



## A Study on Production Planning Control System in Tenneco Automotive India Private Limited with Reference to Hosur

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### ABSTRACT

In the dynamic and competitive environment of the automotive industry, first-tier suppliers struggle to decrease costs, while improving delivery lead times and reliability and flexibility. In this research we present two aggregate production capacity planning models that optimize scheduling related production costs, for flow line assembly systems in the automotive sector; the distinction between permanent and contingent workers is made in the modelling. The IRS model is incorporated in a planning tool that is used for (sensitivity) analyses in a case study, at a first-tier automotive supplier. Results show that the master production scheduling can be improved, such that system costs decrease by approximately 9.6%. Besides the optimization of the production schedule, by means of the planning model, the planning model itself can be improved by adaptation of input parameters.

**KEYWORDS:** Automotive sector, planning model, production costs

### I. INTRODUCTION OF THE STUDY

**Definition:** Production planning is defined as the planning of production models in an organization or an industry. To serve different customers, it makes use of resource allocation of activities of employees, production capacity, and materials.

#### Types of Production Planning Advanced schedule and plan

Advanced planning and scheduling is the management process in which the production capacity and raw materials that are going to be used are allocated to meet the demand. This method is suited where the planning methods are simple and less complicated.

**Capacity Plan:** In this type of planning in which the required production capacity is determined by the organization and planned accordingly This

production capacity is such that it meets the changing demands of its products.

**Capacity = Number of machines or Workers \* no of shifts \* utilization \* efficiency**

### Scheduling

The process of controlling, arranging, and optimizing work as well as workloads in the process of production, is called programming. It is used to allocate machinery and manufacturing plant resources and also plan human resources and production processes. It is an essential tool for engineering and manufacturing, which has a significant impact on the process of productivity.

### OBJECTIVES AND BENEFITS

- Minimize costs / maximize profits
- Maximize customer service
- Minimize inventory investment
- Minimize changes in production rates
- Minimize changes in work-force levels
- Maximize the utilization of plant and equipment

### FUNCTIONS OF PRODUCTION SYSTEMS

- Production function encompasses the activities of procurement, allocation and utilization of resources.
- The main objective of production function is to produce the goods and services demanded by the customers in the most efficient and economical way.
- Therefore efficient management of the production function is of utmost importance in order to achieve this objective.

### NEED FOR THE STUDY

- Production planning and control manages and schedules the allocation of human



resources, raw materials, work centers, machinery, and production processes. It finds the most efficient way to produce finished goods with the lead times needed to meet production demand.

- Planning is required for day-to-day processes, like scheduling, dispatch inspection, quality assessment, inventory control, supply and equipment management. Control ensures that the execution of those items is done optimally, both in terms of cost savings and efficiency.

## II. STATEMENT OF PROBLEM

Making sure that production operations are started at planned places and planned times. Observing progress of the operations and recording it properly. Analyzing the recorded data with the plans and measuring the deviations. Taking immediate corrective actions to minimize the negative impact of deviations from the plans feeding back the recorded information to the planning section in order to improve future plans

## OBJECTIVES OF THE STUDY

### PRIMARY OBJECTIVES

To identify the production planning control in Tenneco Automotive India Private Limited

### SECONDARY OBJECTIVES

- To analyses the material requirement planning
- To know the actual Lot size and reducing Lot size based on the consumption
- To identify the receipts material as per collection plan
- To know the percentage of savings of operations

### SCOPE OF THE STUDY

Production planning determines the appropriate type and quality of inputs required for manufacturing. It also estimates the quantity and composition of inputs needed to achieve the desired level of output. Proper planning ensures effective coordination among workforce, machines, and equipment, reducing wastage and enabling smooth production flow. It helps maintain a continuous supply of raw materials, ensuring uninterrupted operations. Additionally, it promotes efficient utilization of resources, thereby minimizing overall production costs.

## LIMITATIONS OF THE STUDY

- Establishes production targets and monitors deviations using performance measures.
- Determines the optimal combination of input factors and coordinates resources efficiently across departments.
- Ensures production of the right product, in the right quantity and quality, at the right time.
- Schedules activities effectively while maintaining flexibility and minimizing overall production cost.

