

Book Review

Supply Chain Engineering: Useful Methods and Techniques

by Alexander Dolgui and Jean-Marie Proth,

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Several influence factors, such as globalization of markets, integration of activities from product ordering to payments, diversified requirements of client requests concerning product personalization and lower prices, increased pressure of stakeholders for enterprise profitability have led, over the latest decades, to new directions of academic research and practical actions. These may be grouped under the common heading "Supply chain engineering and management" (SCEM). This domain has been steadily and rapidly got the interest of both academia people and industry managers and knowledge workers. This book is meant to make a balanced review of several standard well established methods together with a survey of new research results in modeling aspects (e.g. "stochastic dynamic pricing"), advanced technologies (e.g. "radio frequency identification - RFID), manufacturing organization paradigms (e.g. "reconfigurable manufacturing systems - RMS").

The authors of the book, Prof. Alexander Dolgui and Prof. Jean-Marie Proth, are well-known scientists in the domain of manufacturing engineering, management and control. Prof. Alexander Dolgui is the Director of the Centre for Industrial Engineering and Computer Science at the "École des Mines" of Saint Étienne (France). His main scientific interests and research results are in the usage of exact mathematical programming and their combination with heuristics and meta-heuristic applied to manufacturing line design, production planning and supply chain optimization. Prof. Jean Marie Proth has been the Research

Director at the National Institute for Computer Science and Automation (INRIA), leader of the "Simulation, Analysis and Management of Production Systems" (SAGEP) team and the Loraine research centre of INRIA.

His main scientific interests and research results are in the usage of Operational Research techniques and Petri nets applied to production, management, and scheduling, facility layout and supply chains. It is worth mentioning both authors have been closely collaborating with companies from several industries including steel-making plants, automotive production, microelectronics and so on. Consequently, they have been able to test in practical applications the usefulness and usability of several methods and technologies. The result is a book which is meant to provide the reader with some of the most applicable and effective solutions.

The book chapters address, in parallel presentations, various aspects of supply chain engineering and management. In each chapter, the terminology is explained first, then the well established results reported in the literature are reviewed to "set the stage" for presentation of new results. In most cases the presentation of methods and technologies is illustrated with real-life examples

The first two chapters address the *pricing* issues including the strategies for oligopoly markets and the detailed description of several variants of the dynamic pricing approach.

The *outsourcing* issue, which is more than once overlooked in the literature on production management, is addressed in the third chapter. The Chinese experience and the possible "harmful" consequences of outsourcing make this chapter a very interesting one.

The *inventory management* subject is addressed in chapter 4 and several well established and effective methods and control strategies are presented.

The *RFID* ("Radi -Frequency Identification") technology basic notions and applications in various industrial sectors are presented in chapter 5 together with expert opinions, economic evaluation and privacy concerns.

Various *manufacturing organizations paradigms* such as FMS (“Flexible Manufacturing Systems”), AMS (“Agile Manufacturing Systems”), LMS (“Lean Manufacturing Systems”), and RMS (Reconfigurable Manufacturing Systems”) are surveyed in chapter 6.

Chapters 7 and 8 present methods for *manufacturing line balancing* in the deterministic and stochastic operating time case, respectively.

Chapter 9 describes *dynamic scheduling and real-time assignment* methods including the new “repair-based approach”, which combines the static scheduling with the real-time corrections for the case of unexpected events.

The new trends in *manufacturing layout and warehouse management* and design are presented in chapters 10 and 11, respectively.

The book contains five appendices which describe several *combinatorial optimization* methods, such as a) simulated annealing; b) branch and bound , c)dynamic programming;

d) tabu search; e) genetic algorithms. In each case, the basic underlying idea, the detailed algorithms, and various examples are given.

The editing and printing quality of the book are to be appreciated.

This reviewer thinks the book, which is written by the right authors, came at the right time to help the managers and other knowledge workers of the industrial organisations to become familiar with useful, usable and utilized methodologies and technologies which can contribute to improving the performance of the enterprise. At the same time, the work can be viewed as pointer to a very promising research direction for the academia people and researchers from system and industrial engineering areas. Consultants and software companies may also get new inspiring ideas from this book.

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