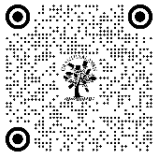


A STUDY THE LIMITATIONS OF LEAN PRODCUTION CONTROL IN AUTOMOBILE INDUSTRIES AT PUNE ZONE

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DOI

[10.29121/shodhkosh.v5.i6.2024.1651](https://doi.org/10.29121/shodhkosh.v5.i6.2024.1651)

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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ABSTRACT

Lean Production Planning and Control is to be contrasted with project controls. His effectiveness of Lean Production Planning and Control is sometimes limited because of external factors, which are beyond the control of Production Manager. Sudden break-down or beak-out of war, government control, natural calamities, change in fashion, change in technology, etc. As explained, project controls have developed to become centralized functions to track project progress and identify deviations from plan and to forecast future progress, using metrics rooted in accounting principles. Thus, lean production control is some scientific procedure to regulate an orderly flow of material and co-ordinate various production operations to accomplish the objective of producing desired item. In right quantity of desired quality at the required time by the best and the cheapest method i.e., to attain highest efficiency in production. Alternately, production control is the function of management, which plans, directs and controls the material supply and processing activities of an enterprise; so that specified products are produced by specified methods to meet an approved sales program. It ensures that the activities are carried in such a way that the available labor and capital are used in the best possible way.

Keywords: Lean Production Control, Quantity, Quality, Efficiency of Production, Labour

1. INTRODUCTION

Production Planning and Control: Objectives, Importance, and Limitations...Planning and control are interrelated and interdependent. Planning is meaningless unless control action is taken to ensure the success of the plan. Control also provides information feedback which helps modify the existing plans and in making new plans. Similarly, control is dependent on planning as the standards of performance are laid down under planning. Therefore, lean production planning and control should be considered an integrated function of planning to ensure the most efficient production and regulation of operations to execute the plans successfully. Lean Production planning and control may be defined as the direction

and coordination of the firm's material and physical facilities towards the attainment of pre-specified production goals in the most efficient available way.

2. DEFINITION

"Lean Production control is a specific application of the control function and is concerned with recording results and correcting for deviations from programmes and variations from standards". By. William Voris 1

3. OBJECTIVE

- 1) To study the Limitations of Lean Production Control in selected large-scale industries.
- 2) To study the awareness and usage of Lean Production Control in various functions of Automobile industries in Pune Zone.

4. HYPOTHESES OF STUDY

- 1) H1: -There is significant difference across limitations of Lean production control in in selected a large scale industries.
- 2) Ho. -There is no There is significant difference across limitations of Lean production control in selected Automobile industries.
- 3) H2: -There is significant difference across the awareness and usage about production control practices in lean Automobile Industries gives positive impact on business performance.
- 4) H0: - There is no significant difference across the awareness about lean production control practices in Automobile Industries gives positive impact on business performance.

5. SCOPE OF STUDY

- 1) Lean Production with purchase department for efficient and effective procurement of inputs.
- 2) Lean Production with marketing department to determine the nature and magnitude of the output.
- 3) To plan the layout of the operations indicating in detail the places/points in the system where various lean production activities/operations are to be performed.
- 4) Establishment of time schedules for various stages/ levels of lean production by Setting up necessary standards.
- 5) Ensuring continuous inspection over the quality of goods manufactured.
- 6) Instituting necessary controls to complete the work according to schedule.
- 7) To Ensure that to improve in your Industries Right quality, Right quantity, Right time and Right cost.
- 8) The study will be restricted to Pune Zone only

6. LIMITATION

Every research will have its own limitation and similarly the present research has its own limitations. They are listed below:

- 1) The researcher has selected the respondents who have at least one year of experience as an Employee of any organisation and also eligible for the
- 2) The study covers the period 2022-2023, so the result of the study (Perception of Lean Production Control in Automobile Industries) is restricted to the above-mentioned period, and it may change in future.