## III. REVIEW OF LITERATURE

**A.S.M.Raja, A.Arputharaj, SujataSaxena, P.G.Patil (2023)** Automobile wet processing, water is used mainly for three purposes, namely, as a solvent for dyes and chemicals, as a medium for transferring dyes and chemicals to washing and rinsing medium. Apart from the above processes, ion exchange, boiler, cooling water, steam drying, and the cleaning part of the process also consume a considerable amount of water. The amount of water used varies widely depending upon the type of processed, the type of product and the specific processes and equipment. Significant reductions in water use can be achieved by preventing unnecessary water consumption in automobile processing. Implementation of in-plant control techniques should be employed for achieving significant reductions in water use, raw material and energy consumption, wastewater production and, in some cases, even wastewater load.

**Kingsman (2024)** provided a theory for workload control in a mathematical form. The theory showed that attention should be concentrated on controlling the differences between the cumulative inputs and outputs over time, and not the period individual inputs and outputs, and Lead time management using input/ output workload based on the hierarchical control of workloads, are better than anticipated lead times.

**Huang e al.(2025)** developed a mathematical model for the workforce Production planning problem, where the uncertainty of the demand was handled by the safety stock concepts. It can be applied in a wide variety of aircrafts' components and it is known for its highly polluting dyes, short life-cycle and small concern with end of life. Combined with the aeronautic emissions, the automobile industry represents a clear threat to the environment, but it also represents opportunities. In order to promote sustainability in the completion industry, the product development process is of central importance. A



large number of general approaches and methods for the development of sustainable products has been proposed and used in the literature,

**Dellaert et al.(2025)** assumed that the Production shortage cost function to be either linear or quadratic with the amount of shortage, which corresponds to different market structures or different types of services. Compared to existing budgeting models, this paper explicitly considers a budget constraint. Under the assumption of a restricted budget, the objective was to minimize Production shortages. Numerical results showed that the quadratic cost function leads to smooth and moderate Production shortages over the time periods, whereas all shortages are either avoided or accepted when the cost function is linear. The Production planning system (PPS) presented here is dealing with the production planning and scheduling in the automobile industry.

#### Research Gap

The literature review shows that most studies focus on power cost minimization and logistics performance, with limited attention to overall production system performance. This research introduces a new model based on the existing organizational structure to enhance productivity. It highlights the importance of manufacturing planning and production control systems in the automobile industry. The study argues that factors like customer satisfaction and cost reduction cannot improve productivity without effective planning and control. Hence, an integrated production system approach is essential to overcome capacity planning issues and improve organizational performance.

#### IV. RESEARCH METHODOLOGY RESEARCH DESIGN

A research design is the basic frame work or plan for a study that guides the collection of data and analysis of the data in employee surveys this descriptive research design is adopted in data collection and analysis.

#### DESCRIPTIVE RESEARCH

Descriptive research can be explained as a statement of affairs as they are at present with the

researcher having no control over variable. Moreover, “descriptive research may be characterized as simply the attempt to determine, describe or identify what is, while analytical research attempts to establish why it is that way or how it came to be

#### SAMPLING METHOD

The sampling technique used in this study is “convenience sampling” when the population element for inclusion in the sample is based on the ease of access. It can be called as convenience

**SAMPLE SIZE:** It refers to the number of elements of the population to sample. The sample size targeting to chosen for the survey is 110.

#### POPULATION:

The size of the sample is always less than the total size of the population. In research, a population doesn't always refer to people. There are 162 up employees are there at Tenneco Automotive.

#### SAMPLING DESIGN

The sampling design being used for this study is convenient sampling size selected was 111 employees.

#### COLLECTION OF DATA

This research has used both primary and secondary for the study.

**PRIMARY DATA:** Primary data was collected through direct interaction with employees. The employees are interviewed by giving a questionnaire the filled in questionnaire leads to the collection of primary data.

**SECONDARY DATA:** Secondary data termed as reference data. The data is obtained form already existing information, information from the personnel department's reports, and welfare department company journals, yearbooks, website etc.

#### TOOLS USED

Collected data were arranged as per the tabulation, chart, and satisfied tools such as

