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A Study on Problems Encountered in Production Efficiency of Goods and Services in Automotive Industries in Chennai

Naresh R, Dr. Dhanalakshmi S

Final MBA (Operations and Marketing) student (full time), PG & School of Management studies, Sathyabama

Institution of science and Technology, Chennai (Sathyabama University), Tamil Nadu, India

Assistant professor, School of Management Studies, Sathyabama Institution of science and Technology, Chennai

(Sathyabama University), Tamil Nadu, India

ABSTRACT: During the manufacturing process, there are many production issues that can occur: poor quality, long lead times, high on-hand inventory, supply chain interruptions, etc. These things all affect the product you're putting out there, which in turn affects the public's perception of your brand. The most common problems tend to fit into four categories. These are Quality problems, Output problems, Cost problems, Management problems: Potential safety hazards. The objective of the study is to analyse problems encountered in production efficiency of goods and services in automotive industries in Chennai. The study based only on the opinion and expectation of employees. Total number of sample taken for the study is 110 respondents. Descriptive research design and Convenience sampling techniques were used for the study. Primary data and secondary data have been used in the study. Simple percentage analysis, chi square analysis and correlation analysis have been applied in this study to reach the finding of the study. It is found that there is positive relationship between age of the respondents and remedial measures to overcome the problems encountered in production efficiency. It is suggested that the system design must be well framed and plant layout must be well designed for production convenience and the production demands have to be scheduled properly. It must be met by the production department promptly. It is concluded that the top level management must contribute their resources and upgrade their infrastructure to obtain production efficiency. The company must offer frequent training for the employees to attain production efficiency.

KEYWORDS: Production efficiency, automotive industry, production planning, scheduling, resource allocation

I. INTRODUCTION

Production efficiency is an economic term describing a level at which an economy or entity can no longer produce additional amounts of a good without lowering the production level of another product. This happens when production is reportedly occurring along a production possibility frontier (PPF). Production efficiency is an economic concept that indicates the maximum level of output a manufacturer can produce without lowering the output of another product. Production efficiency may also be referred to as productive efficiency. Productive efficiency similarly means that an entity is operating at maximum capacity. Also referred to as productive efficiency, it's the level a manufacturer utilizes full production capacity. It also means that the manufacturer would need to lower the production of another product or drastically change the manufacturing process to produce more of a product beyond productive efficiency. To be clear, production efficiency assumes no change in the quality of the product. It's relatively easier to increase production and minimize costs when the company lower the quality of the product.

Production efficiency is the ratio between company's actual output and standard output, where standard output is the total units the company can produce utilizing the full capacity. To achieve production efficiency, company's actual output should equal the standard output. Company's workflows and internal processes are crucial to improving production efficiency. Standard operating procedures (SOPs) directly impact productivity and help maintain product quality across batches. The company can standardize almost every process in company's company. For instance, the company can standardize the process of bringing ready-to-ship goods into the warehouse, stacking them per purchase orders, and then handing them over for shipping. The company also can standardize the process of communicating



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these details to managers and workers. Efficient communication fills in information silos across departments and provides management the visibility it needs to improve a procedure's efficiency.

Equipment-related bottlenecks are easily noticeable when the company are striving for efficient production. In many cases, though, bottlenecks like equipment downtime are a result of inefficient maintenance procedures rather than anything else. A robust preventive maintenance program is key to minimizing equipment errors, consequently improving efficiency. The company also can analyze the equipment that consistently records backlogs in production. Investigate to find the bottlenecks causing the backlog and create work orders to resolve those issues. Of course, other potential bottlenecks can result from supply chain issues, unplanned downtime, or poor parts inventory management. For instance, company's vendor might significantly delay one of company's deliveries, causing the production to grind to a halt.

OBJECTIVES OF THE STUDY

- To understand the Problems encountered in production planning
- To evaluate the Problems encountered in operating the production of goods and services
- To analyse the problems encountered in controlling the production of goods and services
- To identify the remedial measures to overcome the problems encountered in production efficiency.

II. REVIEW OF LITERATURE

Paulina Boutros Johan Borjesson (2022). The aim of this study is to investigate the optimisation of production planning- and scheduling in a pharmaceutical facility using DES. This study has been compared to a deductive- and a quantitative research approach where a process simulation has been modelled. The theoretical framework was based on books and scientific publications. Empirical data was collected through unstructured observations at the production site, frequent meetings together with the company and through the company's database Discoverant. Based on the results from the simulation model conclusions could be drawn. The study concluded that there are bottlenecks at the beginning of the processes in all three production flows for Medicine A, Medicine B and Medicine C. If these are raised it would generate greater flexibility and efficiency in the production. There were also indications of a new allocation of resources that would raise efficiency in the production, thus making it possible to increase the output from the production.