7. ADVANTAGES OF LEAN PRODUCTION CONTROL

- 1) To achieve lean production targets and goals.
- 2) To ensure smooth lean production by removing difficulties in the production process.
- 3) To coordinate machines, tools, labour and materials for optimum utilisation of resources.
- 4) To minimise cost of production and to maintain quality of output.
- 5) To guide purchase and supply of materials to suit production rate.
- 6) To control inventories.

8. REVIEW OF LITERATURE

In review of literature presents an overview of the lean production control in large scale industries, various factors contributing for the successful implementation of lean production control system, and multi criteria decision making models attempted by researchers. Before going deep into the research work, it is necessary to undertake a journey into relevant literature on the study area and the context. Review of relevant studies enable us to get a detailed knowledge of the topic and to conduct the study in a different perspective from that of the existing studies in the relevant field. For this purpose, it is necessary to review research paper, and articles published in reputed journals and several popular and focused books, which give broad perspective on the conceptual framework of the study undertaken. The details of the literature reviewed are gather as per questionnaire circulated among the customers.

9. RESEARCH GAP

Before carrying out any research, it is mandatory that the researcher does a survey of literature available and determine the research gap that the research will try to bridge. Similarly, the researcher has carried out a review of literature available and narrowed down the research gap. There have many studies that focuses on the various production control system in large-scale industries. Particularly numerable researcher can be found analyzing the behaviour and satisfaction of the industries. Towards the various Lean Production Planning and Control Systems. However, there are very few research available that analyses the awareness level and knowledge level of the Lean Production Control Automobile Industries. (Employers of different Automobile Industries within the aware about production control, benefits and loss) and connecting them with the perception of the Industries towards Lean Production Control System (Tools and Techniques).

After analyzing various researchers, the researcher has arrived at the present gap and in the present research will try to bridge this gap.

10. ANALYSIS

Which are key factors that makes limitations for lean production and Practices with respect to business performance of your industry?

Table 1

Table 1 Lack of Reliable Data					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	3	9.7	9.7	9.7
	Not Limited	5	16.1	16.1	25.8
	Neutrals	8	25.8	25.8	51.6
	Limited	6	19.4	19.4	71
	Highly Limited	9	29	29	100
	Total	31	100	100	

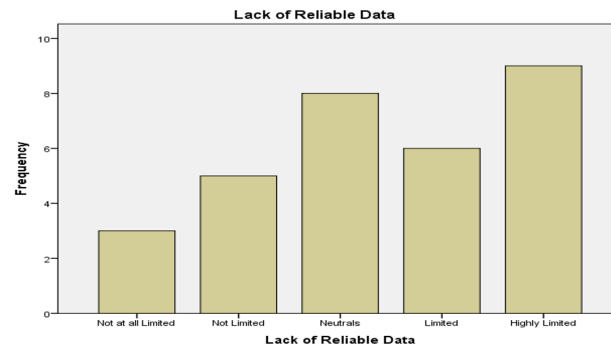


Table 2

Table 2 Time Consuming Process					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	3	9.7	9.7	9.7
	Not Limited	1	3.2	3.2	12.9
	Neutrals	7	22.6	22.6	35.5
	Limited	11	35.5	35.5	71
	Highly Limited	9	29	29	100
	Total	31	100	100	

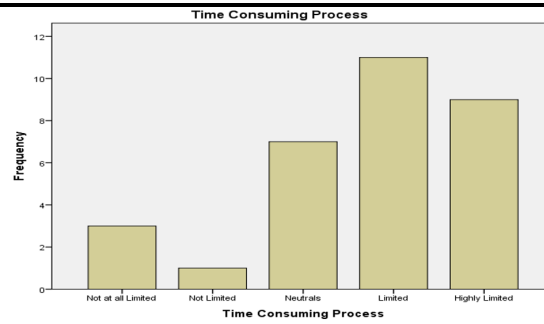


Table 3

Table 3 Expensive					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	3	9.7	9.7	9.7
	Not Limited	1	3.2	3.2	12.9
	Neutrals	9	29	29	41.9
	Limited	8	25.8	25.8	67.7
	Highly Limited	10	32.3	32.3	100
	Total	31	100	100	

