

# “A REVIEW FOSTERS A CULTURE OF CONTINUOUS IMPROVEMENT TOWARDS THE EFFECTS OF LEAN MANUFACTURING METHODS”

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## Abstract

Lean manufacturing is a process that aims to mitigate waste and enhance efficiency throughout production processes. Waste is referred to as anything that consumers refuse to pay for and disagree with that offers value. There are numerous advantages associated with lean manufacturing, including shortened lead times, more affordable operating costs, and higher-quality products. The impact of lean manufacturing techniques on overall organizational performance and operational efficiency. This study evaluates both primary and secondary data. Here simple random sampling is used to evaluate the research. Examined is the effectiveness of key lean approaches in reducing waste, increasing output, and improving product quality, such as 5S, Value Stream Mapping (VSM), Kaizen, and Just-in-Time (JIT). The results show that implementing lean concepts significantly raises employee happiness, reduces costs, and increases productivity. However, the report also identifies obstacles to implementing lean concepts, such as the requirement for ongoing development and cultural transformation. Based on the findings, a company can gain a competitive advantage by implementing lean manufacturing effectively inside its organizational structure.

**Keywords:** Lean manufacturing techniques, 5S, kaizen, JIT, operational efficiency, continuous improvement.

## 1.1. Introduction

Lean production is an approach to optimizing productivity and eliminating waste in the production process. Whatever customers do not think adds benefit and are unable to pay for is regarded as waste. Lean manufacturing offers numerous benefits, reduced operating expenses, and better-quality goods. The reason lean manufacturing is so popular is because it is effective. The effectiveness of lean manufacturing is the reason for its widespread adoption. Specifically, it minimizes lead times by 99 percent on average, reduces inventory overhead, puts off expenditures on capital, lowers over time, and promotes throughput. Lean manufacturing offers several advantages, including improved stock turns, superior quality, improved customer service, and better inventions, in addition to the noticeable improvements in performance and value-added per person. Lean management aims for continuous improvements, which helps provide customers with better-quality products. This can also improve the innovation and product enhancement processes. After making changes, businesses can re-evaluate their procedures to see how they might be better and serve their customers even better. Minimizing manufacturing costs can be accomplished by minimizing waste, keeping the most of the time, and performing tasks as efficiently as possible. This helps organizations stay successful in the market by offering better items at reduced prices. In addition, it helps organization improve their customer service, enhance sales, and allocate more funds for the development of new products.

## 1.2 Review of Literature

**Renato L. M. Morais, et al (2024)**, “A review of lean manufacturing techniques for sustainable construction”, International Journal of Production. This study examines the application of lean manufacturing techniques in

the construction industry, discussing their potential benefits for project management, productivity improvement, and environmental sustainability. Lean manufacturing techniques offer significant potential for enhancing efficiency, reducing waste, and promoting sustainability in the construction sector, leading to improved project outcomes and industry competitiveness.

**Ramakrishnan Ramanathan, et al (2023)**, “Lean manufacturing and digitalization”, International Journal of Lean Six Sigma. This study examines the integration of lean manufacturing principles with digital technologies, analysing their combined impact on operational performance, quality, and innovation. Leveraging digitalization to enhance lean manufacturing practices improves agility, responsiveness, and competitiveness in dynamic business environments.

### 1.3 Research Gap

The focus of the current research may be on applying lean manufacturing techniques. To fully understand how lean manufacturing may be used to support sustainable development in a variety of industries, more study on lean and sustainable manufacturing is required. The criteria employed to gauge sustainability outcomes require special attention in this study. research examining the long-term effects and sustainable development of lean manufacturing applications.

### 1.4 Objectives of the Study

- To understand the various lean techniques followed by the firm.
- To know about the efficiency of continuous improvement as it relates to the lean manufacturing process.
- To study the implementation of lean methodologies followed by the firm.

### 1.5 Research Methodology

**Instrumental Design:** Six questions were created for each element of the structured questionnaire using Guttman two-point rating system.

