

# Identification of Serious Success Factors to Implement Lean Manufacturing in Indian Middle Scale Industries

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**Abstract---** *The MSMEs are acknowledged as the heart of economic development of a country. The MSMEs are struggling a lot to withstand in the globalized market without adopting the pioneering move towards in their work. To increase the efficiency of the organization and eliminate wastes, it is proposed to implement lean manufacturing. It acts as one of the tool to make a company to sustain. To implement this tool, there are lots of problems faced by the companies.*

*Thus the factors which turn as the barriers to implement lean in middle scale manufacturing is recognized through the real time field study with well-defined form and views from the lean advisors. The top 11 serious success issues such as durable management and headship, confrontation to change or institute philosophy, worker faith, services and knowledge, financial abilities, active communication, recital measures, education and training, planning and strategy, thinking growth and customer focus are identified as the barriers to contrivance lean in middle scale industries.*

**Keywords:** MSMEs, Lean manufacturing, Serious success factors.

## 1. INTRODUCTION

In the economical growth of the country, industries plays a major role. Our nation growth is based on industries. In the whole world India stands at top 10 position in outputs. In case of developing and developed countries, the presence of MSMEs is unavoidable. In reality, the globalization made lot of impact on the growth of these industries. Hence to sustain in the global market, MSMEs has to implement new tools to improve its performance. In such situation, a tool called lean manufacturing will help the industries to reduce waste and improve the efficiency. The middle and minor scale industries are besieged a portion to stand in the world market without having consciousness on lean manufacturing.

The major problems associated with the lean implementation practice are generally ignored in real time situations. (S.Gunasekharan, *et al*, 2014).

## 2. REPUTATION OF THE COST REDUCTION

The value is the quantity of payment or compensation given by one party to another in reoccurrence for goods or services (Fullerton, Rosemary R., and William F. Wempe, 2009).

## 3. RELATION BETWEEN PRODUCTIVITY AND COST

At this scenario productivity is getting importance in reducing cost. Productivity is a term used to measure the efficiency of production. It is obvious that it can be amplified by either increasing output keeping input constant or reducing the input keeping output constant. The productivity can be improved or input can be condensed by means of sinking the “waste”.

The profitability can be improved by means of eliminating the waste (Swink, Morgan, 2005). Waste is defined as non-value added activities, adding no worth to the product, but incur cost results in an augment in the price. Therefore when waste reduces cost also reduces. Many investigations are carried out in this means of reducing wastes.. To reduce the waste by applying the lean idea in industries is conferred in the succeeding sections (Rose *et al.*, 2009; Upadhye *et al.*, 2010).

## 4. INTRODUCTION TO LEAN MANUFACTURING

The systematic process to eliminate waste (muda) is known as lean manufacturing (Upadhye *et al.*, 2010; Ping-yu, Yang, 2009). Lean considers overburden (muri) and uneven workloads (mura) as the source of waste (Shah, Rachna, and Peter T. Ward, 2007).

## 5. TYPES OF WASTES

The seven types of wastes are defined in this section as shown in figure 1.

- **Overproduction:** The excess manufacturing of products in advance will lead to waste of space, time and money is known as overproduction.
- **Waiting:** The flow of operation should be continuous and it should not wait to complete another process.
- **Transportation:** The unnecessary transport of a product within the manufacturing process is expensive and deteriorates the product.
- **Inventory:** The excess storage and maintenance of inventory will lead to inventory waste.
- **Over Processing:** Extra process to carry out a simple work.

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- *Motion*: The unnecessary movement of the workers to perform a prescribed task. The work place design should consider the ergonomics.
- *Defects*: Identification of defects leads to waste of time and money.



