

A Study on Production Planning and Control at Aditya Birla Group, Nagpur

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Abstract—Production Planning and Control (PPC) is an extremely critical role in manufacturing companies to guarantee the efficient use of resources, production flow, and production product delivery. In this paper, the attention is paid to the product analysis of the PPC system at Aditya Birla Group, Nagpur and specifically to the planning, scheduling, inventory management, and control mechanisms. The study is founded on both primary and secondary data sources based on a descriptive and analytical approach research. The analysis measures the effectiveness of production activities in terms of planning, monitoring and controlling to lead to operational efficiency. It also reviews how modern tools like Management Information System (MIS) help in the enhancement of decision-making and avoidance of deviation hindered production. The results suggest that good PPC system assists in minimisation of the operation costs, enhancement of the productivity, and quality sustenance of the products. The research finds that constant enhancement of the production systems, effective coordination, and embracement of advanced production technologies are critical in improving the overall performance.

Index Terms—Production Planning, Production Control, Inventory Management, Scheduling, Manufacturing Efficiency, PPC System, Operational Performance, Aditya Birla Group.

I. INTRODUCTION

The current competitive and dynamic business environment demands that manufacturing organizations should be efficient in production at the lowest cost and with high product quality. Production Planning and Control (PPC), is significant to the realization of these goals as it is the systematic planning, coordination, and control of the production activities. It serves as a liaison between the strategic

planning and actual manufacturing processes and it helps organizations to use their resources in an efficient manner and to satisfy their customers on time.

Production planning is the process of forecasting demand, setting up production capacity, and planning operations whereas production control is the process of maintaining the production process to the planned schedule and correcting any deviation in time. These functions collectively contribute to ensuring smooth flow of materials, less wastage, absence of delays and maximized use of manpower and machine.

Aditya Birla Group is a prime example of Indian multinational companies that has diversified interests in all aspects of business-like metals, cement, textiles and chemicals. It is a group that is reputed to be highly operational, innovative and quality oriented. Its manufacturing facilities such as Nagpur have the best production methods and management strategies that ensure high level of productivity and efficiency. The importance of the PPC is even greater in a large-scale company such as Aditya Birla Group because of the multifaceted nature of the work, a great amount of output, and the necessity to coordinate the work of different departments. Good PPC systems are useful in bringing production activities to the organization objective, lower management and enhancing customer satisfaction. This research paper seeks to examine Production Planning and Control system at Aditya Birla Group, Nagpur and determine its effectiveness in controlling production processes. The study aims at the interpretation of the planning approaches, the techniques of schedules, the management of inventory and the control systems applied in the organization. It further aims at finding out the difficulties within the current system and recommending what can be done to improve it. Generally, the research points to the

significance of PPC as the main contributor to the manufacturing performance and its role in the attainment of organizational success over the long run.

II. LITERATURE REVIEW

Production Planning and Control (PPC) is one of the vital functions of manufacturing systems that have been heavily researched and practiced by researchers and practitioners. It is concerned with planning, scheduling and controlling of production activities in order to ensure efficiency, cost effectiveness and on-time production of the products.

The early research on PPC focused on classical systems like Material Requirements Planning (MRP) that sought to handle the inventory and manufacturing schedules. Researchers however discovered that such systems were usually limited to deal with dynamic production environments and improved forms such as MRP II, Just-in-Time (JIT), and Optimized Production Technology (OPT) were developed.

In addition, the significance of marrying PPC and current manufacturing techniques was also emphasized in further work. PPC according to various studies acts as a determining factor as to what to produce, the quantity to produce as well as when to produce in response to the customer demand in an efficient manner.

Various PPC strategies that can be used in different industrial application have also been scrutinized by scholars. The most traditional methods used include Kanban, Theory of Constraints (TOC), and Manufacturing Resource Planning (MRP II), which are used extensively. Moreover, new strategies such as Workload Control (WLC), CONWIP and modern systems of supply chain integration have also been introduced to enhance flexibility and responsiveness in production systems.

The literature on the recent years is devoted to the effects of Industry 4.0 technologies on the PPC systems. The combination of technologies, including the Internet of Things (IoT), Artificial Intelligence (AI), and Big Data Analytics, has turned the conventional PPC into intelligent production systems. These systems also offer real time monitoring and enhanced visibility and better decision-making capacities resulting to improved manufacturing performance.

