Master Production Scheduling: An Overview

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Abstract

The process of production planning is central to the success of any manufacturing company. In general terms, the production planning process involves generating a plan to satisfy customers in a manner that results in a reasonable profit. The specifics of the production plan should vary company to company, and industry to industry.

In this paper, authors have highlighted the aspects of master production scheduling. A technique used in material requirements planning systems, to develop a detailed plan for product manufacturing. The master production schedule, compiled by a master scheduler, takes account of the requirements of various departments, including sales (delivery dates), finance (inventory minimization), and manufacturing (minimization of setup times), and it schedules production and the purchasing of materials within the capacity of and resources available to the production system

Key word: Production, Production System, Production Scheduling, Manufacturing

Introduction

Production Scheduling is the process of generating "to-do" lists or dispatch lists for the shop floor. As part of a larger planning and scheduling process, production scheduling is essential for the proper functioning of a manufacturing enterprise.

Typically, staff generate dispatch lists for key production resources, be they machine, tooling, or labor. The lists consist of operations sorted in start date order. Sometimes, schedules show start and finish times, calculated based on estimated set up and run times for operations and the available time of the resource. The goal of the process is for the shop floor to operate in the most efficient manner possible, while still satisfying the timing of customer requirements.

The production scheduling process [1] can over-emphasize efficiency at the expense of customer satisfaction, or customer satisfaction at the expense of efficiency. Therefore, the best production schedules are generated as shown in Fig. 1, not by shop floor staff, who are measured on efficiency, or customer service staff, who are measured by on-time delivery, but by a third group within operations that receives input from both the shop floor and from customer service. The production scheduling are grouped in four divisions
i.e. 1. Marketing, 2. Engineering, 3. Manufacturing and 4. Sales / Services.

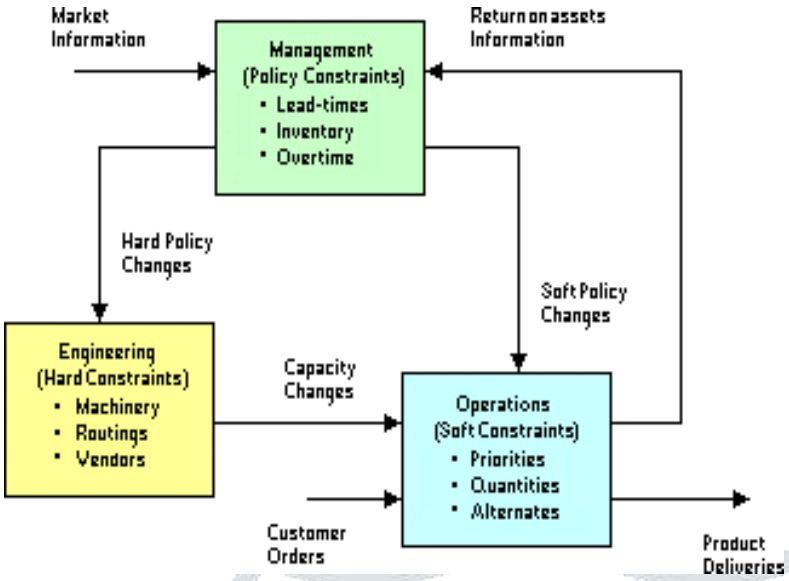

Fig. 1: Master Production Scheduling

I. Production Planning

The process of production planning [2] as shown in Fig.2 is central to the success of any manufacturing company. In general terms, the production planning process involves generating a plan to satisfy customers in a manner that results in a reasonable profit. The specifics of the production plan should vary company to company, and industry to industry.

Depending on the type of business and the similarities among items, you may want to aggregate demand into product families and use generic product bills of material and routings when production planning. In deep bill of material environments, you may also want to do Master Production Scheduling. In deep bill environments, you should explode bills as part of the production planning process. Although it can be done manually, historically, this bill of material explosion has been handled by the MRP (material requirements planning) module of the company's business.