Figure 1 Types of wastes

### 6. ELIMINATION OF WASTE FOR COST REDUCTION

To acquire profit continuously, it is mandatory to concentrate on cost reduction techniques. The cost reduction can be done by controlling surplus production, sales in correct time and waste elimination. (Achanga, P., *et al.*, 2005; Diaz-Elsayed, Nancy, *et al.*, 2013)

In addition to the above, the cost reduction can be done starting from designing to sales (Cezar Lucato and Wagner, 2014; Fullerton, Rosemary R *et al.*, 2003). The identification of waste and its elimination are one of the intentions of lean manufacturing. The waste can be identified by observing employees and equipment in the normal production line (Bhasin, Sanjay, and Peter Burcher, 2006). The thorough elimination of waste leads to greater employee self-respect and to major cost reductions by preventing unneeded losses (Browning, Tyson R., and Ralph D. Heath, 2009).

### 7. INVESTIGATION ON FINDING THE OBSTACLE IN LEAN IMPLEMENTATION

The greatest significant determination of the investigation is to identify the serious success factors which act as the barriers for lean implementation in middle scale industries. It is investigated among the owners and managers of the middle scale industry. The investigation is carried through self-completed form because of its advantages like fewer expensive, less time consuming, same questions thrown to all participants (S.Gunasekharan, *et al.*, 2014, Eswaramoorthi *et al.*, 2011; Nordin *et al.*, 2010). It comprises twenty serious success issues with 65 questions under five captions such as,

- Waste elimination
- Material flow
- Quality
- Implementation and
- Satisfaction with lean

The pilot test is steered with 5 defendants from local middle scale industries to confirm the investigation instruments are laid-back to understand by the defendants (Moneim M, Abdel, 2009; Gunasekaran, A, 2000). Modifications of the questions are done upon the experts' advice. The convenience sampling method is used for this exploratory study. It helps to gather the data quickly.

The data have planned in the form of cross formulation to recognize the main problem from the given issues as shown in Table 1. The measures of central tendency provide the major idea. Therefore the central tendency is found by mean, median and mode. It indicates the measures of

Administrative issues play the vital role in Indian markets and the management issues becomes the negligible one. Thus, it is observed that the lean subjects show the roles in the succeeding direction: Organisational issues, Supplier issues, Customer issues, Employee issues, Management issues. It demonstrates that the administrative matter plays the key character and the management problem has the few importance. Finally the collected data has been analyzed using IBM SPSS package is shown in Table 2.

Table 1. Descriptive Analysis by using SPSS

Lean Implementation Issues	N	Mean	Median	Standard Deviation	Standard Error of Mean	Range	Variance	Skewness	Kurtosis
High Inventory	82	4.1098	4.000	0.3145	0.0347	1.00	0.099	2.544	4.581
High Rejection rate	82	3.8293	4.000	0.49203	0.05434	3.00	0.242	-1.652	4.118
Thinking Development	82	3.7317	4.000	0.58897	0.06504	2.00	0.347	-2.094	3.202
High contract labors	82	3.0122	3.000	0.11043	0.01220	1.00	0.012	9.055	82.000
High set up time or High change over time	82	3.8171	4.0000	0.50008	0.05522	3.00	0.250	-1.556	3.601
Planning and Strategy	82	4.2073	4.0000	0.40788	0.04504	1.00	0.166	1.471	0.167
Customer Focus	82	3.1463	3.0000	0.35562	0.03927	1.00	0.126	2.039	2.209
Performance Measures	82	2.8780	3.0000	0.32924	0.03636	1.00	0.108	-2.354	3.629
Financial Capabilities	82	2.9756	3.0000	0.22086	0.02439	2.00	0.049	-2.008	18.224
Skills and Expertise	82	3.1220	3.0000	0.32924	0.03636	1.00	0.108	2.354	3.629
Strong management and leadership	82	2.9268	3.0000	0.30552	0.03374	2.00	0.093	-1.912	6.794
Quality consciousness	82	2.7317	3.0000	0.44580	0.04923	1.00	0.199	-1.066	-0.887



