Chapter 1. Supply Chain Focused Manufacturing Planning and Control

1. Summary

This chapter focuses on introducing the basic concept of a manufacturing planning and control system (MP&CS). A manufacturing planning and control system (MP&CS) has the objective of ensuring that the desired products are manufactured at the right time in the right quantities and are meeting quality specifications in the most cost-efficient manner. In the 1970s, the push manufacturing concept dominated MP&CS thinking. Decades after the 1970s, other concepts regarding MP&CS were introduced such as the lean philosophy, adaptive manufacturing, and flexible manufacturing. This chapter and book focuses on manufacturing planning and control system (MP&CS) in the context of supply chain and supply chain management. It introduces the MP&C framework which emphasizes the integration of the activities involved with the delivery of the product to the customer.

The manufacturing planning and control (MP&C) framework is composed of manufacturing planning, and control activities at strategic, tactical, operational levels emphasizing the integration of decision making and information flows between the different levels. The manufacturing planning and control (MP&C) framework is designed to create a highly integrated value chain linking the suppliers, manufacturer, and the customers. This value chain is driven by the customers. In this value chain, exists close relationships between the suppliers and manufacturer have who share the gains among the member of the chain equitably.

While newer manufacturing practices have been introduced, the MP&C framework does not require the old practices to be fully supplanted. Rather, the blending of the current and past manufacturing with a focus on integration is encouraged to increase the value of the supply chain without sacrificing the interests of the ultimate customer and supplying organizations.

1. Chapter Outline

* The Global Trends in the Manufacturing’s Competitive Environment and MP&CS
* The Manufacturing Planning and Control (MP&C) Framework
* Manufacturer–Supplier Relationship Types
  + *Arms-length transactional relationship*
  + *Strategic relationship*
* Relationship Quality
* Historical Perspective of Manufacturing Planning and Control Systems
  + *Push Manufacturing*
  + *Lean (Pull) Manufacturing*
  + *Flexible Manufacturing*
  + *Adaptive Manufacturing*
* Different Manufacturing Environments
  + *Make to stock (MTS)*
  + *Make to order (MTO)*
  + *Assemble to order (ATO)*
  + *Engineering to order (ETO)*

1. Suggested Teaching Strategy

As the introductory chapter, the emphasis should be on explaining the basic concepts and describing the manufacturing environments in which these concepts are put into use. This would include going over the history of manufacturing control in detail with some interesting historical anecdotes. The details regarding the various systems are covered in the later chapters. Thus, only brief introductions for these would be sufficient. On the other hand, the more emphasis should be put on explaining the different manufacturing environments as these concepts will be used as the foundations of many of the later episodes.

1. Solutions to Discussion Questions
2. *Write a brief memo to your immediate manager discussing why the study of supply chain–focused manufacturing planning and control is important in today’s competitive manufacturing environment.*

To: Mr. Rogers

From: Bob Miller

Title: Memo about supply chain–focused manufacturing planning and control

The importance of implementing a competitive supply chain–focused manufacturing planning and control has become important to the company’s bottom line because of the changes in our company’s competitive environment and internal operation practices.

*In regard to competitive environment:*

The average lifecycle of our flagship product category has been reduced by 15% over the last 5 years. Moreover, the demand patterns have become increasing difficult to forecast as a result of increased variability. The product variety demanded by the ultimate customer has also increased.

The consequences on operations are the need to decrease manufacturing lead time and increase manufacturing flexibility.

*In regard to internal operational policies:*

Compared to 10 years ago, the fabrication value added by internal manufacturing has decreased to 40%~60% while the portion of the end production value attributed to the value-added components and assemblies purchased have increased to 40%~60%. Thus, it has become more important to manage the quality delivered by the supply chain and coordinate the material flow along the supply chain.

The manufacturing planning and control system (MP&CS) has the objective of ensuring that the desired products are manufactured at the right time in the right quantities and are meeting quality specifications in the most cost-efficient manner. In the position of our company, the study and implementation of an efficient supply chain–focused manufacturing planning and control system is essential for our company to gain a competitive advantage in our competitive market.

*Difficulty Level: Moderate*

1. *Discuss the relationship between the manufacturing planning and control system and the supply chain.*

The manufacturing planning and control system determines the flow of material through the value adding activities to make the product. The current trend is having a significant amount of the end product’s value composed of components and sub-assemblies manufactured externally along the supply chain. The performance of the supply chain has become an important driver of competitive advantage in the market place. Thus, the manufacturing planning and control system is required to extend beyond the internal boundaries of the company towards the suppliers along the supply chain. The current MP&C framework’s emphasis on integration and information sharing are the result of this situation.

For this purpose, the manufacturing planning and control system requires building and managing relationships with the suppliers along the supply chain beyond the traditional arm’s length relationships commonly employed by manufactures. Rather than having an adversarial relationship in which the parties try to increase one’s profit at the expense of others along the supply chain, important relationships are encouraged to take a win-win attitude. The parties share information and integrate planning and control to maximize the overall supply chain profitability and the gains are distributed equitably along the supply chain.

*Difficulty Level: Easy*