scholars who are investigating Chinese style enterprises and engineering management.

This book analyzes the underlying theoretical principles of multi-objective linear programming problems with multi-choice parameters. It studies transportation problems on the same domain with extension to fuzzy stochastic criteria, and offers insights into sensitivity analysis through symmetric duality and complementarity using non-convex programming. These analytical presentations provide ample scope for researchers to contemplate real-world problems with an innovative vision. The formulation, analysis and solution procedures on inventory control models in the book use both deterministic and fuzzy parameters, and provide novel optimal inventory policies. The book discusses a wide range of optimal operational techniques for policy makers,

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government and private agencies in the fields of e-governance and agricultural crop insurance, which are crucial for developing countries. The recommendations address the gaps and remedies in various schemes that influence decision-making in the context of the economic development of such countries.

Our rapidly changing world has forced business practitioners, in corporation with academic researchers, to respond quickly and develop effective solution methodologies and techniques to handle new challenges in supply chain systems. Supply Chain Optimization, Management and Integration: Emerging Applications presents readers with a rich collection of ideas from researchers who are bridging the gap between the latest in information technology and supply chain management. This book includes theoretical, analytical, and empirical research, comprehensive reviews of relevant research, and case studies of effective applications in the field of SCM. The use of new technologies, methods, and techniques are emphasized by those who have worked with supply chain management across the world for those in the field of information systems.

Advances in Manufacturing Technology XVII continues a well-respected series with the papers presented at the 1st International Conference on Manufacturing Research (ICMR 2003) - incorporating the 19th National Conference on Manufacturing Research (NCMR). This essential text provides a thorough review of all aspects of manufacturing engineering and management and will be of interest to all those involved in this rapidly advancing sphere of mechanical and manufacturing engineering. Topics covered include Machining Processes and Tooling Forming Processes and Tools Advanced Manufacturing Techniques Advanced Manufacturing Systems Design Methods, Processes, and Systems CAD/CAM Testing/Experimentation/Metrology Internet and E-design/Manufacture Virtual Enterprise and Enterprise Integration

"This study analyzes an integrated inventory control and supplier selection problem in stochastic demand environment under carbon emissions regulations. In particular, a continuous review inventory model with multiple suppliers is investigated under carbon taxing and carbon trading regulations. We analyze and compare the optimal supplier selection and order splitting decisions with single sourcing and two alternative delivery structures for multi-sourcing, namely, sequential ordering and sequential delivery. For each of the three ordering policies, a solution method is proposed and these policies are compared in terms of their economic as well as environmental performances. A numerical study is conducted to demonstrate the efficiencies of the solution methods proposed. Further numerical studies analyze how the economic and environmental performances of different ordering policies vary as the supplier capacities and lead times change"--Abstract, page iv.

This two-volume book presents outcomes of the 7th International Conference on Soft Computing for Problem Solving, SocProS 2017. This conference is a joint technical collaboration between the Soft Computing Research Society, Liverpool Hope University (UK), the Indian Institute of Technology Roorkee, the South Asian University New Delhi and the National Institute of Technology Silchar, and brings together researchers, engineers and practitioners to discuss thought-provoking developments and challenges in order to select potential future directions The book presents the latest advances and innovations in the interdisciplinary areas of soft computing, including original research papers in the areas including, but not limited to, algorithms (artificial immune systems,

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artificial neural networks, genetic algorithms, genetic programming, and particle swarm optimization) and applications (control systems, data mining and clustering, finance, weather forecasting, game theory, business and forecasting applications). It is a valuable resource for both young and experienced researchers dealing with complex and intricate real-world problems for which finding a solution by traditional methods is a difficult task.

This is a revision of a classic which integrates managerial issues with practical applications, providing a broad foundation for decision-making. It incorporates recent developments in inventory management, including Just-in-Time Management, Materials Requirement Planning, and Total Quality Management.

Predictive analytics refers to making predictions about the future based on different parameters which are historical data, machine learning, and artificial intelligence. This book provides the most recent advances in the field along with case studies and real-world examples. It discusses predictive modeling and analytics in reliability engineering and introduces current achievements and applications of artificial intelligence, data mining, and other techniques in supply chain management. It covers applications to reliability engineering practice, presents numerous examples to illustrate the theoretical results, and considers and analyses case studies and real-world examples. The book is written for researchers and practitioners in the field of system reliability, quality, supply chain management, and logistics management. Students taking courses in these areas will also find this book of interest. This book is based on the research papers presented during The Institute of Industrial Engineers Asian Conference 2013 held at Taipei in July 2013. It presents information on the most recent and relevant research, theories and practices in industrial and systems engineering. Key topics include: Engineering and Technology Management Engineering Economy and Cost Analysis Engineering Education and Training Facilities Planning and Management Global Manufacturing and Management Human Factors Industrial & Systems Engineering Education Information Processing and Engineering Intelligent Systems Manufacturing Systems Operations Research Production Planning and Control Project Management Quality Control and Management Reliability and Maintenance Engineering Safety, Security and Risk Management Supply Chain Management Systems Modeling and Simulation Large scale complex systems

We are pleased to welcome readers to this issue of the Journal of Applied Operational Research (JAOR), Volume 5, Number 2. The journal reports on developments in all aspects of operational research, including the latest advances and applications. It is a primarily goal of the journal to focus on and publish practical case studies which illustrate real-life applications.

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