1. Simple Percentage analysis
2. Chi-square test
3. Correlation
4. Anova



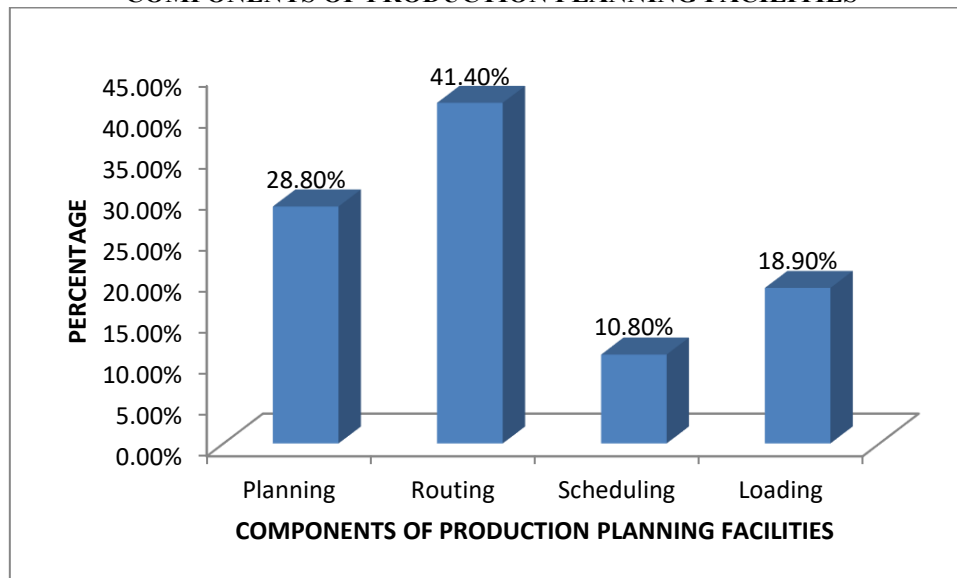
## V. DATA ANALYSIS AND INTERPRETATION

### COMPONENTS OF PRODUCTION PLANNING FACILITIES

COMPONENTS OF PRODUCTION PLANNING FACILITIES	RESPONDENTS	PERCENTAGE
Planning	32	28.8%
Routing	46	41.4%
Scheduling	12	10.8%
Loading	21	18.9%
<b>Total</b>	<b>111</b>	<b>100.0%</b>

Source: Primary Data

### COMPONENTS OF PRODUCTION PLANNING FACILITIES



### INFERENCE

The above table depicts that production planning facilities, 28.8% of the respondents are planning, 41.4% of the respondents are Routing, 10.8% of the respondents are Scheduling, and 18.9% of the respondents are loading

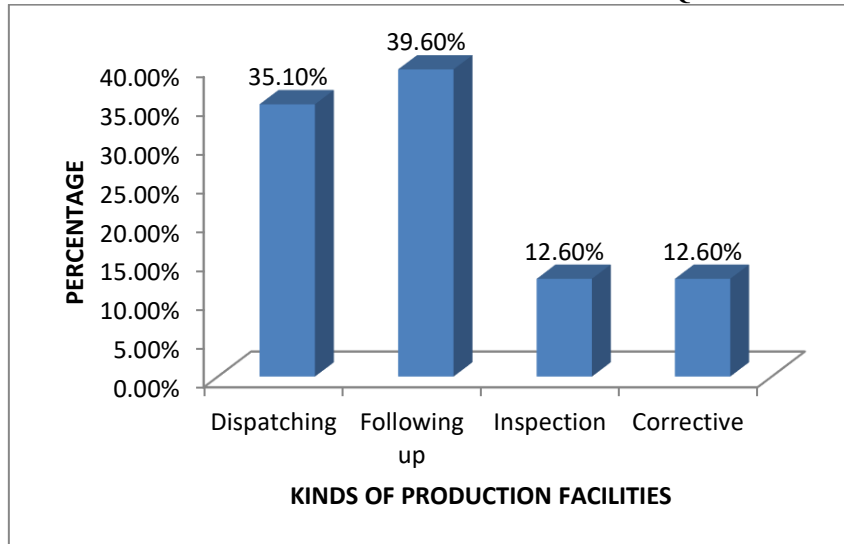
### KINDS OF PRODUCTION FACILITIES ARE REQUIRED

KINDS OF PRODUCTION FACILITIES	RESPONDENTS	PERCENTAGE
Dispatching	39	35.1%
Following up	44	39.6%
Inspection	14	12.6%
Corrective	14	12.6%
<b>Total</b>	<b>111</b>	<b>100.0%</b>

