

A Study on Production Planning for Improved Operational Performance

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ABSTRACT

Production planning is important in manufacturing organizations because it helps coordinate manpower, machines, materials, inventory, production schedules, and production capacity. This study examines the role of production planning in improving operational efficiency at VB DACE Appliances Private Limited, a cookware and kitchenware manufacturer in Chennai, Tamil Nadu. The study focuses on resource utilization, inventory and material planning, production scheduling, and operational improvement. A descriptive research design was used, and primary data were collected from 50 employees in production-related functions through a structured questionnaire. The questionnaire included demographic information and 25 statements measured using a five-point Likert scale. Convenience sampling was used to select the respondents. The data were analyzed using SPSS through percentage analysis, descriptive statistics, reliability analysis, correlation, regression, and Chi-Square tests. The results show that employees have a positive view of production planning and operational improvement. The questionnaire showed high reliability with a Cronbach's Alpha value of 0.941. Operational Improvement had the highest mean score of 3.464. Resource Utilization had a strong positive relationship with Operational Improvement ($r = 0.730$), while Inventory and Material Planning also showed a strong relationship ($r = 0.722$). The regression results showed that the production planning factors explained 62.8% of the variation in Operational Improvement.

Keywords: Production Planning, Operational Efficiency, Resource Utilization, Inventory Management, Production Scheduling, Manufacturing, Operational Improvement, VB DACE Appliances

INTRODUCTION

Manufacturing organizations operate in a competitive environment where productivity, quality, cost, timely delivery, and proper use of resources are important for success. Production planning helps organizations coordinate these activities effectively. It determines what products should be produced, when they should be produced, and what materials, machines, workers, and production capacity are required. Proper planning helps reduce production delays, machine idle time, material shortages, excess inventory, and wastage. It also helps organizations meet customer requirements on time.

VB DACE Appliances Private Limited is a premium manufacturer of cookware and kitchenware in India. The company focuses on quality, innovation, durability, and customer satisfaction. Its production activities include purchasing raw materials, production planning, manufacturing, quality inspection, inventory management, and product dispatch. Effective coordination among these activities is necessary for smooth production. Therefore, production planning plays an important role in managing demand, material availability, production capacity, inventory, quality, and timely delivery.

III. RESEARCH METHODOLOGY

A. Research Design

The study adopted a **descriptive research design** to examine production planning practices and their role in improving operational efficiency at **VB DACE Appliances Private Limited, Chennai**. The design was selected to understand the existing production planning practices and employees' perceptions without manipulating the study variables.

B. Population and Sample

PRIMARY DATA

Primary data were collected directly from employees of VB DACE Appliances Private Limited using a structured questionnaire. The questionnaire was developed and administered through Google Forms to employees involved in production and related operational activities. The respondents included production managers, supervisors, machine operators, quality inspectors, planning executives, stores and inventory personnel, and maintenance technicians. A total of 50 valid responses were collected for the study.

The questionnaire consisted of 30 items. The first five items collected demographic information, including gender, age, designation, experience, and department. The remaining 25 statements measured key study dimensions, namely Production Planning, Resource Utilization, Inventory and Material Planning, Operational Improvement, and Overall Effectiveness. The statements were measured using a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

REVIEW OF LITERATURE:

Production planning is increasingly seen in recent literature as an integration of scheduling, capacity utilization, inventory management, technology and operational control.

In the paper, Kumar & Singh (2023) explored production scheduling and operational excellence in manufacturing industries. Their findings suggest that production scheduling contributes to effective workflow management, reducing the time period of lead time, increasing production flexibility, and enhancing the utilization of labour and machine capacity. These results are congruent with the importance of production scheduling as a major factor of operations' improvement.

Patel & Shah (2024) examined inventory management and production planning in manufacturing organizations. They found that maintaining optimal levels of inventories enables organizations to prevent shortage of material and excess of inventories and, thus, allows sustaining continuous production. Good inventory management was identified as an important factor of performance. These findings were also consistent with the current study, where Inventory and Material Planning showed a strong connection with Operational Improvement.

