

Manufacturing Management

Principles and Concepts

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In the authors' intention, the book is an introduction into modern manufacturing management. It mainly aims at identifying and presenting the fundamental concepts and principles underlying new approaches and methods (such as "lean manufacturing", "shelf engineering", "just-in-time", "total quality management", "kanaban", "kaizen", etc.).

The book is organized in four parts.

Part one ("Core Concepts") includes two chapters. **Chapter 1 ("Dynamics of Industrial Competition")** discusses several fundamental issues, such as the model of industry structure of Porter, the value chain, generic competitive strategies ("overall cost leadership", "differentiation" and "focus"), various possible competitive positions and the market structures, the relationship between industry dynamics and manufacturing in an attempt to pigeonhole the manufacturing business in a general competitive environment. **Chapter 2 ("The Concept of Added Value")** defines value-adding, presents quality and waste problems and describes some new and important concepts and techniques ("value engineering" and "quality function deployment""shelf engineering", "lean manufacturing", design for manufacturing) to account for the necessity that product design, which is "the root of value-adding process", should at once consider client demands and the manufacturing process co-ordinates.

Part two covers six chapters, and deals with specific manufacturing management aspects. The dynamics of the flow of materials through a manufacturing plant is the crux of the matter of **Chapter 3**, which defines the role of inventory buffers, says about manufacturing bottlenecks and refers the corresponding generic types of manufacturing plants ("V, A and T plants"). Several forecasting techniques on the product market demand together with the classical and new results in strategic production planning and master production scheduling are presented and illustrated in **Chapter 4**. This chapter mentions, for the first time in this book, IT support (Section 4.6). **Chapter 5** focusses on a central policy in manufacturing resource

planning (MRP) and thoroughly applies it by means of numerical examples. An introduction in the "closed loop" MRP (MRP 2) follows. An alternative to batch manufacturing planning, namely the proprietary "optimised production technology" together with its extension to a more general "theory of constraints or synchronous manufacturing", is described in **Chapter 6**. **Chapter 7** is specially devoted to the principles of the celebrated Japanese "Just-in-time" (JiT) approach for both original repetitive production environment and the batch manufacturing environment and to some associated methods such as the "Kanaban" system group technology. **Chapter 8** addresses the maintenance function, which is to become an essential part in manufacturing (rather than an auxiliary one as of now). Condition monitoring and TPM (Total Productive Maintenance) are described.

Part three also includes two **Chapters (9 and 10)** and is concerned with the input and output ends of the manufacturing flow. A discussion on the purchasing function opens up this Section. Then the distribution function is viewed in correlation with the "logistics management", a modern concept reflected in a total view of the flow of materials and goods. Here comes in the use of IT for anticipating some issues in the fast growing domain of "telecommerce".

Part four ("Global issues") is the final one and includes **Chapters 11 through 13**. "Total quality" and "kaizen" concepts, manufacturing strategy design and implementation and manufacturing performance monitoring, are referred. Several modern techniques and tools are presented, in order to persuade managers in considering, adopting and exploiting Japanese concepts and practical results in Western way of manufacturing. The future will surely indicate which is the most appropriate approach to the Western manufacturing: the one recommended in this work, or the more disruptive (or "highly innovative") one, based on "business process reengineering" as Hammer and Champy (together or separately) plead for.

The importance of the book can be threefold motivated. This is one of the rare books that take a total system view at manufacturing business in the context of a competitive environment. Apparently, the authors do not overlook anything related with the manufacturing management. The authors succeed in a balanced presentation of current issues (such as lot sizing demand forecast, MRP, etc.) as well as of new promising solutions, mostly coming from Japanese enterprises. Even though the book is mainly concerned with discrete part manufacturing problems, the above concepts application to continuous processes or to other industries, is several times remembered.

The book style is most remarkable. It is clear, not far-fetched, and, even neat. Examples are well-chosen and stimulating. The terms, concepts and main ideas on various approaches are systematised, even though some benefit a more detailed presentation than others, and mathematical results and notations are not sufficiently explained.

The reader is invited to find his own way in the terminological "jungle" of modern manufacturing, by taking this book as a valuable guide. It not only explains concepts and principles, but also puts them into correlation. The book does not only supply information but also bring in structure and helps the reader in building up an almost complete body of primary knowledge.

This reviewer considers the book an important one (that is why this review is published in a

journal which normally addresses IT field only) given the place the authors see for IT in manufacturing management, namely an "enabling tool" assisting the solving of well-defined problems. IT professionals are often prone to considering IT as the centre of the universe, or to adopting a rather "Procrustian" way of solving various problems, as allowed by the existing or newly devised IT tools or products. The book is expected to urge them not to learn new algorithms or system architectures or other IT related problems but to look at the manufacturing management problems from a different and broader perspective. In addition new trends such as "telecommerce", "extended enterprises", IiM ("Integration is Manufacturing") which the world of computer and control engineers in the USA and Europe is largely interested in, will be better understood.

In conclusion, this reviewer looks upon the book as an essential reading for both skilled managers in the manufacturing field, who wish to learn new methods, and students in manufacturing business and industrial engineering. As said before, the book is a valuable source of complementary information for system analysts and students in systems engineering and applied informatics.

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