



## **SUPPLY CHAIN MANAGEMENT**

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### **MOTIVATION**

The Management function of Manufacturing, Operations or Production, refer to the same discipline within the firm. It basically consists of understanding the responsibilities associated with the productive unit of an organization and its interface with the other functional areas such as Finance and Marketing. In the last decade a large number of companies have begun to dominate specific global markets through the superior capabilities of their production and operations system, i.e., better quality and service with a low cost, while maintaining a high degree of flexibility to respond to changes.

The 1980's have changed the role of the manufacturing and operations function as a key component in a firm's competitive strategy. Companies in different industries (e.g., automobiles, electronics, home appliances, etc.) have witnessed a decline in market share as a result of their inability to compete with other (foreign) competitors on the basis of product design, cost, service, and/or quality. Financial measures are a very informative way of capturing performance but they are not enough! It is also important to include operational measures that capture the way in which the "manufacturing/operations mission" is being accomplished. It is well recognized that high performance in product design, manufacturing, engineering, and distribution are essential for competitive success. Hence, a basic set of operational performance objectives should be explicitly incorporated for the overall evaluation of the company. These can be summarized in four dimensions: cost (i.e., purchasing, production, distribution, productivity), quality (i.e., product), service (i.e., internal to the company and external to consumers), and flexibility (i.e., volume, product, process).

The global environment is forcing companies to integrate the rest of the world within the scope of their competitive strategy. They cannot isolate themselves from external factors such as economic trends, the competitive situation or the status of technology. At the same time, companies cannot isolate the decision process of different functional areas. Every organization has to be analyzed as a system in which the different functional areas (e.g., marketing, operations, finance) as well as the different members (e.g., suppliers, manufacturers, retailers) are all inter-related. Understanding the relationship among the various areas will enhance the effectiveness (doing the right things) and efficiency (doing

the things right) for reaching the strategies set by top management. Recent research in operations strategy has focused attention on the strategic role that operations can play in improving the competitive capabilities of the firm.

We refer to the Operations Manager as the person in charge of the production process and the related support functions. S/he has to plan, organize and control the activities related to the production function throughout the whole cycle from buying the raw material to the distribution of final goods.

## **OBJECTIVES**

This course is directed at providing a comprehensive introduction to the fundamental decisions and tradeoffs associated with the Strategic Planning and Control of a firm's Operation function. It focuses on four goals; (1) to provide an overview of the relevant issues in Operations Management (Supply Chain Management and Service Operations Management); (2) to present some of the approaches, methods and standard tools used to address these issues; (3) to develop an appreciation for the interaction of Operations Management with other management functions in the organization; and (4) to develop an understanding of the field as a whole. We intend to show that Operations Management rather than being only an aggregation of tools, is instead a consistent sets of concepts, approaches and management techniques, which relate directly to, and enhance the management of, production systems.

## **ORGANIZATION OF THE COURSE**

The course is organized in three major sections: (1) Basics of Operations management, (2) Planning the System and Management and (3) Control of Operations. We start by considering corporate strategic planning and its relationship to the operations function. It is followed by an introduction to the major types of production processes to be found in industry identifying the distinguishing characteristics and competitive positioning of each process. The course then moves on to tactical level issues for the management of operations. The topics covered include: operations strategy, product and process design, aggregate production planning, capacity planning, master scheduling, MRP, just in time (JIT), distribution logistics and inventory control, quality control and productivity.

## **TEXTBOOKS**

*Fundamentals of Operations Management*, N. J. Aquilano, R. D. Chase, M. M. Davis, *Irwin*, 1995 (available in the library)

*Production and Operations Analysis*, Steven Nahmias, *Irwin*, 3<sup>rd</sup> edition (available in the library)

*Designing and Managing the Supply Chain : Concepts, Strategies, and Cases*, David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi, McGraw-Hill

*Supply Chain Management: Strategy, Planning and Operation*, Sunil Chopra and Peter Meindl, *Prentice Hall*, 2001.

*Management Industriel et Logistique*, G. Baglin, O. Bruel, A Garreau, M. Greif, Ch. van Delft, 3<sup>rd</sup> edition, *Economica*, 2001 (available in the library)

Please note that we will not follow any of these books precisely. They are thus only recommended as supporting material.

## **COURSE OUTLINE**

### **General Introduction to Operations Management**

- Presentation of the course
- Introduction to operations management
- Product structure
- Production processes and supply chain
- Make to order vs make to stock
- Notion of service level

### **Operations Basics**

- Functionalities of inventory
- Cost of inventory
- Performance measures
- Relationships between flows, inventories and delays
- Capacity analysis

### **Decisions and Informations**

- Decisions in operations management
- Hierarchical approach to operations management
- Importance of information
- Information and decision systems

## **Planning**

- Reasons for planning
- Ways of balancing load and capacity
- Relevant costs
- Sales and operations plan
- Basic models for planning

## **Material Flow Management**

- General issues in material flow management
- Various information on demand
- Master production schedule (MPS)
- Different approaches to material flow management

## **Inventory management**

- Introduction to inventory management
- The EOQ model
- Continuous vs. periodic review
- Basic inventory management techniques
- Notion of safety stock
- ABC analysis

## **Material Requirements Planning (MRP)**

- Principle of Material Requirements Planning (MRP)
- Safety lead time and safety stocks
- Lot sizing
- Capacity Requirements Planning (CRP)

## **Distribution Logistics Management**

- Issues in distribution logistics management
- Distribution network design
- Material flow management in distribution
- VMI and CPFR

## **Just In Time**

- Just-in-time approach
- Quality management
- Total productive management
- The SMED technique
- Layout redesign

## **Supply chain strategy**

- Issues in supply chain design
- Outsourcing
- Supply chain collaboration

## **Service Operations Management**

- Introduction to service operations management
- Different types of service activities
- From product operations management to service operations management
- Call centers
- Issues in operations management of call centers