

Recent Trends in Production Planning and Control

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Abstract— The paper examines the present state of Production Planning and Control (PPC), defines some of the technical and system modifications that have happened in recent years, and connections them to market-placed demands for businesses. PPC is requested to react to inner and external modifications efficiently by being more vibrant and offering stronger resource command and delivery performance. Some of the demands are recognized to be met by the fresh PPC schemes. To satisfy these demands, it is suggested that there is a need for greater knowledge of how distinct variables impact the efficiency of PPC structures and that administrative structures need to improve. PPC's financial, administrative and behavioral elements are discussed.

Keywords— Production Planning and Control (PPC), Factors affecting PPC, Functions Of PPC, Progress in PPC

I. INTRODUCTION

Production planning and controlling anxious to implement the plans, i.e. detailed job forecasting, assignment of workloads to machines and individuals responsible for that job, as well as the actual workflow through the system. PPC is often regarded as a system of assembly operation [1]. This role seeks to make economical use of human assets, people and equipment in any department by scheduling, organizing and managing manufacturing operations that transform the raw material into finished goods or components as the most important strategy. All manufacturing or production cycle operations should be scheduled, coordinated, structured and monitored to their objectives. In manufacturing organizations, PPC as a department plays a significant role. Planning is described as establishing objectives. PPC provides various agencies with completely distinct types of data. It offers the marketing department with data on accessible manufacturing assets. Department of Sales gets a return in accordance with this data. It also contacts with various agencies and offers appropriate data.

Typically PPC processes are organized in hierarchical structures [2]. Effective buildings often give sub-units or manufacturing divisions some independence. The scheduling logic, which is inherent to most scheduling information systems, reinforces the PPC hierarchy. Typically, such logic breaks down top-level schedules, cascading them down to a rising amount of information. Categories planning levels as strategic, tactical and operational – a classification originally given by Anthony (1965). Strategic, where decisions are made that set overall operational goals, tactical, where resources and

production are planned in the medium term; operational, where production plans are put into action. Each level handles decisions that inform the next level below in the hierarchy. At strategic and tactical planning levels there may be a need for extensive interactions in making decisions, including negotiation between and across functions. Each of these functions may have distinctive roles, objectives, and ways of working. Planning may typically have to communicate with sales, procurement, logistics, finance, and manufacturing. The interplay between these tasks at the operational level is typically more action-based than planning-based. Such cross-functional devices were explored at distinct stages of the hierarchy in the studies described here.

II. OBJECTIVES OF PPC

- **Effective utilization of resources:** PPC consists of efficient use of funds, facility, and machinery, resulting in low-cost and strong organizational yields.
- **A steady flow of production:** PPC guarantees a constant and periodic manufacturing stream. All the machines are used for full use here. This consists of periodic manufacturing that helps to provide clients with a routine availability.
- **Estimate the resources:** PPC assists in estimating assets such as people, equipment, etc. The assessment is focused on the prediction of revenues. Production is therefore scheduled to satisfy marketing needs [3].
- **Ensures optimum inventory:** PPC provides an optimal inventory. It avoids overstocking and under-stocking, necessary reserves are kept. The raw material inventory is retained at the appropriate stage to satisfy the requirements of manufacturing. The inventory of finished goods is also retained to satisfy clients' periodic requirements.
- **Coordinates activities of departments:** PPC helps organize the various departments' operations.
- **Minimize wastage of raw materials:** It guarantees that the raw materials and products processing are properly stored. This enables minimize coarse product wastage. It also guarantees that value products or goods are manufactured. This leads to a minimum of rejections.
- **Improves labour productivity:** It increases the productivity of labour. There is full use of resources here. Workers are given training. In the manner of enhanced salaries and other benefits, the benefits are

distributed with the employees. Workers are encouraged to do the utmost they can. This leads to enhanced effectiveness of labour.