Furthermore, researchers demonstrate that

contemporary PPC systems add value to such key performance indicators as productivity, flexibility, quality and cost reduction. Another significance that has been highlighted by the researcher is the need to align the systems of PPC with organizational objectives and change them to meet shifting market demands.

III. RESEARCH METHODOLOGY

Research methodology is a scientific approach to a research problem. It gives the means and procedures to be applied in gathering, analyzing and interpreting the research-associated information. The current research work on Production Planning and Control within the Aditya Birla Group, Nagpur is founded on systematic and scientific method of attaining accuracy and reliability of findings.

3.1. Research Design

The methodology is a research study that exhibits a descriptive and analytical research design. The current Production Planning and Control (PPC) system is obtained by means of the descriptive approach and analyzed by employing the analytical approach to check its efficiency and define demand improvement strategies.

3.2. Nature of Data

The study has used both primary and secondary data:

Primary Data:

The information will be gathered as a result of informational interviews with the employees, observation of the production processes, and the practical experience on which the organization will be observed.

Secondary Data:

This will be gathered on official websites, research journals, books and past researches on the subject of PPC and in the form of company reports.

3.3. Data Collection Methods

- Observation method
- Informal interviews
- Documents and records of the company.
- Web-based academic materials and articles.

3.4. Sampling Technique

The sampling method employed in the study is that of convenience as the data will be collected according to the availability of access and easiness of information within the organization.

3.5. Sample Size

The production and management departments had a small number of employees that were considered in the collection of primary data because of time and access limitations.

3.6. Analysis Tools and Techniques.

The simple and efficient tools that have been used to analyze the collected data include:

- Percentage analysis
- Tabular representation
- Graphical (bar, pie charts)
- Comparison of performance (planned vs actual performance)

3.7. Objectives of the Study

- In order to investigate the Production Planning and Control system in the organization.
- In order to examine production scheduling and planning methods.
- To assess the inventory management practices.
- To establish the issues in the current system.
- To propose steps towards increasing efficiency.

3.8. Hypothesis Of the Study

H_0 (Null Hypothesis):

Production planning does not have a significant correlation with operational efficiency at Aditya Birla Group, Nagpur.

H_1 (Alternative Hypothesis):

Production planning is strongly associated with operational efficiency at Aditya Birla Group, Nagpur.

IV. OVERVIEW OF THE COMPANY

One of the well-known multinationals in India is Aditya Birla Group having large range of business ventures across the world and a solid business foundation. Since its establishment in 1857, the group has become a globally-known, organization with business in over 36 countries, which comprise the

metals sector, the cement sector, the textile sector, the chemicals sector and financial services sector.

The company has its base in the city of Mumbai, India and is credited with beliefs in operational excellence, innovation and sustainable operations. It has a workforce of more than 140,000 employees all over the world and counts millions of customers in the various industries. The Aditya Birla Group has always been concerned with the adoption of advanced technologies and modern management practices to increase its productivity and sustainable competitive advantage.

4.1 Business Segments

The business is in different major areas, which include:

- Metals: Aluminium and copper mining.
- Cement: Granted under Ultra Tech Cement, which is one of the largest manufacturers of cement in India.
- Textile: Manufacturing of branded garments and viscose staple fiber.
- Chemicals: Fertilizer and industrial chemical manufacturing.
- Financial Services: Insurance, asset management and lending services.

V. SCHEDULE CONTROL SYSTEM PRODUCTION PLANNING.

Production Planning and Control (PPC) is an important area of functioning of manufacturing companies that help organize an effective utilization of resources and facilitate production processes. The PPC system in Aditya Birla Group is technologically oriented, structured, and in line with the current industrial practice. It is also concerned with ensuring that the most productivity, the least wastage, and products delivery is done in time.

5.1 Production Planning

Production planning refers to the process of making decisions in advance on what to be produced, the quantity to be produced and when to produce it. The company has a systematic way of planning, it involves:

- Demand Forecasting: Figure relies on previous data, market trends and customer demands.
- Capacity Planning: Transportation of machines, labor and materials.
- Master Production Schedule (MPS): To prepare an

elaborate production plan at a given time.

- **Resource Allocation:** This is the optimal utilization of man power, machinery and materials. This assists in generating less uncertainty and enhancing production efficiency.