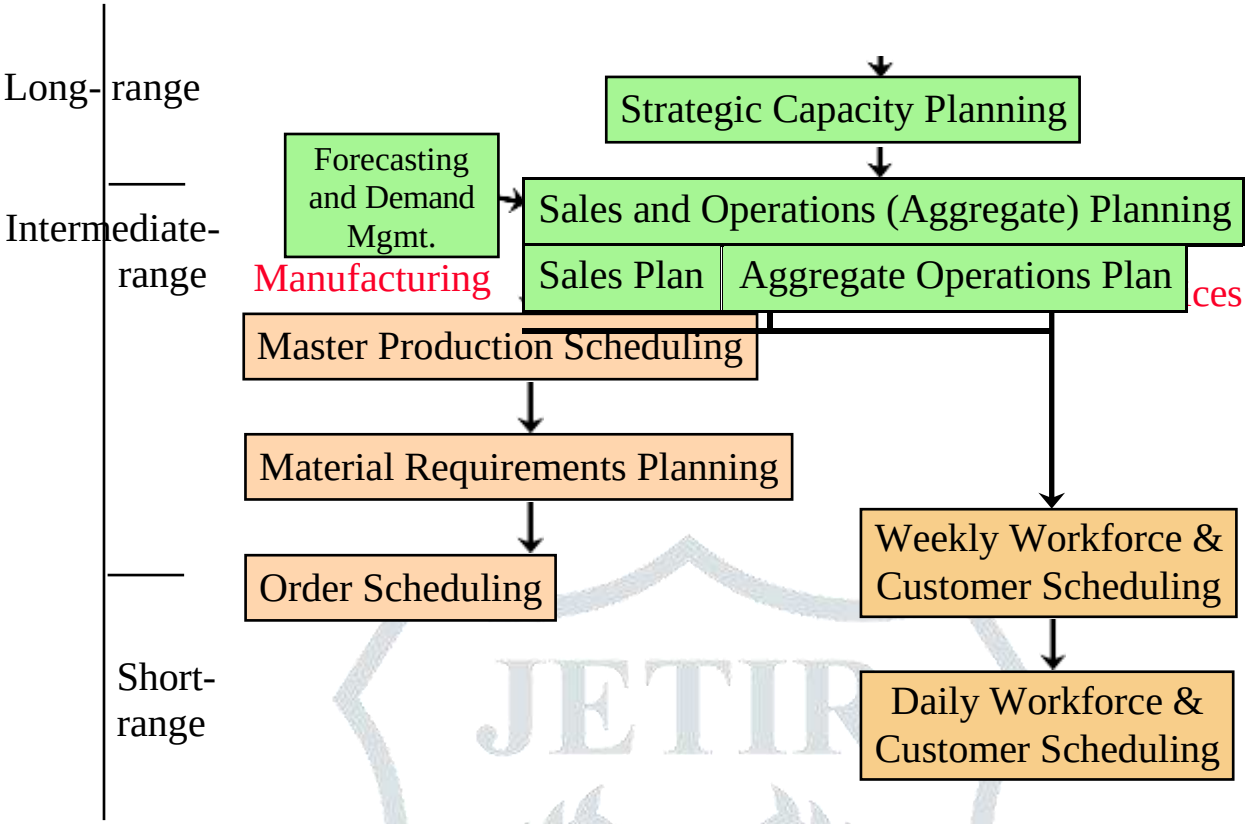

Fig.2: Different Phases of Process Planning

II. Computerized Production Scheduling

Production scheduling can be a time consuming, tedious task. As work is completed, as new orders are introduced, and as other changes (e.g. machine breakdowns) occur, the schedule needs to be modified and / or regenerated. Prior to the computer age, staff scheduled by hand using pad and paper or with magnetic wall boards.

By their very nature, spreadsheet approaches are limited in their modeling capability. Without robust modeling capability, scheduling software loses its ability to accurately predict when operations will finish. Modern, commercially available Finite Capacity Scheduling software and Advanced Planning and Scheduling software give users the ability to create detailed models of capacity. When capacity is accurately modeled, schedules that accurately predict operation start and finish times over any time continuum can be easily generated. Just as importantly, the capacity models can be used as a what-if tool to aid in the decision making process.

III. Capacity Planning

The process of identifying resources necessary to support the production planning process[3] historically has been called Capacity Planning. Depending upon the time frame involved and whether or not bills have been exploded, more specific terms used to describe the process include resource requirements planning, rough-cut capacity

Capacity planning is the process of identifying necessary resources to support a production plan or a production schedule as shown in Fig.4. Depending upon the time frame involved and whether or not bills have been exploded, more specific terms used to describe the process include resource requirements planning, rough-cut capacity planning, or capacity requirements planning.

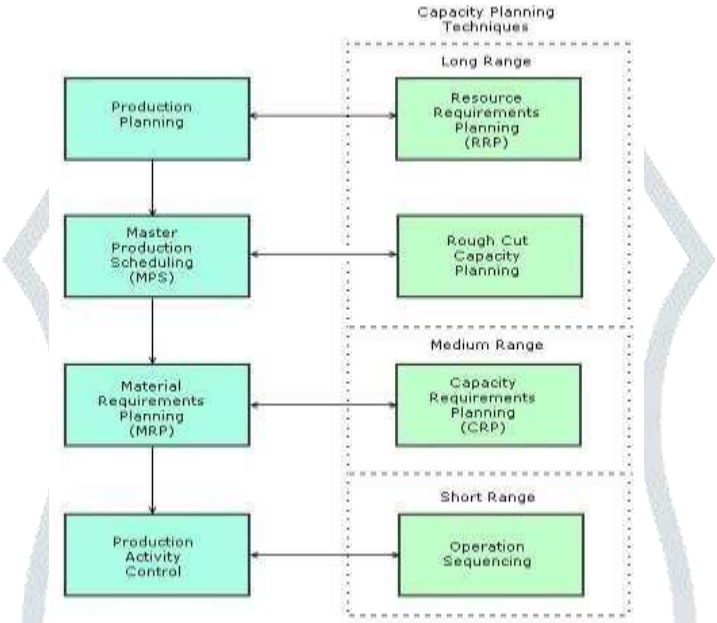

Fig.4 : Capacity Planning Technique

Conclusion

The Master Production Schedule (MPS) is used by many in manufacturing project management to provide a larger measure of foresight, representing the successful synergy between human initiative and the vast computational power of the microchip.

Advanced master Production Scheduling software can be of significant benefit in production environments where there are more than two levels in bills of material. All manufacturing environments will benefit from a good master production schedule. However, to attain maximum benefit, different environments require different approaches. One such environment is the proper monitoring the Job Shop. Job Shop scheduling is a special case of production scheduling. Job shop scheduling environments are characterized

Given the importance of on time delivery, often job shop customers want continual updating from you on when work is projected to finish. Finally, if work looks like it is going to slip, you need to be able to know what actions to take to get completion dates back on schedule. Job shop scheduling software that makes use of advanced planning and scheduling technology will provide all of these capabilities.

References

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