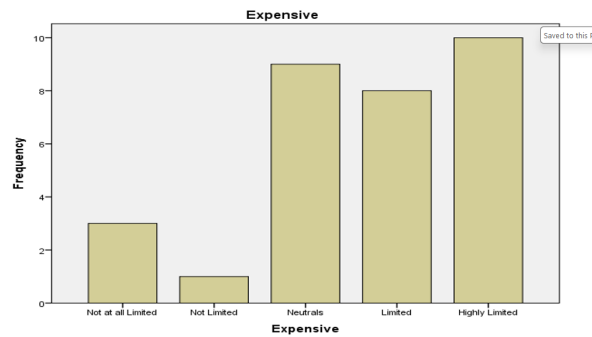


Table 4

Table 4 External Factors may Reduce Utility					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	2	6.5	6.5	6.5
	Not Limited	4	12.9	12.9	19.4
	Neutrals	7	22.6	22.6	41.9
	Limited	9	29	29	71
	Highly Limited	9	29	29	100
	Total	31	100	100	

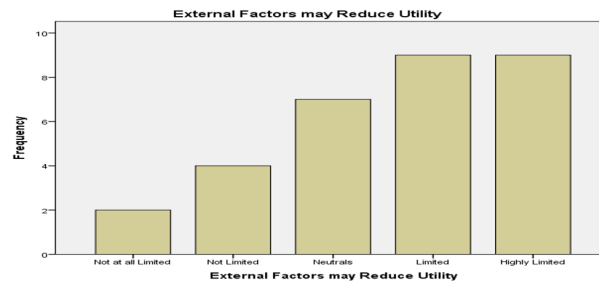


Table 5

Table 5 Sudden Emergencies					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	3	9.7	9.7	9.7
	Not Limited	1	3.2	3.2	12.9
	Neutrals	6	19.4	19.4	32.3
	Limited	11	35.5	35.5	67.7
	Highly Limited	10	32.3	32.3	100
	Total	31	100	100	

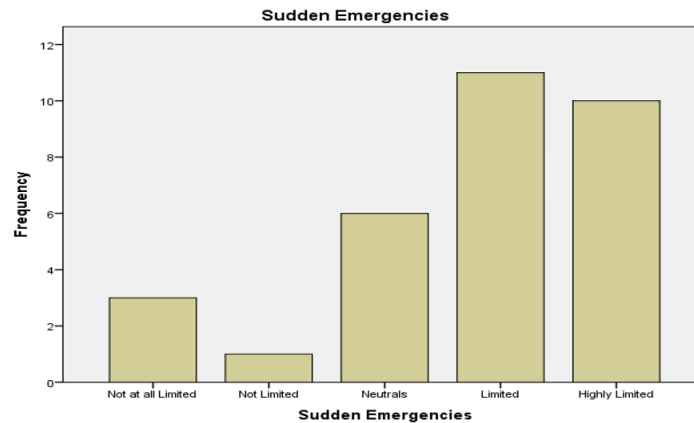


Table 6

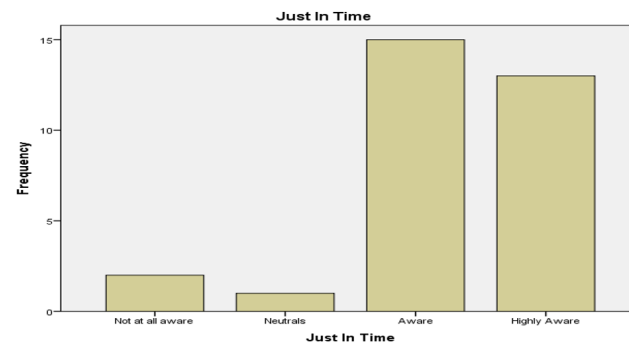
Table 6 Resistance to Change					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all Limited	3	9.7	9.7	9.7
	Not Limited	2	6.5	6.5	16.1
	Neutrals	9	29	29	45.2
	Limited	7	22.6	22.6	67.7
	Highly Limited	10	32.3	32.3	100
	Total	31	100	100	