- **Helps to capture the market:** PPC helps deliver products to clients in a timely manner. This is due to the periodic performance manufacturing stream. So the business can efficiently experience rivalry and catch the industry.
- **Provides a better work environment:** PPC offers employees a stronger working setting. Workers are getting better working conditions, good working hours, leave and vacation, higher wages, and other incentives. The reason is that the industry works very effectively.
- **Facilitates quality improvement:** Facilitates the enhancement of performance: manufacturing scheduling promotes the enhancement of performance as manufacturing is frequently inspected. Employee awareness of value is created through instruction, recommendation systems, quality circles, etc.
- **Results in consumer satisfaction:** PPC helps to provide customers with a periodic availability of products and facilities at high rates. It outcomes in fulfilment of the customer.
- **Reduces the production costs:** allows optimum resource usage and minimizes waste. It also retains the optimum inventory volume. All of this decreases the cost of manufacturing.



Figure 1: Objective of Production Planning and Control [4]

III. FUNCTIONS OF PPC

The main functions of PPC are the coordination of all the activities, which exist during production or manufacturing

- **Materials:** When needed, raw and normal completed pieces and semi-finished goods must be accessible to guarantee that every manufacturing procedure begins on the moment.
- **Methods:** this feature is designed to evaluate the feasible production process and attempt to identify the optimum technique consistent with a specific collection of conditions and installations
- **Machines and Equipment:** The techniques of production must be linked to the manufacturing facilities accessible and the machinery replacement policy should be thoroughly studied. This role concerns the evaluation of the manufacturing plants, repair process, and machinery policies in detail.

- **Routing:** means the stream of an operating series and procedures to be pursued in order to produce a specific finished item. The procedure of production and its succession are determined.
- **Estimating:** This function is concerned with the estimation of operations time. The operation time can be worked Out once the overall method and sequence of operation is fixed and process sheet for each operation is available
- **Loading & Scheduling:** • This feature deals with operating period estimates. Loading & Scheduling is accessible for each procedure once the total operating technique and cycle are set and process sheets are accessible: it is essential that the device is charged according to its ability and efficiency. The preparation of loads and setting of start and closure schedules for a specific procedure.
- **Dispatching:** It involves assigning the job to various machinery or workplaces, involving the officials that begin manufacturing operations in accordance with their scheduled precedence.
- **Expediting:** it's also called progress or follow-up. Control the advancement of products and components by the manufacturing method. It is strongly linked to dispatching operations.
- **Inspection:** a significant instrument of inspection. Its assessment is important in the execution of the current program and planning stage of undertaking when the limitations of the processor, method, and manpower are known.
- **Evaluating:** The control function is an essential component. In order to evaluate previous knowledge with a view to enhancing the usage of methods and equipment, the evaluative feature provides a long-term feedback mechanism.

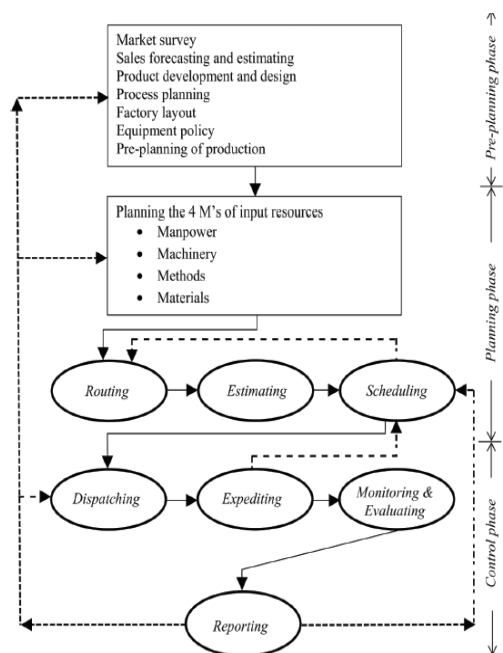


Figure 2: Block diagram for the function of PPC [5]

IV. FACTORS AFFECTING PPC

Some of the variables influencing PPC include the use of computers, seasonal variations, mode and design variants, test marketing, vertical vs horizontal integration, after-sales service, losses owing to frequent and unexpected variables, inventory production, design modifications, rejection, and substitution.