VI. DATA ANALYTICS AND RESULTS

Data analytics is an important part of the assessment of the Production Planning and Control (PPC) system effectiveness. It entails the gathering, classification, analysis as well as interpretation of data to assist in the decision-making and enhancement of performance in production.

The data analytics at Aditya Birla Group is also combined with PPC, with systems such as ERP and MIS, which will deliver real-time information about production and performance.

6.1 Data Analytics Theoretical Underpinning of PPC Data analysis.

The idea that data analytics in PPC rests on is the idea of data-driven decision-making in which historical data and real-time data are employed to streamline production processes.

Types of Analytics Used Descriptive Analytics

- Focuses on past data
- Sample: This is monthly production reports.

Diagnostic Analytics

- Determines problem causal factors.
- Scenario: Causes of delays during production.

Predictive Analytics

- Plans ahead what is needed in terms of demand and production.
- Example: Demand forecasting

Prescriptive Analytics

- Recommends the improvement measures.
- Maximization test: Ideal production schedule.

6.2 Data collection on analysis Data Sources of Data

- Production records
- Inventory reports
- Machine utilization logs
- Employee performance data

Table of sample data (Illustrative).

Month	Planned Production (Units)	Actual Production (Units)	Efficiency (%)
Jan	10,000	9,500	95%
Feb	12,000	11,400	95%
Mar	11,000	10,780	98%
Apr	13,000	12,350	95%
May	12,500	12,000	96%

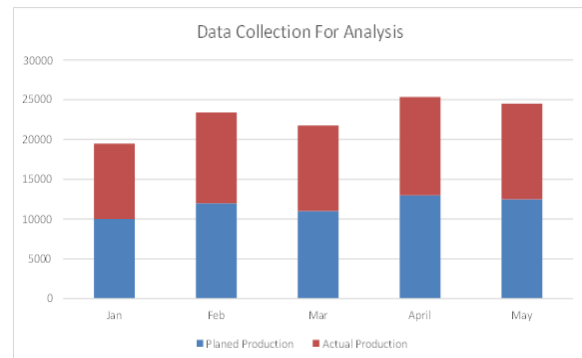


Fig 1 Data collection on analysis Data

VII. FINDING AND DISCUSSION FINDINGS

- The PPC system is organized and structured.
- The usage of advanced tools such as ERP and MIS is done successfully.
- Adequate scheduling eliminates wastage of time.
- There is effective inventory management.
- Good standards of quality are upheld.

VIII. DISCUSSION

The research study has revealed that a good PPC system is very critical in enhancing productivity and cutting down the cost of operation. Technology has been incorporated into the system making it more responsive and efficient. Production planning can however be affected by external factors like demand variations and supply chain disruptions in the processes.

IX. FUTURE SCOPE

- Application of Artificial Intelligence (AI) in planning production.
- IoT application in real-time monitoring of machines.

- Embracing Industry 4.0.
- Mechanization of the production operations.
- State of the art data analytics to enhance forecasting.

X. MANAGERIAL IMPLICATION

- Gives guidance to decision making by the helps managers.
- Enhances the planning and control of the production activities.
- Increases the cross-functional interrelation.
- Minimizes wastage and costs of operation.
- Enhances efficiency within the organization.
- Assists in long term strategic planning.

XI. LIMITATION OF THE STUDY

- Restricted accessibility to secret firm information.
- Research was limited to a single place (Nagpur unit).
- Limited time of research.
- The reliance on secondary data.
- Primary data is limited in sample size.

XII. CONCLUSION

The current Production Planning and Control (PPC) study within Aditya Birla Group, Nagpur is a significant issue when it comes to efficient and smooth production processes held by a powerful PPC system. The research shows that effective planning, scheduling and control of the activities involved in the production process goes a long way in the attainment of organizational goals like increased production, reduction of costs, and in-time product delivery.

The given analysis indicates that the organization has a properly constructed PPC framework with the assistance of the latest tools, such as ERP and MIS. These systems provide real-time tracking and coordination of various departments and make quick decisions. Data analytics also help in improving the efficiency of production processes by reducing deviations between the planned and the actual production.

It is seen also that effective inventory management, efficient use of machines and efficient planning of the work force are essential in enhancing overall performance of the operation. The emphasis of the company on quality control and constant improvement

provides consistency in the standards of the products and client satisfaction.

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