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EFFECTIVENESS OF MPC SYSTEM IN INDUSTRY

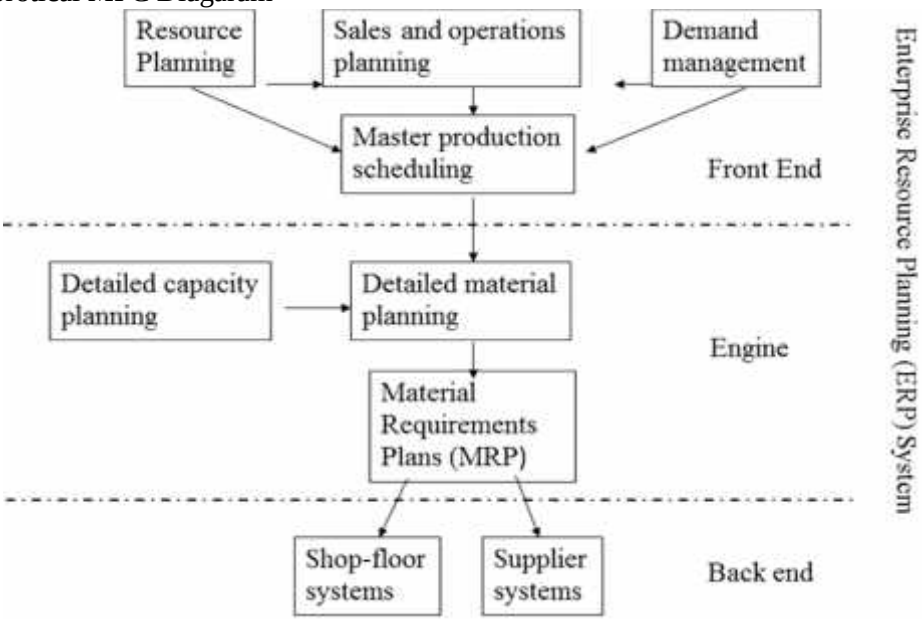
Mahesh M. Bhagwat, Harshad V. Ukarde, Aniket S, Chindarkar,
Hrishikesh M. Gangan, Akashata U. Jadhav, Omkar R. Gavand
Department of Mechanical Engineering, Rajendra Mane College of Engineering and Technology, Ratnagiri

Abstract
Various activities are supported by manufacturing planning and Control like material planning, purchasing, raw materials, inventory control, capacity planning, scheduling machines and people, WIP inventory control, coordinate customer orders, finished goods inventory control.
Manufacturing planning and Control facilitates in various ways like optimum utilization of capacity, inventory control, ensures quality and economy in manufacturing time.Manufacturing planning is accompanied with control mechanisms to ensure desired results. Results are compared with plans, if any deviations are found the revision of plan is done. Hence manufacturing control is an adjusting process, providing corrective measures for plan development. The manufacturing planning and control (MPC) system is concerned with planning and controlling all aspects of manufacturing, including managing materials, scheduling machines and people, and coordinating suppliers and key customers. Because these activities change over time and respond differently to different markets and company strategies. We believe that the development of an effective manufacturing planning and control system is key to the success of any goods producing company. Moreover, truly effective MPC systems coordinate supply chains joint efforts across company boundaries. Finally, MPC systems design is not a one-time effort; MPC systems need to continuously adapt and respond to changes in the company environment, strategy, customer requirements, particular problems, and new supply chain opportunities.

Keywords/Index Terms: MPC, ERP, Supply Chain, Materials, Effective Manufacturing Planning etc.

Introduction

Figure 1.1 Theorotical MPC Diagaram



(MPC, Thomas E. Vollman.)

It is most typical to find the MPC system imbedded in an Enterprise Resource Planning (ERP) system. Above Fig. is a schematic of the general MPC system that would be use within a firm for planning and controlling its manufacturing operation. The model shows in fig. is essentially what one will find as a key part of any package of ERP system the fig. is divided into three part or phases.