Renna, Paolo, and Sergio Materi. 2021. Climate change mitigation, the goal of reducing CO₂ emissions, more stringent regulations and the increment in energy costs have pushed researchers to study energy efficiency and renewable energy sources. Manufacturing systems are large energy consumers and are thus responsible for huge greenhouse gas emissions; for these reasons, many studies have focused on this topic recently. This review aims to summarize the most important papers on energy efficiency and renewable energy sources in manufacturing systems published in the last fifteen years. The works are grouped together, considering the system typology, i.e., manufacturing system subclasses (single machine, flow shop, job shop, etc.) or the assembly line, the developed energy-saving policies and the implementation of the renewable energy sources in the studied contexts. A description of the main approaches used in the analyzed papers was discussed. The conclusion reports the main findings of the review and suggests future directions for the researchers in the integration of renewable energy in the manufacturing systems consumption models.



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P M Kosianov (2019). The work shows various ways to improve the efficiency of oil production. A comparative analysis was carried out. Considered the most environmentally friendly ways. Considered physical models and the most important averaged parameters for them are defined. Identified ways to influence these parameters. The expressions are shown that allow to calculate the volumes of oil filtered through the sections of the bottomhole zone of the reservoir. The problem of determining the viscosity of oil. The methods of steam-thermal impact on the formation, their advantages and opportunities are considered in detail. Identified problems, shows how to solve them. Solutions were found for turning water into saturated steam in a closed volume of a drilling tool. The quantities that evaluate the effectiveness of the device are determined and calculated quantitatively. The optimal size and shape of the nozzles are determined. Calculated steam flow rate from the nozzles of the device, the reactive forces arising in the device and the torque generated by the forces. The relevance and prospects of these methods are shown. at development of deposits with high viscosity oils.

III. RESEARCH METHODOLOGY

The research design adopted for the study is descriptive design. This study is conducted by simple random sampling. Both primary and secondary data have been ensuring accuracy and reliability. The study sampling size is 110. The main tools used for analysis include Simple Percentage Analysis, Chi-Square Test, and Correlation Analysis.

Data analysis and interpretation

Table No. 1 GENDER OF THE RESPONDENTS

Gender	Frequency	Percentage (%)
Male	64	58.18
Female	46	41.82
Total	110	100

Source: Primary data

Interpretation

The majority of respondents are male (58.18%), while females make up 41.82% of the sample.

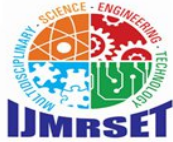
Table No. 2 AGE OF THE RESPONDENTS

Age Group	Frequency	Percentage (%)
Below 20 years	12	10.91
20 – 30 years	38	34.55
31 – 40 years	30	27.27
41 – 50 years	18	16.36
Above 50 years	12	10.91
Total	110	100

Source: Primary data

Interpretation

The majority of respondents belong to the 20–30 years age group (34.55%), followed by those in the 31–40 years category at 27.27%. Respondents aged 41–50 years account for 16.36%, while individuals below 20 years and above 50 years each represent 10.91% of the sample. This indicates that the respondents are largely concentrated in the younger and middle-age groups, which may contribute to active participation, adaptability, and better engagement in the study.



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Table No. 3 PROBLEMS ENCOUNTERED IN PRODUCTION PLANNING

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Total
Delay in Raw Material Sourcing and Approval	30 (27.3%)	45 (40.9%)	15 (13.6%)	12 (10.9%)	8 (7.3%)	110 (100%)
Delay in Sample Approval	25 (22.7%)	40 (36.4%)	20 (18.2%)	15 (13.6%)	10 (9.1%)	110 (100%)
Production Delay	28 (25.5%)	42 (38.2%)	18 (16.4%)	12 (10.9%)	10 (9.1%)	110 (100%)
Recording and Communication of Wrong Data	22 (20.0%)	40 (36.4%)	25 (22.7%)	15 (13.6%)	8 (7.3%)	110 (100%)
Failure in Final QA Inspection	20 (18.2%)	38 (34.5%)	25 (22.7%)	17 (15.5%)	10 (9.1%)	110 (100%)

Source: Primary data

Interpretation

27.3% of respondents strongly agree and 40.9% agree that delays in raw material sourcing and approval affect production efficiency, while 13.6% are neutral, 10.9% disagree, and 7.3% strongly disagree. Regarding delays in sample approval, 22.7% strongly agree and 36.4% agree, with 18.2% neutral, 13.6% disagree, and 9.1% strongly disagree. Production delays are acknowledged by 25.5% strongly agree and 38.2% agree, 16.4% neutral, 10.9% disagree, and 9.1% strongly disagree. Errors in recording and communication of data are reported by 20% strongly agree and 36.4% agree, 22.7% neutral, 13.6% disagree, and 7.3% strongly disagree. Failures in final quality assurance inspection are noted by 18.2% strongly agree and 34.5% agree, 22.7% neutral, 15.5% disagree, and 9.1% strongly disagree.