PPC schemes are made up of inputs, conversions, outputs, and suitable command structures. Traditionally, PPC has been difficult due to scheduling method constraints and unplanned shifts in demand, supply, and resources. Despite significant innovations in computer-aided PPC and a stronger knowledge of processes, they also discover it hard to manufacture products according to their plans.

The input (Demand);

- The required or selected output (Master Production Schedule)
- Chosen manufacturing schedules
- Supply scheme to guarantee that vendors deliver the right amounts of suitable value components, components, and equipment on a moment
- Conversion method, i.e. production system and how well it works
- Conversion process control (how to deviate from manufacturing)

V. CURRENT STATE OF PRACTICAL PPC

There is often a gap between PPC's theory and practice. Academics attempt to enhance knowledge of PPC structures by evaluating the shared effect of important PPC variables while professionals attempt to achieve useful outcomes from a combination of non-ideal software and ad-hoc handbook technologies. Practitioners often think that academics do not investigate the 'correct' issues and are affected by the ignorance of folly, while learners are often dissatisfied with the obvious absence of comprehension that executives of manufacturing command have direct ideas. As an illustration, when receiving instructions, professionals need to compromise on lead times so that they can cite shipping times and organize the accessibility of installation components. Usually selecting a shipping deadline is accomplished by assuming a fixed and deterministic lead time. This can be a fair estimate if the resource burden remains relatively continuous or relatively short. However, the concept of queuing obviously shows that extremely loaded resources generate lengthy and variable delays in the existence of supply and delivery, both subject to variation. Accordingly, actual lead times are a result of the load on the system along with random effects resulting from performance issues, machine, and process efficiency, supplies, individuals and demand. Rather, the specified lead times clearly influence the inventory, inventory amount, and the probability of timely delivery. Often, however, businesses embrace the contradictory approaches of variable loads concurrently while reducing the specified lead time. This may be one explanation of why there are many unrealistic plans [6].

VI. EVOLUTION IN PPC

In the view of the ever-changing globalization, customization and technology-led competition, the traditional production procedure needs to be shifted towards a fresh manufacturing paradigm. Prior to assembly, sophisticated technologies and tools and their operating methods in the scheme must be scheduled. Furthermore, the use of the ERP and APS systems in both PPC and MRP helps [7].

ERP: ERP includes the implementation in real time of sophisticated software and technologies to manage and integrate different key company process activities. In the layout, scheduling, manufacturing and quality control, ERP software integrates multiple apps to automate numerous technology, material, service, and human resources-related tasks.

APS: Any computer program using sophisticated mathematical algorithms or logic to optimize and/or simultaneously schedule finite capabilities, sourcing, equity plan, resource planning, forecasting, demand management and so forth. Simultaneously these methods take a series of limitations and guidelines into account to provide real-time plan development, scheduling, help for decisions, availability and capability to promise. APS often produces various situations and evaluates them.

MRP: This is the use of material planning software using a fact sheet and master production schedule to calculate the best quantity of material to store in order to ensure that production is not delayed. MRP systems ensure: that the raw materials are available for production at the right quantities and quality to ensure the products are delivered to consumers on time that safety material stocks are maintained in the store in order to prevent production delays, and those production activities are organized smoothly and in accordance with the delivery times.

IS: The implementation of IS helps in accurately acquiring data on various activities through information technology at distinct places. This may relate to the design, scheduling, production, economic and natural resources.

VII. CONCLUSION

PPC provides information to various departments with another type of data. It offers marketing dept with data on accessible production resources. According to that data, the marketing department gets instructions. Employment in production planning and control depends on education and experience. Working in PPC is a difficult job. Analytical skills are needed and the production method is understandable. PPC is important for the running of any company in the industry, as it can impact product quality.

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