**Data Collection Method:** The study collected primary and secondary data on the variables influencing information collected through company employee and employer through questionnaire.

**Sample Size and Sampling Technique:** The sample size of the study is 150 respondents. The method of easy simple random sampling was employed to gather the data.

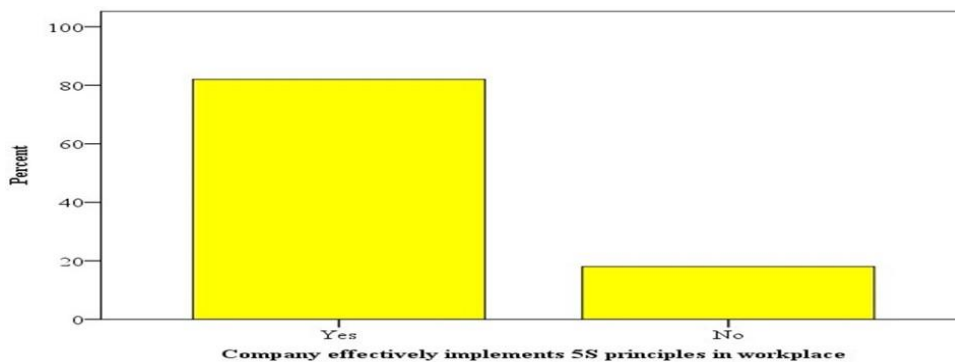
**Data Analysis:** Descriptive analysis were used to analyse the data. Percentage Analysis is applied to create a contingency table from the frequency distribution and represent the collected data for better understanding.

Chart Analysis is applied for better understanding of the percentage analysis and it is done via bar charts.

### Company effectively implements 5S principles in workplace

Table. No. 1.1 Company effectively implements 5S principles in workplace

Particulars	Frequency	Percentage
Yes	123	82
No	27	18
<b>Total</b>	<b>150</b>	<b>100</b>



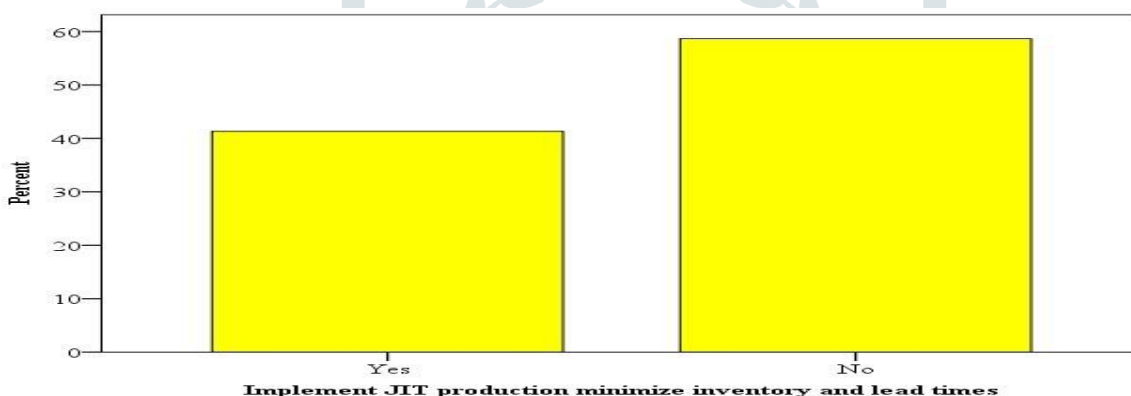
**Fig. No. 1.1. Company effectively implements 5S principles in workplace**

**Inference:** From the above table, it is inferred that 82% of the respondents are YES and 18% of the respondents are NO.