Q.1 Rate the following practices based on level of awareness of present lean production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (Just In Time)

Table 7

Table 7 Just in Time					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	2	6.5	6.5	6.5
	Neutrals	1	3.2	3.2	9.7
	Aware	15	48.4	48.4	58.1
	Highly Aware	13	41.9	41.9	100
	Total	31	100	100	



INTERPRETATION: 1

Researcher has depicted that out of 100% (n=31) respondents, n=13 are highly aware of the Just in Time production Method, n=15 are aware of the Just in Time lean production Method, n=1 is neutral about the Just in Time production Method and n=2 respondents are not at all aware of the Just in Time production Method.

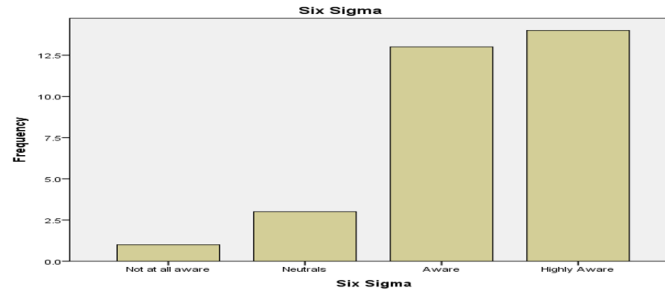
Rate the following practices based on level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (Six Sigma).

Q2. Rate the following practices on the basis of level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (Six Sigma).

Table 8

Table 8 Six Sigma

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Neutrals	3	9.7	9.7	12.9
	Aware	13	41.9	41.9	54.8
	Highly Aware	14	45.2	45.2	100
	Total	31	100	100	



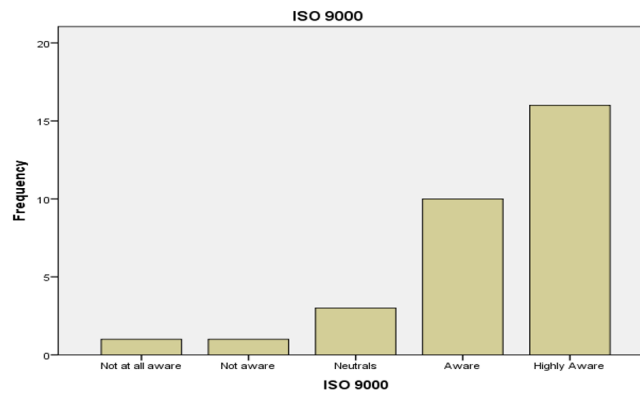
INTERPRETATION: 2

Researcher has depicted that out of 100% (n=31) respondents, n=14 is highly aware of the Six Sigma production Method, n=13 is aware of the Six Sigma production Method, n=3 is neutral about the Six Sigma production Method and n=1 respondents are not at all aware of the Six Sigma production Method.

Q3. Rate the following practices based on level of awareness of present lean production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (ISO 9000)

Table 9

Table 9 ISO 9000					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Not aware	1	3.2	3.2	6.5
	Neutrals	3	9.7	9.7	16.1
	Aware	10	32.3	32.3	48.4
	Highly Aware	16	51.6	51.6	100
	Total	31	100	100	



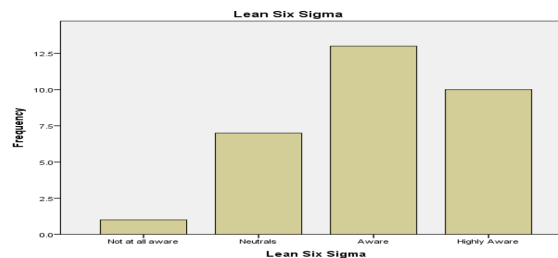
INTERPRETATION: 3

It is observed that out of 100% (n=31) respondents, n=16 is highly aware of the ISO 9000 production Method, n=10 is aware of the ISO 9000 production Method, n=3 is neutral about the ISO 9000 production Method, n=1 respondents are not aware of the ISO 9000 production Method and n=1 respondent is not at all aware of the ISO 9000.

