

# Preface

Industrial production has always been a propulsion element in any economy, be it from a perspective of value-creation, employment potential, or its impact on sustainability and technological innovation; the ability to manage operations and supply chain is therefore a key skill for a company's competitiveness.

If this has always been true, today as never before, in a world hit hard by a medical emergency first, and then by economic and social ones, the reflection on the most appropriate management practices in manufacturing has become a central element for individual companies, entire sectors and countries.

New manufacturing strategies more oriented toward flexibility, agility and resilience have replaced traditional paradigms and choices oriented toward efficiency, pursued through outsourcing and offshoring in countries far from the assembly plants and their markets, sourcing policies based on very few suppliers, lean approaches and reduction of the working capital invested in inventories, planning systems based on optimization criteria and sell-in in channels crowded by the proliferation of product ranges. In this new landscape shaped by the recent medical and economic crisis the most appropriate manufacturing foot-prints and supply chains are those redesigned on the basis of local-for-local principles, quickly reconfigurable, characterized by multiple suppliers, compensation flows among warehouses and distribution centers to offer product availability where needed, insourcing decisions aimed at saturating production capacities and re-internalized skills, choices favoring agile practices, revision of end-to-end planning systems fueled by sell-out dynamics, focalization on products, channels and clients based on priorities linked to the necessity of insuring business continuity, cash-to-cash cycles control, creation of buffers justified by the volatility and uncertainty of the markets.

In summary, from an approach that, at best, protected itself from probabilistic events with risk management measures, to one aware of the need to put crisis management processes in place, aimed at preventing and reducing the impact of unforeseeable events.

In this context, deep reflection aimed at analyzing which production models to choose and how to redesign the value-creation chains has begun inside single production units and entire supply chains. The ability to analyze the need of change in the operations and, consequently, to select and implement appropriate choices, can only be based on robust approaches of analysis and diagnosis of manufacturing systems, the measurement of the current and prospective performance, and the knowledge of the foundations and principles of Operations and Supply Chain Management.

This work has therefore the objective of collecting and systematizing what has been developed through research and didactic production by the group of scholars who for more than 20 years have been collaborating on the topic of Operations and Supply Chain Management. In addition to integrating into a single perspective what has been developed and, at times, published by the authors of this volume, it is intended to collect here the scientific production traceable to three streams of contributions in the field of Operations and Supply Chain Management:

- the main works published at international level that represented and continue to form the foundational reference for this field;
- the works of Italian Authors who placed the topic of Operations Management in the studies conducted in our country;
- the most recent productions by a few colleagues with whom we share the commitment to focus on and teach Operations and Supply Chain Management.

In trying to provide the reader with a useful key to understanding its content, the work is written from the perspective of those who – be it a young student, a master participant, a manager or entrepreneur – are interested in approaching the main methods and practices of Operations and Supply Chain Management in order to start processes of analysis, diagnosis and improvement of company's performance. In accordance with the objectives set, the text is characterized by a managerial point of view, accompanied by multiple quantitative insights and examples of application of the main tools and algorithms illustrated.

This volume offers an extensive coverage of the issues discussed, selected based on the programs of Operations and Supply Chain Management taught in Management and Engineering faculties, ranging from the basics of the field to the most recent approaches and solutions, among which it is worthwhile mentioning the following:

- Analysis of production systems
- Operations and supply chain strategy decision making
- Performance measurement
- Problem setting and solving in the operations management
- Production planning and inventory control
- Production Scheduling, Just in Time and Theory of Constraints
- Lean management
- Procurement and vendor management
- Supply chain management
- Operations data management and Information systems
- Digital manufacturing and Industry 4.0.

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