**Implement JIT production minimize inventory and lead times**

**Table. No. 1.2 Implement JIT production minimize inventory and lead times**

Particulars	Frequency	Percentage
Yes	62	41.3
No	88	58.7
<b>Total</b>	<b>150</b>	<b>100</b>



**Fig. No. 1.2 Implement JIT production minimize inventory and lead times**

**Inference:** From the above table, it is inferred that 58.7% of the respondents are NO and 41.3% of the respondents are YES.

**Changes in lean manufacturing techniques**

**Table. No. 1.3 Changes in lean manufacturing techniques**

Particulars	Frequency	Percentage
Yes	83	55.3
No	67	44.7
<b>Total</b>	<b>150</b>	<b>100</b>

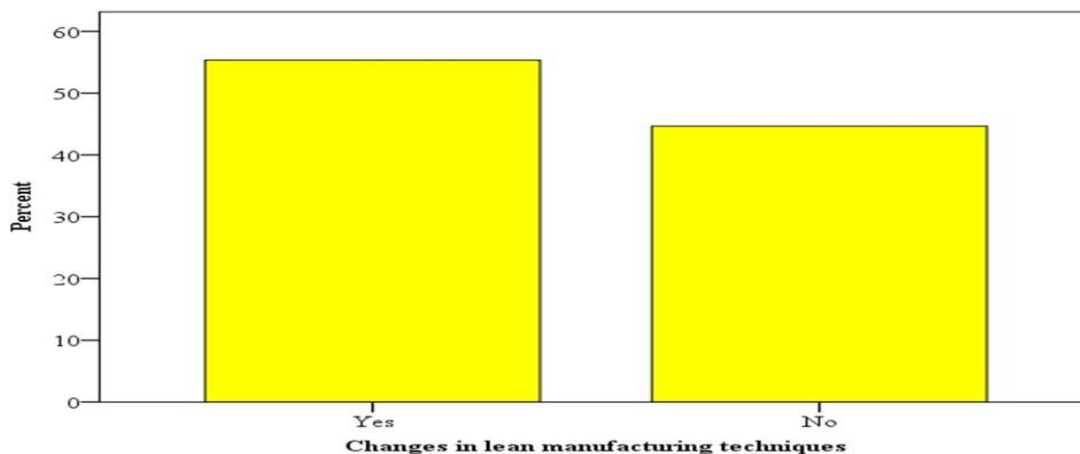


Fig. No. 1.3 Changes in lean manufacturing techniques

**Inference:** From the above table, it is inferred that 55.3% of the respondents are YES and 44.7% of the respondents are NO.

**Company implement kanban techniques effectively utilized**

Table. No. 1.4 Company implement kanban techniques effectively utilized

Particulars	Frequency	Percentage
Yes	71	47.3
No	79	52.7
<b>Total</b>	<b>150</b>	<b>100</b>