Phase 1:- Frond end

This phase establishes the overall company direction for manufacturing planning and control. Demand management encompasses forecasting customer end product demand, order entry, order promising, accommodating interplant and intercompany demand, and spare part requirements. Sales and operation planning balances sales plans with available production resources. The master production schedule (MPS) is the disaggregated version of sales and operation plans. That is it states which end items or product options manufacturing will built in future. Resource planning determines the capacity necessary to produce required products now and in the future.

Phase 2:- Engine

It encompasses the set of MPC system for detailed material and capacity planning. The master production schedule feeds directly into detailed material planning module. Material resource planning determines period by period plans for all component parts and raw material required to produce all the products in the MPS. This material plan can thereafter be utilised in the detailed capacity planning systems to compute labour or machine centre capacity required to manufacture all component parts.

Phase 3:- Back End

In back end system configuration depends on products manufactured production process employed. The supplier system provide detailed information to company supplier

The initial cost for material planning and control system can be substantial, moreover the ongoing operational cost are also sufficient.

Objectives of Study

To know, how the Manufacturing Planning and Control contributes to the efficient use of facilities and equipments.

1. To study the effect of Manufacturing Planning and Control on production function.
2. To understand the effect of new orders on Master Production Schedule. And actual implementation of new Master Production Schedule on shop floor.
3. To know whether Manufacturing Planning and Control practices reduce waste and increase profit.
4. To locate the inefficiencies in the present Manufacturing Planning and Control system and implement the suggestion if possible.

3. Case Study of Medical Equipment Industry

We have performed a case study on Adler industry and compare theoretical MPC system and actual MPC system used in a company in order to found out inefficiencies and to improve the productivity of company.

Adler MediequipPvt. Ltd. Is a part of the Sushrut-Adler group of companies.Adler Mediequip was setup in the year 1993 with the initial objective of bringing to the Indian orthopaedic medical devices that meet world standards.

Adler was 1st India manufacturer in the field of orthopaedic medical devices to secure the ISO 9002: 1994 certifications in year 1999. Adler upgraded to the ISO 9001: 2000 certification in 2002 and quickly followed up by obtaining the coveted CE certification in 2003 for various product families, another Indian 1st in 2006, Adler was once again the 1st Indian manufacturer in the field to be certified ISO 13485:2003 complaint. Adler's QMS has been upgraded and certified in JUNE 2009 as per ISO9001:2008. Adler is the 1st Indian manufacturer of orthopaedic Implants to get manufacturing license issued from Central License Approving Authority of Government of India.

4. Actual Working MPC System in Industry

By comparing theoretical MPC system with actual one we found that MPC system used in company is somewhat similar to diagram shown below. And by detailed study each of the department with respect to theoretical MPC system we find out some inefficiency.

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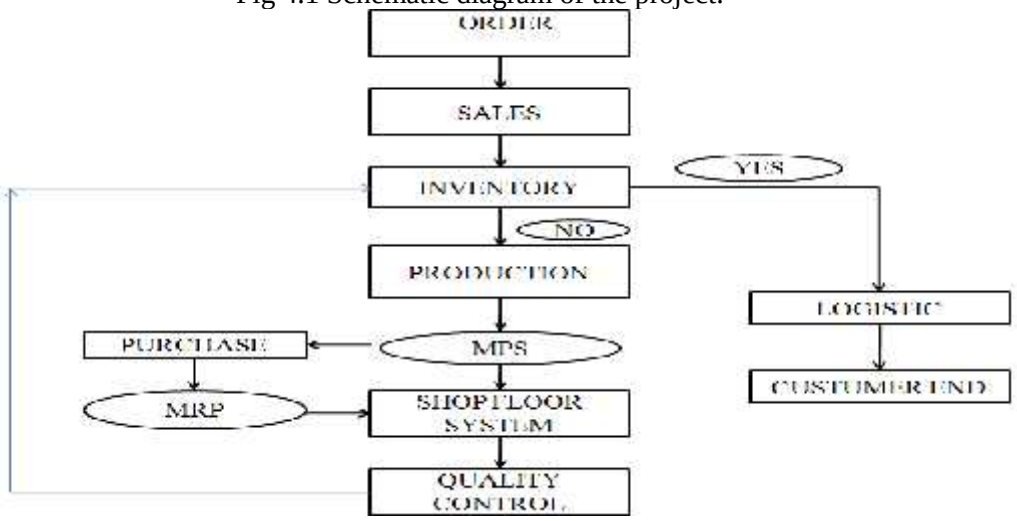
Fig 4.1 Schematic diagram of the project.

