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BOOK REVIEW

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Abstract:

Book review: "Introduction to Manufacturing: An Industrial Engineering and Management Perspective" by Michel Baudin and Torbjorn Netland (2023) Routledge. ISBN 9780815363194

JEL classification: M11

If there is something not missing, it is textbooks on lean manufacturing and operations management. An increasing number of textbooks are written every year, and many successful ones go in ever new editions. This book could be one of these successful ones. It provides a different, practical perspective to manufacturing that makes the topic more accessible to students than most academic books. It also makes it accessible to practicing managers that want to have a more comprehensive and structured overview on manufacturing. Instead of providing students (and managers) with a long list of different textbooks and manager-oriented literature, this book combines both perspectives into a comprehensive vade mecum.

The book follows a logical structure. It first introduces manufacturing. It then focuses on the actual design of the manufacturing system. Then it focuses on its operationalization, first in terms of information flow and then in terms of material flow. Once this is set up, the final part focuses on improving of the system.

In the first three chapters, summarized as getting to know manufacturing, manufacturing is defined as operations that transform material to distinguish it from other operations. The focus of the book is on the management of these operations. This means the focus of the book is largely on the production management part of "Manufacturing". This also aligns with the background of the authors. The history of manufacturing is mapped, and its importance highlighted before strategic aspects and demand characteristics, including forecasting, are discussed.

The next four chapters, summarized as engineering the factory, start by outlining different process designs. This aspect is one of the most important in manufacturing since it largely determines all succeeding decisions. This is well reflected in the book. The next chapter then focusses on aspects specific to assembly, before attention turns to a returning buzzword of the industry 4.0 era - automation. This book sees automation as a design decision rather than introducing technological solutions, which in our view is definitively a plus. It also highlights the importance of humans, which links well into the new paradigm of Industry 5.0. The last chapter of this engineering, the factory part, focuses on layout decisions, leading to the questions of flow.

Making information flow is the objective of the part containing the next three chapters. The first chapter focusses on the creation of the actual data and control infrastructure. This aspect becomes ever more important in today's data driven manufacturing environments, and most textbooks do not address the problem of how to actually create, store, and retrieve data. While the book does not shy away from technical terms, it does not become too technical to make it hard to read for the target audience either. Production planning and control is then introduced with a strong emphasizes on classical systems. Kanban is introduced in-depth, but many readers may find it hard to understand MRP logic after reading this chapter. The last chapter of this part focusses on master data management; this is essentially the database underlying production planning and control etc. This structure is quite unfortunate, and many readers may prefer to switch chapters letting the data creation chapter be followed by the database chapter and then the actual applications, e.g., production planning and control.

Making materials flow is the next part, consisting of four chapters that cover the classical production management topics: internal logistics, external logistics, warehouse management and supply chain management. Internal logistics goes back to pull systems, introducing essential concepts such as water spiders

and supermarkets. External logistics focusses on 'classical' logistics topics. Both internal and external logistics focus on work-in-process inventory and supply, while warehouse management focusses on finished goods inventory. Supply Chain management focusses on inter-company aspects. There are a lot of practical examples, which makes these topics easily accessible to students and managers.

The last part of the book is about actual performance improvement. It highlights the point that one must first set up the system (part 2 and part 3) before one can start improving (part 4). The first chapter focuses on measurement, which is essential for any performance improvements. Combined with control actions, this allows to manage performance. The actual improvement is described in the second chapter of this part, which focusses on continuous improvement and kaizen. Specific means to improve quality and to ensure appropriate maintenance are introduced and discussed in the final two chapters.

The book is well written and easily accessible to the average reader. In a world where most students are intrigued by the potential of social media and e-commerce, rather than good old manufacturing, it provides a fresh new look. But it also has some downsides. First, the quantity of concepts referenced is astonishing and probably everything a production manager of the 2020s should know is covered. But how does it all hang together? There is a red line missing, and the subdivision of chapters is often not clear. For example: Why are Kanban, pull and milk run in three different chapters? Why are measurement and data separated? The book ends quite abruptly and sometimes it reads more like an encyclopedia. But it is here that the lecturer fits in. Each lecturer has its own perspective on how things connect in a system and which concepts should or should not be emphasized. The book allows a good lecturer to emphasize elements and to weave elements together in a coherent story. A less experienced lecturer may find this difficult. Second, some technical aspects are missing. The book is essentially equation free. This makes it an excellent book for an introduction (for what it was written), but it apparently needs support by more technical books at later stages of the curriculum.

In general, I really enjoyed reading the book and can definitively recommend it. It puts an end the times where one needed to run around with a heap of books to cover all important aspects of today's manufacturing, thus outgrowing the topics of classical text and lean books. The complexity of manufacturing is likely to increase further, which requires us to take a broader perspective to manufacturing. This book provides such a perspective, and hence offers students and managers the means to stay competitive in an ever more challenging world.

About the Author

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Matthias Thürer is Chair of Factory Planning and Intralogistics at Chemnitz University of Technology (Germany). He contributed to the improvement, simplification and integration of material flow control systems, and their integration with Industry 4.0. Apart from Operations Management, Matthias is also interested in social and philosophical issues including system theory, cybernetics, causality, and philosophy of science.