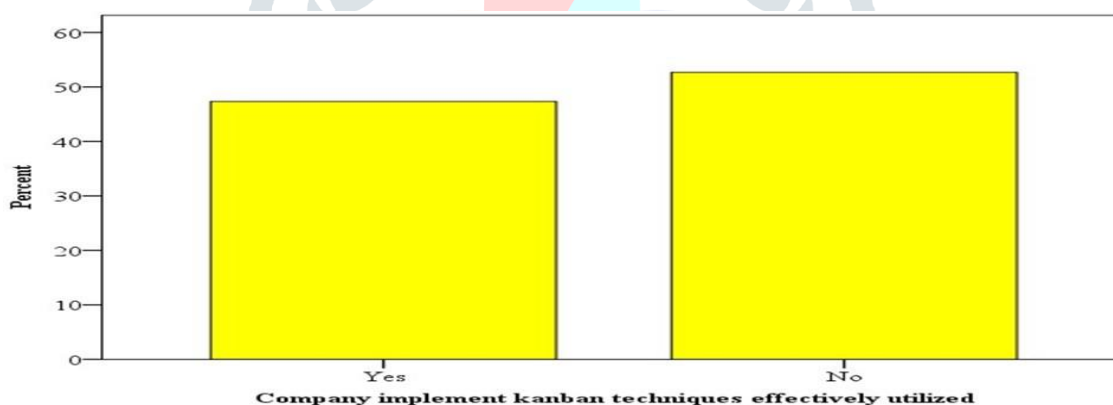


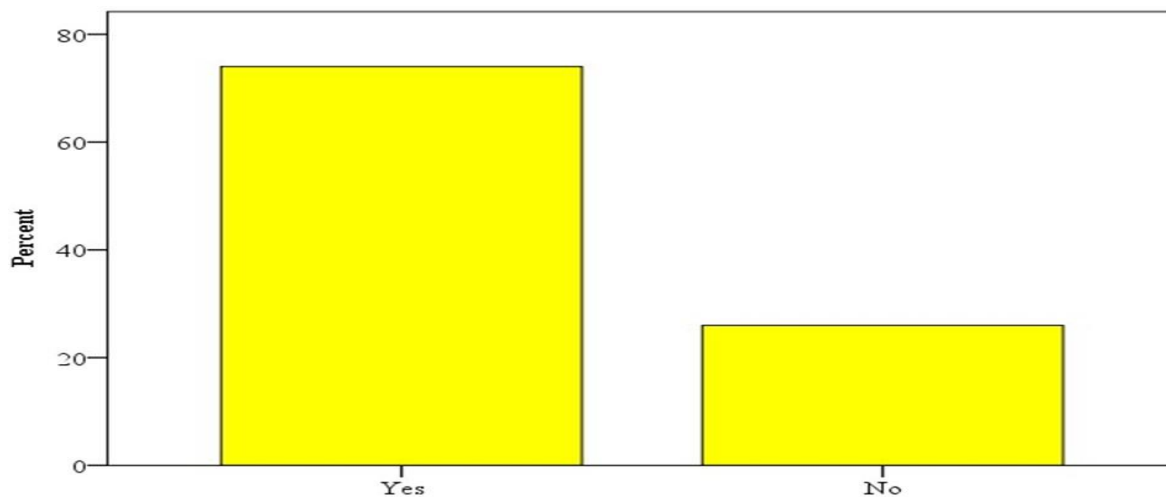
Fig. No. 1.4 Company implement kanban techniques effectively utilized

**Inference:** From the above table, it is inferred that 52.7% of the respondents are NO and 47.3% of the respondents are YES.

**Company continuous improvement initiatives closely align lean**

Table. No. 1.5 Company continuous improvement initiatives closely align lean

Particulars	Frequency	Percentage
Yes	111	74
No	39	26
<b>Total</b>	<b>150</b>	<b>100</b>



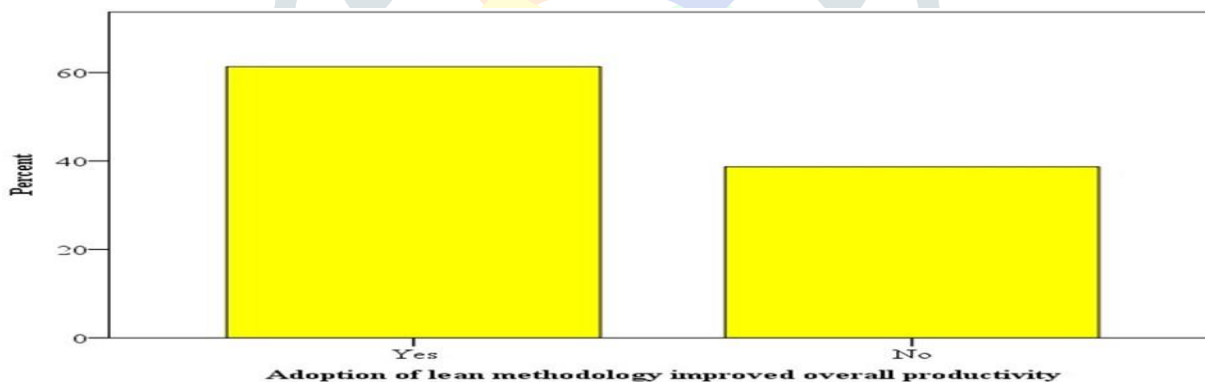
**Fig. No.1.5. Company continuous improvement initiatives closely align lean**

**Inference:** From the above table, it is inferred that 74% of the respondents are YES and 26% of the respondents are NO.