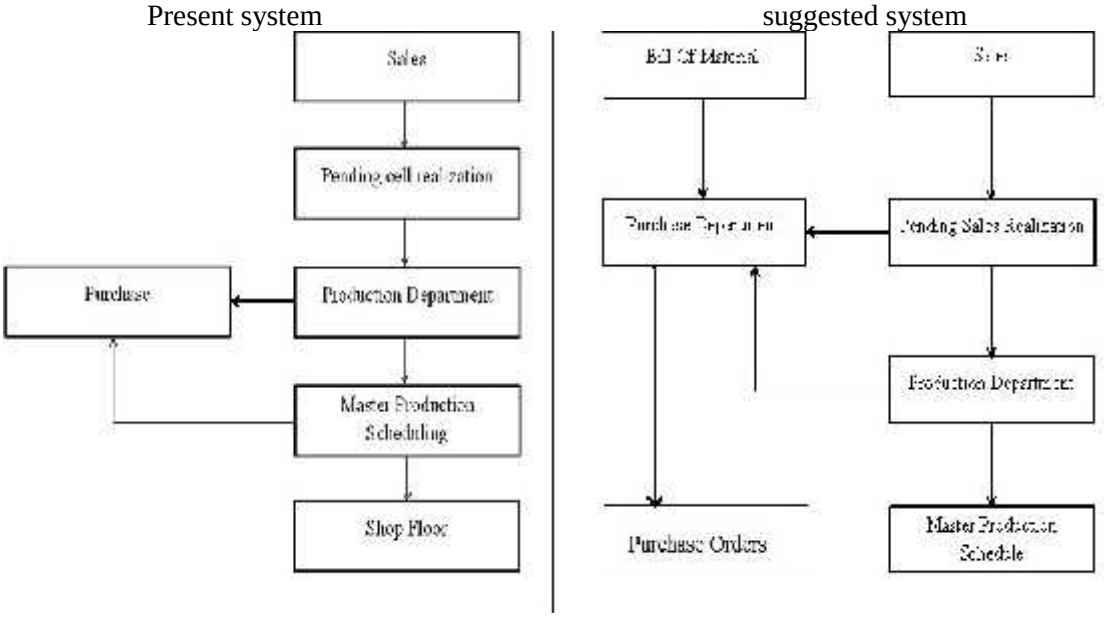


5. Limitations of Traditional MPC System

The main limitations of traditional MPC are:

5.1 Time Lag Between Sales and Purchase Department is Major Disadvantage of Traditional MPC Which can be Eliminated.

Figure 6.1

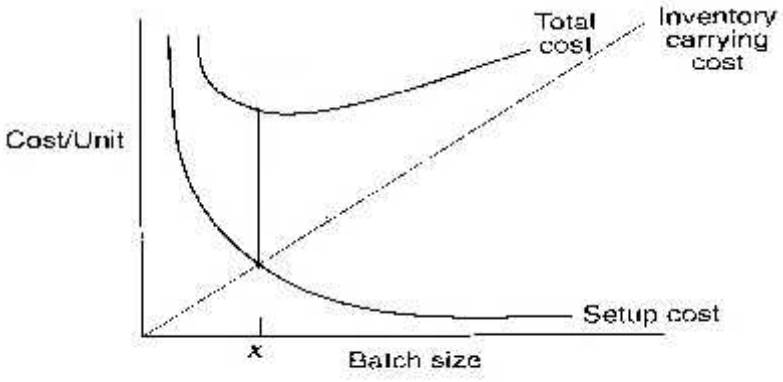


This improvement can be done only for non movable raw materials to reduce lead time. As there is no stock of non movable raw material, so purchase order of that material is given when that material is required for production. So it requires somewhat more time.