Q4. Rate the following practices based on level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (Lean Six Sigma)

Table 10

Table 10 Lean Six Sigma					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Neutrals	7	22.6	22.6	25.8
	Aware	13	41.9	41.9	67.7
	Highly Aware	10	32.3	32.3	100
	Total	31	100	100	



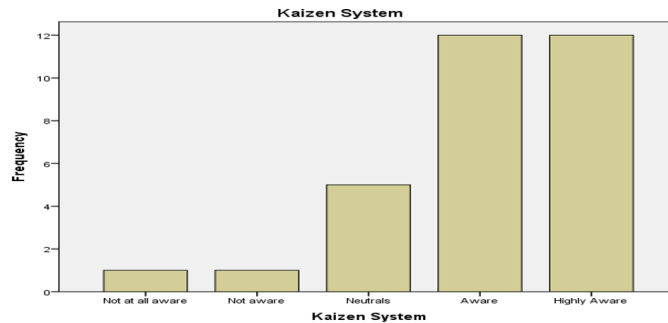
INTERPRETATION: 4

It was depicted that out of 100% (n=31) respondents, n=10 is highly aware of the Lean Six Sigma Production Method, n=13 is aware of the Lean Six Sigma Production Method, n=7 is neutral about the Lean Six Sigma Production Method and n=1 respondents are not at all aware of the Lean Six Sigma Production Method.

Q5. Rate the following practices based on level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (Kaizen System)

Table 11

Table 11 Kaizen System					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Not aware	1	3.2	3.2	6.5
	Neutrals	5	16.1	16.1	22.6
	Aware	12	38.7	38.7	61.3
	Highly Aware	12	38.7	38.7	100
	Total	31	100	100	

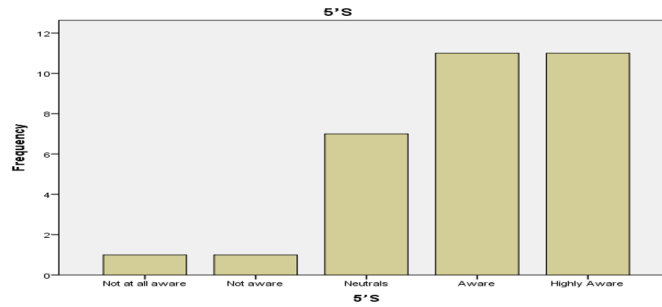
**INTERPRETATION: 5**

It is observed that out of 100% (n=31) respondents, n=12 is highly aware of the Kaizen System Production Method, n=12 is aware of the Kaizen System, Lean Production Method, n=5 is neutral about the Kaizen System Production Method and n=1 respondent is not aware and n=1 respondent is not at all aware of the Kaizen System Production Method

Q6. Rate the following practices based on level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (5'S)

Table 12

Table 12 5'S					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Not aware	1	3.2	3.2	6.5
	Neutrals	7	22.6	22.6	29
	Aware	11	35.5	35.5	64.5
	Highly Aware	11	35.5	35.5	100
	Total	31	100	100	