**Adoption of lean methodologies improved overall productivity**

**Table. No. 1.6 Adoption of lean methodologies improved overall productivity**

Particulars	Frequency	Percentage
Yes	92	61.3
No	58	38.7
<b>Total</b>	<b>150</b>	<b>100</b>



**Fig. No. 1.6 Adoption of lean methodologies improved overall productivity**

**Inference:** From the above table, it is inferred that 61.3% of the respondents are YES and 38.7% of the respondents are NO.

**Chi-Square Tests**

**Null hypothesis**

H0: There is no significant association between the integrated lean principles & improved overall productivity.

**Alternative hypothesis**

H1: There is significant association between the integrated lean principles & improved overall productivity.

## Summary of chi-square

Table. No.1.7. Summary of the chi-square

	Case					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Integrated lean principles x Improved overall productivity	150	100	0	0	150	100

Table. No. 1.8 Test statistics

	Value	df	Asymptotic. Sig. (2tailed)
Pearson Chi-square	.051	1	.821
Likelihood Ratio	.051	1	.821
No of Valid Cases	150		

**Inference:** From the above table 1.8, the significant value is  $p=.821$  which is greater than 0.05. So, alternative hypothesis is accepted, it reveals that there is significant association between integrated lean principles and improved overall productivity.

### Correlation

#### Null hypothesis

H0: There is no significant relationship between 5S principles & organized production line.

#### Alternative hypothesis

H1: There is significant relationship between 5S principles & organized production line.

### Correlation

Table. No. 1.9 Correlation

Correlation values		5S Principles	Organized Production Line
5S Principles	Pearson Correlation	1.000	.279
	Sig. (2-tailed)		.001
	N	150	150
Organized Production Line	Pearson Correlation	.279	1.000
	Sig. (2-tailed)	.001	
	N	150	150

**Inference:** From the above table 1.9, it is inferred that,  $r=.279$  (r value lies between -1 to +1), hence it is clear that there is positive correlation relationship between 5S principles and organized production line. So, Alternative hypothesis is accepted, this reveals that there is a significant relationship between 5S principles and organized production line.

## 1.6 Suggestions

- By conducting a thorough analysis of existing production processes, you may identify areas where JIT can be applied effectively.
- I would like to suggest organizing a comprehensive training session for all employees to ensure they understand and correctly follow the adapted instructions.
- I believe it would be beneficial while schedule regular stand-up meetings and reviews to update the Kanban technique this keeps team align and aware with current progress and obstacles.
- I could suggest you to fostering a culture of continuous improvement and open communication throughout the organization which may leads to effectively implementing required improvement areas.
- Lean manufacturing involves workers in problem-solving and decision-making processes which make them to be attentive to quality issues and take proactive measures.

## 1.7 Limitations of the study

- Many of the respondents are not willing to fill the questionnaires.
- The challenging task is collecting primary data because of their hectic work schedule.
- It is difficult to gather responses because the majority of respondents are male.

## 1.8 Conclusion

This research gives a valuable insight about lean manufacturing methods, have significant effects on many different areas of an organization and lead to increased output, reduced junk, and enhanced efficiency. Lean manufacturing concentrates on value creation and minimizes non-value-adding tasks, which improves processes and fosters a culture of continuous improvement. Among the benefits are fewer operating expenses, faster production plans, and better-quality goods. Lean methods encourage collaboration as well as solving issues above all else, which makes employees more engaged. All organizational levels must be committed to the implementation process and be open to making adjustments as needed to ensure success.

## 1.9 Reference

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