Source: Primary Data



**KINDS OF PRODUCTION FACILITIES ARE REQUIRED**



**INFERENCE**

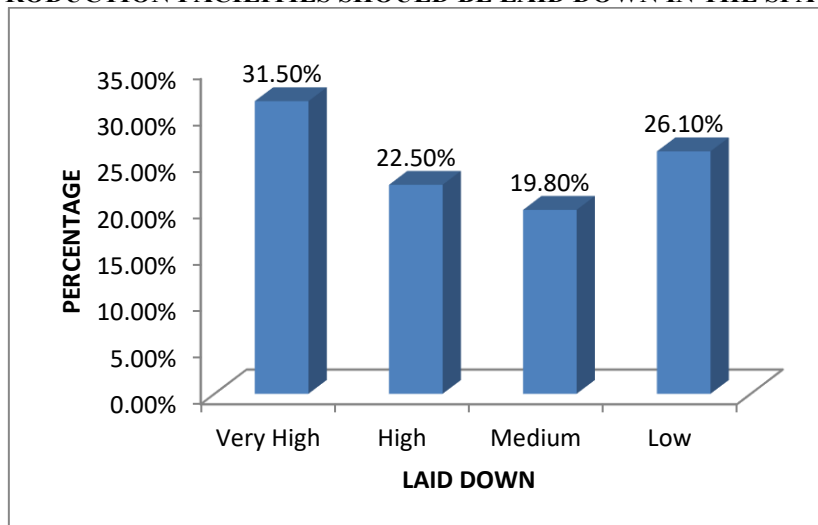
The above table depicts that production facilities are required, 35.5% of the respondents are dispatching, 40% of the respondents are following up, 1.7% of the respondents are Inspection, and 11.8% of the respondents are Corrective

**PRODUCTION FACILITIES SHOULD BE LAID DOWN IN THE SPACE**

LAID DOWN	RESPONDENTS	PERCENTAGE
Very High	35	31.5%
High	25	22.5%
Medium	22	19.8%
Low	29	26.1%
<b>Total</b>	<b>111</b>	<b>100.0%</b>

Source: Primary Data

**PRODUCTION FACILITIES SHOULD BE LAID DOWN IN THE SPACE**





**INFERENCE**

The above table depicts that, 31.5% of the respondents are Very High, 22.5% of the respondents are high, 19.8% of the respondents are medium, and 26.1% of the respondents are Low.

**CHI-SQUARE TESTS: POSITION IN THE COMPANY AND PRODUCE THE DESIRED PRODUCTS AT THE DESIRED RATE**  
**NULL HYPOTHESIS**

Ho – There in no significant relationship between Position in the company and Produce the desired products at the desired rate

**ALTERNATIVE HYPOTHESIS**

H<sub>1</sub> –There in a significant relationship between Position in the company and Produce the desired products at the desired rate

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.768E2 <sup>a</sup>	9	.000
Likelihood Ratio	169.880	9	.000
Linear-by-Linear Association	83.905	1	.000
N of Valid Cases	111		

a. 9 cells (56.3%) have expected count less than 5. The minimum expected count is 2.23.

**INFERENCE**

Since the calculated value is less than the table value. So we accept the null hypothesis. There is relationship between Position in the company and Produce the desired products at the desired rate

**CORRELATION**

**EXPERIENCE IN YEARS AND GOOD LAYOUT ALLOWS FLOW OF MATERIALS**

The table shows the analysis of the relationship between Experience in years and Good layout allows flow of materials

**Correlations**

		Experience in years	Good layout allows flow of materials
Experience in years	Pearson Correlation	1	.879**
	Sig. (2-tailed)		.000
	N	111	111
Good layout allows flow of materials	Pearson Correlation	.879**	1
	Sig. (2-tailed)	.000	
	N	111	111

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**INFERENCE**

Since the calculated value is greater than the table value. So we reject the null hypothesis. There is no significance between Experience in years and Good layout allows flow of materials



## VI. SUGGESTIONS AND RECOMMENDATION

1. Production planning ensures timely order fulfilment by managing stock levels, workstations, and scheduling activities effectively. It plays a key role in maintaining customer satisfaction and smooth workflow.
2. It helps in optimal utilization of resources through proper plans such as daily, monthly, or batch schedules, regardless of production scale. This improves efficiency and avoids resource underutilization.
3. Production planning supports raw material purchasing decisions and impacts inventory, cash flow, sales, and distribution. It ensures the right materials are available at the right time.
4. Production planning and control (PPC) together regulate and monitor the production system to achieve efficiency. They reduce wastage, improve organization, and lower overall production costs..

## VII. CONCLUSION

The study concludes that implementation of productive planning systems tool positively influenced the performance of Tenneco Automobile industries Pvt Ltd at Hosur. Manufacturing industries had implemented planning systems tool to a great extent. planning systems tool helped to optimize performance through customer service and that the firm had achieved significant cost saving, improvement in production efficiency and that Materials Management tool ensured that the right items are bought and made available to the manufacturing operations at the right time. The study concluded that implementation of production control positively influenced performance of automobile manufacturing industry in Hosur, further investments in inventory control tools would promote efficiencies in manufacturing industries and that inventory control tool ensured smooth production operations are achieved though maintenance of reasonable stocks of materials.

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