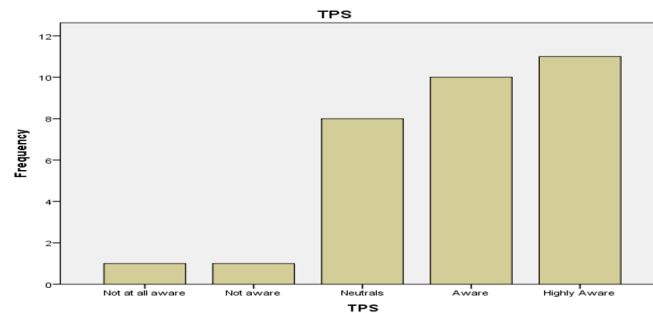
INTERPRETATION: 6

It is observed that out of 100% (n=31) respondents, n=11 is highly aware of the 5's Lean Production Method, n=11 is aware of the 5's Production Method, n=7 is neutral about the 5's Production Method and n=1 respondent is not aware and n=1 respondent is not at all aware of the 5's Lean Production Method.

Q7. Rate the following practices based on level of awareness of present lean production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (TPS)

Table 13

Table 13 TPS					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Not aware	1	3.2	3.2	6.5
	Neutrals	8	25.8	25.8	32.3
	Aware	10	32.3	32.3	64.5
	Highly Aware	11	35.5	35.5	100
	Total	31	100	100	



INTERPRETATION: 7

Researcher has depicted that out of 100% (n=31) respondents, n=11 is highly aware of the 5's Lean Production Method, n=10 is aware of the 5's Lean Production Method, n=8 is neutral about the 5's Lean Production Method and n=1 respondent is not aware and n=1 respondent is not at all aware of the 5's Production Method.

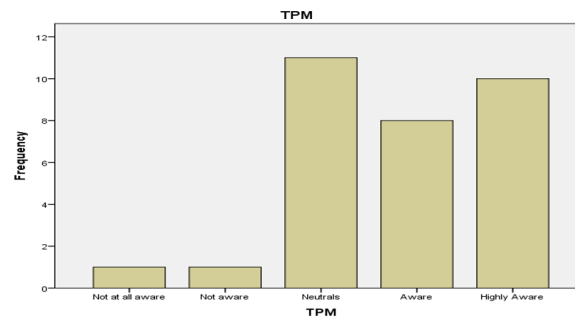
Q8. Rate the following practices on the basis of level of awareness of present production control practices in your industry? (1. Not at all aware, 2. Not aware, 3. Neutral, 4. Aware, 5. Highly aware)? (TPM)

Table 14

Table 14 TPM					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all aware	1	3.2	3.2	3.2
	Not aware	1	3.2	3.2	6.5
	Neutrals	11	35.5	35.5	41.9
	Aware	8	25.8	25.8	67.7
	Highly Aware	10	32.3	32.3	100
	Total	31	100	100	

INTERPRETATION: 8

Researcher has depicted that out of 100% (n=31) respondents, n=11 is highly aware of the Total Productive Maintenance Lean Production Method, n=10 is aware of the TPM Production Method, n=11 is neutral about the TPM Production Method and n=1 respondent is not aware and n=1 respondent is not at all aware of the TPM Lean Production Method.