Table No. 4 REMEDIAL MEASURES TO IMPROVE PRODUCTION EFFICIENCY

Statements	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Total
Up-skilling employees for modern era	35 (31.8%)	45 (40.9%)	15 (13.6%)	10 (9.1%)	5 (4.6%)	110 (100%)
Investing in maintenance of resources and infrastructure	30 (27.3%)	48 (43.6%)	18 (16.4%)	10 (9.1%)	4 (3.6%)	110 (100%)
Frequent review of the workflow	28 (25.5%)	44 (40.0%)	20 (18.2%)	12 (10.9%)	6 (5.5%)	110 (100%)
Successful integration of planning, operating, and controlling	32 (29.1%)	46 (41.8%)	18 (16.4%)	10 (9.1%)	4 (3.6%)	110 (100%)
Ensuring the right person is assigned to specific processes	33 (30.0%)	44 (40.0%)	17 (15.5%)	10 (9.1%)	6 (5.5%)	110 (100%)

Source: Primary data



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Interpretation

31.8% of respondents strongly agree and 40.9% agree that up-skilling employees for the modern era can improve production efficiency, while 13.6% are neutral, 9.1% disagree, and 4.6% strongly disagree. Investing in maintenance of resources and infrastructure is supported by 27.3% strongly agree and 43.6% agree, 16.4% neutral, 9.1% disagree, and 3.6% strongly disagree. Frequent review of workflows receives 25.5% strongly agree and 40% agree, 18.2% neutral, 10.9% disagree, and 5.5% strongly disagree. Successful integration of planning, operating, and controlling has 29.1% strongly agree and 41.8% agree, 16.4% neutral, 9.1% disagree, and 3.6% strongly disagree. Ensuring the right person is assigned to specific processes is agreed upon by 30% strongly agree and 40% agree, 15.5% neutral, 9.1% disagree, and 5.5% strongly disagree.

CHI-SQUARE ANALYSIS - RELATIONSHIP BETWEEN THE GENDER OF THE RESPONDENTS AND PROBLEMS ENCOUNTERED IN PRODUCTION PLANNING

Null hypothesis (Ho):

There is no significant relationship between the gender of the respondents and problems encountered in production planning.

Alternative hypothesis (H1):

There is some significant relationship between the gender of the respondents and problems encountered in production planning.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.962 ^a	15	.605
Likelihood Ratio	14.100	15	.518
Linear-by-Linear Association	5.040	1	.025
N of Valid Cases	110		

a. 25 cells (78.1%) have expected count less than 5. The minimum expected count is .32.

INTERPRETATION

As per the above table, it is inferred that the P value is 0.605; it is not significant to 5% (0.05) significant level. The minimum expected count is 0.32. Thus null hypothesis is accepted and it is found that there is no significant relationship between the gender of the respondents and problems encountered in production planning.

CORRELATION ANALYSIS-RELATIONSHIP BETWEEN AGE OF THE RESPONDENTS AND REMEDIAL MEASURES TO OVERCOME THE PROBLEMS ENCOUNTERED IN PRODUCTION EFFICIENCY

Correlations			
		AGE OF THE RESPONDENTS	MEASURES
AGE OF THE RESPONDENTS	Pearson Correlation	1	.224*
	Sig. (2-tailed)		.019
	N	110	110
REMEDIAL MEASURES TO OVERCOME THE PROBLEMS ENCOUNTERED IN PRODUCTION EFFICIENCY	Pearson Correlation	.224*	1
	Sig. (2-tailed)	.019	
	N	110	110

*. Correlation is significant at the 0.05 level (2-tailed).



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INTERPRETATION:

The above table indicates that out of 110 respondents, co-efficient of correlation between the age of the respondents and remedial measures to overcome the problems encountered in production efficiency is 0.224. It is below 1. So there is positive relationship between age of the respondents and remedial measures to overcome the problems encountered in production efficiency.

V. SUGGESTIONS

- There should not be any delay in raw material sourcing and approval since it is base for the production process.
- The company must ensure for immediate sample approval and make decision on the sample.
- There should not be any production delay then it leads to entire disruption in the sales aspects.
- The data must be an accuracy one to flow among the employees in the concern. It should not have any error to proceed.
- There must not be any ethical issues for the production in the company.
- The company must ensure the well structured infrastructure for production efficiency.
- The system design must be well framed and plant lathe must be well designed for production convenience and the production demands have to be scheduled properly. It must be met by the production department promptly.
- The inventory level must be an optimum level. It should not be too high and too low.
- The supply chain management must be controlled properly. There should not be any deviation in the control aspects.
- The company must implement the successful efficient software for all aspects of tasks.
- The employees must be trained properly and they must be well prepared to offer the services and the top level management must contribute to maintain the resources and infrastructure.
- There must be successful integration of planning, operating and controlling on the organization.
- There must be right person to accomplish the tasks to successfully complete.

VI. CONCLUSION

Production efficiency in manufacturing is a crucial issue that manufacturing houses grapple with. While the ultimate aim is always to keep the efficiency of production at its largest, it is not the easiest task. Manufacturing companies determine their maximum capacity which they can achieve through their current set of assets. It helps them in determining if they are being efficient with the available resources or if there is a scope to improve production efficiency. It is concluded that the top level management must contribute their resources and upgrade their infrastructure to obtain production efficiency. The company must offer frequent training for the employees to attain production efficiency. There must be successful integration of planning, operating and controlling for production efficiency.

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