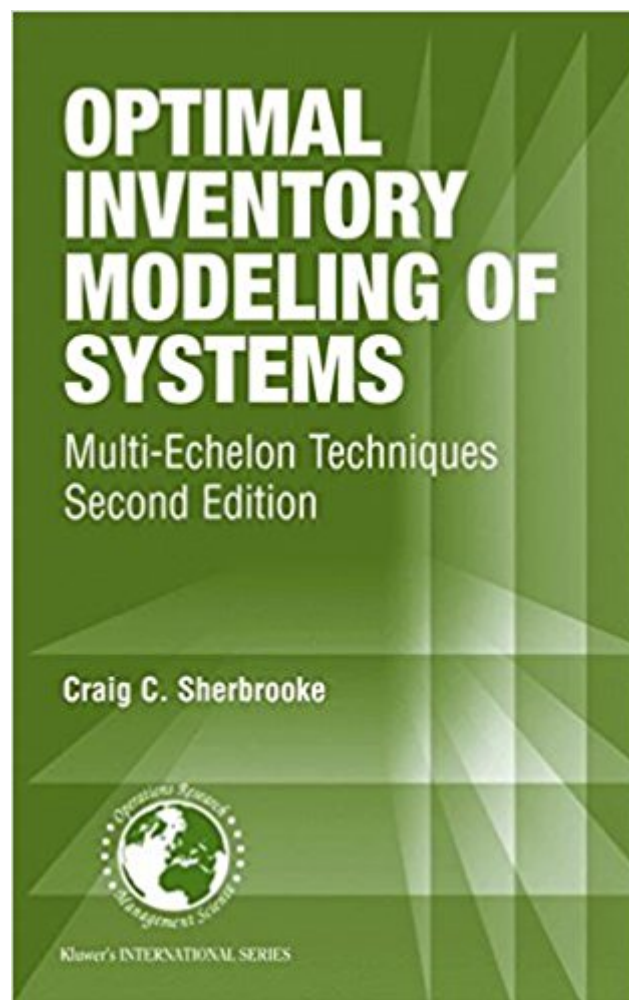




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# Optimal Inventory Modeling Of Systems: Multi-Echelon Techniques (International Series In Operations Research & Management Science)



## Synopsis

Most books on inventory theory use the item approach to determine stock levels, ignoring the impact of unit cost, echelon location, and hardware indenture. Optimal Inventory Modeling of Systems is the first book to take the system approach to inventory modeling. The result has been dramatic reductions in the resources to operate many systems - fleets of aircraft, ships, telecommunications networks, electric utilities, and the space station. Although only four chapters and appendices are totally new in this edition, extensive revisions have been made in all chapters, adding numerous worked-out examples. Many new applications have been added including commercial airlines, experience gained during Desert Storm, and adoption of the Windows interface as a standard for personal computer models.

## Book Information

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## Customer Reviews

About the first edition: "This book is a remarkable review and summary of nearly 30 years work on applied inventory theory. The book is a model of clarity and coherence. Even those concerned with other problem domains may benefit from the distilled wisdom it offers." (Interfaces - Professor Steve New, University of Manchester) "A large number of solved numerical examples help with the understanding of the models and mathematics used. Undoubtedly, a book of such integrity deserves a place on the shelf of any person, library or organization whose interests lie in the domain of inventory theory and its application to complex systems." (Logistics Spectrum - Professor Mirce

Knezevic, Exeter University) About the second edition: "In the second edition, the basics remain the same and should be considered essential knowledge for logisticians and system managers. Sherbrooke has spent his career solving real inventory problems. Practical examples help the reader understand critical concepts like marginal analysis, expected backorders, cost-availability curves, optimization, and analytical versus simulation based models. In *Optimal Inventory Modeling of Systems*, Sherbrooke tells us how we (public and private sector managers) can better understand and act on the critical trade-offs between cost and system availability. This reference text should be on your bookshelf." (George T. Babbitt, General, USAF (Retired), Formerly Commander, Air Force Material Command; Director, Defense Logistics Agency)

Discusses the utilization of inventory planning, demand forecasting and inventory modeling methods that can be used to manage the inventory needs of manufacturing companies. Addresses complex inventory problems now manageable due to increased computer power and computer literacy; covers the implementation of inventory methods that often compete within different management groups; and uses systems analysis to determine appropriate inventory policies. --This text refers to an out of print or unavailable edition of this title.

Excerpted from the original Logistics Spectrum review by Dr. Jezdimir Knezevic, 1993 The book is written for the logistician who is concerned with the achievement of the required operational availability of systems, and whose main objective and responsibility is to make decisions related to inventory items, item location and investment in spares. The optimization methodology developed considers trade-offs between stock at the operating locations and supporting depots (also called the multi-echelon problems), and between stock levels for an item and its sub-items (also called the multi-indenture problems). All models developed are on an analytical nature, which provides the decision-maker with an efficient tool for the determination of optimal stockage policies. The philosophical concepts of the book are addressed in Chapter 1, followed by the corresponding mathematical techniques in Chapter 2. Chapter 3 covers the mathematics related to the joint optimization of stock levels at operating and stockage/supporting bases. The estimation of demand rates that do not stay constant is considered in Chapter 4, where the negative binomial is used as a model, together with models that are based on the Poisson distribution (variance-to-mean ratios equal to one). The mathematics for a multi-echelon, multi-indenture optimization are developed in Chapter 5. The problem concerning periodic resupply for repairable items is addressed in Chapters 6 and 7. The associated concept is subsequently illustrated through an example application related

to the Space Station Freedom. The main subject of Chapter 8 is the cannibalization problem and the associated mathematics. The last chapter, Chapter 9, of the textbook is dedicated to practical real-world problems relating to modeling and application of models, where both advantages and disadvantages are analyzed. Undoubtedly, a book of of such great integrity deserves a place on the shelf or any person, library, or organization whose interests lie in the domain of inventory theory and its application to complex systems.

This book is written in such manner that little previous knowledge is required on the subject because of clearness and complexitiy of this book. Author first takes the reader through "physics" of multi echelon, multi indenture spares inventory allocation problem. Then he develops theory and analytical models for spares inventory allocation optimization in such an environment. The theory is build up gradually - adding more complexity in each chapter. After completing this book reader should be able to use this models for real problems solving. What I appreciate too is that there are enough informations on customization of those models for those who want to include more conditions in them.

This book offers a great detail in building the basis for multi-echelon and mult-indenture spare inventory models, and the most importantly - the key ideas behind every mathematical equation and model assumption. The author also put a lot of emphasis on the efficient implementation of the models, which is particularly useful for the practitioners. However, the readers should be very careful with the errors in this book, especially those in the formulas and exercises...

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