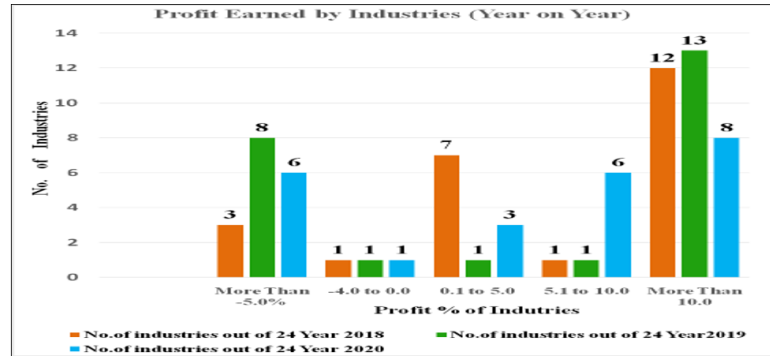
**11. PROFIT OF THE INDUSTRY**

Every industry has main objective as a profit. Different policies rules, regulations are updating and changing for the profit of industries. Workforce always kept trained in view of new project and profit. Work domain may change as per the requirement of the client. Industries always tried to earn more profit than the previous year, which may be affected by several factors. In the current situation, Covid-19 is one of the critical factors which be affect the profit of industries. In the year 2018, four industries are in negative profit slot; in the year 2019 nine industries in negative slot and in the year 2020 seven industries year 2020. When profit is considered every industry trying to increase it compared to the previous year. In the year 2020 only eight industries have a profit greater than 10.0% which is lesser than the year 2019. In the year 2019 thirteen industries have a profit greater 10.0%; means approximately 25% industries profit impacted in the COVID-19 period. Thirteen industries having more than 10% (54.1%) in 2019, but in year 2020 number of industries reduced to eight (33.3%) for 10 % profit margin.

Table 14

Sr. No.	Profit Earned	No. of industries out of 24 Year 2018	No. of industries out of 24 Year 2019	No. of industries out of 24 Year 2020
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1.	More Than -5.00%	3	8	6
2.	-4.0 to 0.0	1	1	1
3.	0.1 to 5.0	7	1	3
4.	5.1 to 10.0	1	1	6
5.	More Than 10.0	12	13	8



12. RELIABILITY TEST

Table 15

Table 15 Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.962	0.962	38

INTERPRETATION:

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered a measure of scale reliability. ... As the average inter-item correlation increases, Cronbach's alpha increases as well (holding the number of items constant).

Reliability test was found to be 0.962 for all the 38 items of awareness level.

13. RESULTS AND FINDINGS

The collected information from Automobile Industries present lean production control in largescale industries reflects; Manufacturing industries located mostly in five locations of Pune City, most of them are subsidiaries of big Giants players in the markets. Most of the industries are in Forging, Pharma, Information Technology, Engineering and Services domain. CEO changeover in recent two years with five industries. Revenue of industries collectively decreased from the year 2019 to 2020, which is indicated by decreasing number of industries in revenue performance. 16.6 % of industries having negative revenue performance in the 2019 which increase to 33.3% in the year 2020, which clearly indicates impact of Covid-19 on Automobile industries. The number of industries reduced from the slot of more than 10% Profit margin, which is approximately around 54.2 % to 33.3%. Though the profit margin, which lies in the negative slot, comes in positive are in 2020 than in 2019. But less than 10% profit margin never indicates supportive mark for industries.

14. DISCUSSIONS AND SUGGESTIONS

This study contributes to verify the general and economic situation of Automobile Industries of Present Production Control and Impact on Industries in Pune. This paper discusses about the location of the industry in the Pune Zone, the industry-working domain discussed on which they are working, and number of Industries selected in the study. Working tenure of CEO with industries also checked for year base time. Revenue and profit of the organization analysed with respect to the previous three years. Many of the industry declared their revenue and profit/operating margin /operating income in the Millions or Billions of USD, Millions or Billions of Euros, Millions or Billions or Corer of Rupees. For analysing all the digits are converted to the Corer Rupees, where USD is considered as 75 Rs. and Euro is considered as 90 Rs. three-year revenue and profit are taken in to consideration in the analysis of Covid-19 impact on industries.

Social distancing is better prevention for Covid-19, implemented by the at most information technology industries, which resulted in cost saving of infrastructure, transportation, power, canteen.

15. CONCLUSION

All analysis of the collected data from Automobile Industries a study on awareness of the present production control practices in industries in pune zone. Industries reflects; largescale industries is also impacted due to COVID -19, which is globally spread. Revenue of industries collectively decreased from year 2019 to 2020, which are indicated by decreasing number of industries in revenue performance. 25% industries having negative revenue performance in 2019 which increase to 37.5% in year 2020, which clearly indicates impact of Covid-19 on IT industries. Number of Automobile industries earned profit margin more than 10%, decreased from 54.2 % to 33.3%.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

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