This time can be reduce, if access of Pending cell realization report and Bill of material is given to Purchase Manager, So it is possible to understand the requirement of non movable raw material and can release purchase order quickly. So it reduces processing time for giving purchase order as purchase manager can place order before requisition of raw material from production department.
By using this, time lag between Sales department and Purchase department is minimized.

5.2 Implementation of Economic Batch Size can increase the productivity of company.

Figure 6.2 Economic Batch Size



(Industrial Engineering and Production Management, Martand Telsang.)

The batch sizes are selected as per the pending orders. This is suitable for non-movable products. But there are some products which are continuously required. For such product, industry kept some stock. For such product batch size should be such that inventory keeping cost and set up cost should be minimum.

As large batch quantity will result in high stock level and cause a large amount of capital to be tied up. The higher level of stock will incurs other costs such as inventory or stock keeping, insurance, depreciation etc.

On the other hand, too small batch size will result in insufficient stock level to meet fluctuation in demand and frequently processing of small batches incurring set up costs each time.

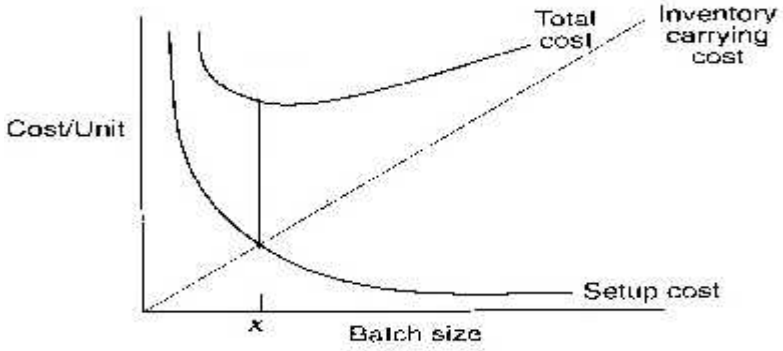
5.3 Time of purchasing can be reduced by Giving Reordering Notification through ERP Software Directly.

In industries, when level of any raw material falls below minimum level, storekeeper manually give notification to purchase manager about it by using bin card. This is manual process and sometimes there is a chance of human error.

This can be done automatically as in Enterprise biz software as it has all data about raw material quantity. Just we have to enter data about minimum level of each raw material and some changes have to make in software program to give notification about minimum level.

5.4 Implementation of Proper EOQ Model Reduces Inventory Carrying Cost in MPC.

Figure 5.3 EOQ



(Industrial Engineering and Production Management, Martand Telsang.)

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On the other hand, too small batch size will result in insufficient stock level to meet fluctuation in demand and frequently processing of small batches incurring set up costs each time. Hence EOQ is beneficial.

5.5 Earliest Due Date

In industry, for sequencing job on machines first in first out (FIFO) rule is followed. As Adler manufactures medical equipments which are related to human health it will be better from social point of view that sequencing should be done by Earliest Due Date rule. In this rule preference is given to the customer who needs earlier delivery.

According to earliest due date rule, jobs are sequenced in the order of non-decreasing due dates. This rule minimizes the maximum job lateness as well as maximum job tardiness.

6. Conclusion

If the given suggestion is effectively implemented in industry then the efficiency of MPC system can be improved which results in reduction in inventory, reduction in waiting time and efficient utilization of resources thus contributing to increase the profitability of company.

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