The study was conducted among employees involved in manufacturing and production-related activities. A total of **50 employees** participated in the study, including production managers, supervisors, machine operators, quality personnel, planning executives, stores and inventory staff, and maintenance personnel.

C. Sampling and Data Collection

A **convenience sampling technique** was employed based on the accessibility and willingness of respondents to participate. Primary data were collected using a structured questionnaire through **Google Forms**.

D. Research Instrument

The questionnaire consisted of **30 questions**, of which 5 covered demographic characteristics such as gender, age, designation, work experience, and department. The remaining 25 statements measured production planning and operational improvement using a **five-point Likert scale**, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

E. Data Analysis

The collected data were coded and analyzed using **Statistical Package for the Social Sciences (SPSS)**. The statistical techniques applied included **percentage analysis, descriptive statistics, reliability analysis, correlation analysis, regression analysis, and Chi-Square analysis**.

F. Study Focus

The study considers production planning as the systematic coordination of **manpower, machinery, materials, production capacity, inventory, and production schedules**. Effective production planning can reduce production delays, material shortages, machine idle time, wastage, and inventory-related problems while supporting timely order fulfillment. The study therefore examines production planning from an **operational efficiency perspective**, with particular emphasis on **resource utilization and inventory and material planning**.

DATA ANALYSIS AND INTERPRETATION

Reliability Analysis

The results of reliability analysis revealed that Cronbach's Alpha value obtained from the 25 items on Likert scale was 0.941. Similarly, the reliability of individual constructs ranged between 0.725 and 0.830. Hence, the test proved to be internally consistent.

Respondents' Characteristics

The number of the respondents was 50, where 68% of the respondents were male, and 32% were females. The biggest age range of the respondents was 18-30 years,

FINDINGS

- The study findings reveal that production planning is critical in ensuring smooth manufacturing operations.
- There is a generally positive perception regarding the production planning procedures used within the organization.
- Operational Improvement had the highest mean score of 3.464, revealing a positive perception regarding operational performance.
- The questionnaire was highly reliable since it had a high Cronbach's Alpha score of 0.941.
- There was a positive relationship between Production Planning and Operational Improvement with a correlation value of 0.606.
- Resource Utilization was strongly positively related to Operational Improvement with a correlation value of 0.730.

CONCLUSION

This research explored the association between production planning and operational efficiency at VB DACE Appliances Pvt. Ltd. The findings indicate that production planning is a critical element of the manufacturing process as long as it is complemented by effective resource and inventory/material planning.

The total validity of the measurement tool was very high with a Cronbach's Alpha value of 0.941. Descriptive statistics yielded positive perceptions from employees as Operational Improvement received the highest mean score of 3.464. Results of correlation analysis indicate positive associations between Production Planning, Resource Utilization, Inventory and Material Planning, and Operational Improvement.

REFERENCES

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which constitutes 46% of the total number of the respondents. Various roles and functions in organizations were reflected by the variety of respondents. The variety of the respondents is important for analysis because production planning includes many departments instead of one department only.

7.2 Reliability Test

The reliability test provided the Cronbach Alpha result of 0.941 for 25 items. This indicated that the questionnaire had good reliability in terms of internal consistency. The reliability test result for each construct ranged from 0.725 to 0.830.

Descriptive statistics of the constructs

Construct	Mean	Standard Deviation
Production Planning	3.280	0.862
Resource Utilization	3.276	0.916
Inventory and Material Planning	3.372	0.895
Operational Improvement	3.464	0.994
Overall Effectiveness	3.316	0.939

All the significant constructs had a mean greater than 3.00. The highest mean was recorded for Operational Improvement which stood at 3.464, followed by Inventory and Material Planning which stood at 3.

SUGGESTION

- Improved production schedule: The company can plan out their daily, weekly, and monthly production schedule considering their expected demand and capacity.
- Resource optimization: The resources of manpower, machinery, materials, and production capacity should be optimized, as the utilization of resources has a strong positive influence on the improvement in operations.

Inventory optimization: The inventory level should be checked to ensure that there is neither shortage nor excess of material