Education and Training	82	2.1220	2.0000	0.32924	0.03636	1.00	0.108	2.354	3.629
High Response time	82	3.9756	4.0000	0.15521	0.01714	1.00	0.024	-6.282	38.399
To reduce rejection rate	82	3.2439	3.0000	0.43208	0.04771	1.00	0.187	1.215	-0.537
To reduce cost	82	3.4390	3.0000	0.49932	0.05514	1.00	0.249	0.250	-1.986
To reduce delivery time	82	3.0122	3.0000	0.11043	0.01220	1.00	0.012	9.055	82.000
Effective Communication	82	4.0244	4.0000	0.27106	0.02993	2.00	0.073	0.993	11.235
High lead time	82	3.8171	4.0000	0.50008	0.05522	3.00	0.250	-1.556	3.601
Unreliable Transport	82	3.7317	4.0000	0.58897	0.06504	2.00	0.347	-2.094	3.202
High competitions	82	3.9268	4.0000	0.26202	0.02894	1.00	0.069	-3.339	9.380
Frequent changes in supply	82	3.0122	3.0000	0.11043	0.01220	1.00	0.012	9.055	82.000
Lack of job security	82	3.2073	3.0000	0.40788	0.04504	1.00	0.166	1.471	0.167
Employee trust	82	2.8171	3.0000	0.38899	0.04296	1.00	0.151	-1.671	0.811
High customer pressure	82	2.9390	3.0000	0.32764	0.03618	2.00	0.107	-1.220	6.090
Lack of knowledge	82	3.2439	3.0000	0.43208	0.04771	1.00	0.187	1.215	-0.537
Resistance to Change or Organization Culture	82	4.5488	5.0000	0.50068	0.05529	1.00	0.251	-0.200	-2.010
To reduce bought out products	82	2.6829	3.0000	0.46820	0.05170	1.00	0.219	-.801	-1.393
To reduce the gap between requirement availability of manpower	82	2.5976	3.0000	0.49341	0.05449	1.00	0.243	-.405	-1.882
Total	2378	3.3389	3.0000	0.68668	0.01408	3.00	0.472	0.078	-0.194

Based on the opinion from lean consultants, the 29 serious success factors are listed in descending order as shown in Table 3 and top 11 are considered for future analysis .

**Table 2 Order of Lean Implementation Issues based on opinion from Lean Consultants**

Sl. No.	Lean Implementation Issues	Mean
1	Resistance to Change or Organization Culture	9
2	Education and Training	8.667
3	Customer Focus	8
4	Planning and strategy	7.6667
5	Skills and Expertise	6.667
6	Strong management and leadership	6
7	Employee trust	5.667
8	Financial Capabilities	5.33
9	Effective Communication	5.33
10	Thinking Development	4.6667
11	Performance Measures	4
12	High Inventory	3.667
13	To reduce cost	3.333
14	Quality consciousness	3
15	To reduce delivery time	3
16	High competitions	3
17	High Rejection rate	2.667
18	To reduce rejection rate	2.667
19	Frequent changes in supply	2.667
20	Lack of job security	2.667
21	Lack of knowledge	2.667
22	High contract labors	2.3333
23	High Response time	2.333
24	Unreliable Transport	2.333
25	High customer pressure	2.333
26	To reduce bought out products	2.333
27	High set up time/ High change over time	2
28	High lead time	2
29	To reduce the gap between requirement availability of manpower	2

## 8. RESULTS AND DISCUSSION

In above conversation, the 11 serious success factors are identified for executing lean in middle scale productions. Those 11 factors are shown in Table 4.

**Table 3 List of Serious Success Features**

Sl. No.	Serious Success Factors
1	Effective Communication
2	Resistance to Change or Organization Culture
3	Customer Focus
4	Skills and Expertise
5	Financial Capabilities
6	Strong Management and Leadership
7	Performance Measures
8	Thinking Development
9	Planning and Strategy
10	Education and Training
11	Employee Trust

## 9. CONCLUSION

In this exertion application of lean manufacturing in middle scale industries is planned to mend the efficiency of the industry. We have identified the factors as barriers in implementing lean production in middle scale industries through consultants In which, 29 serious success factors are included in 65 questions under five headings for the investigation. IBM SPSS software is used to legalize the study data due to its obvious rewards in data analysis. Based on the analysis by SPSS and the outlook given by lean consultants the twenty nine success factors are arranged descending. The upper 11 serious success factors are identified as the barriers of lean implementation in middle scale industries.



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