

## **CHALLENGES IN IMPLEMENTATION OF LEAN MANAGEMENT IN INDIAN MSMEs – A STUDY**

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### **ABSTRACT**

*Lean Management system is acknowledged as innovative, creative and capable system, which helps in improving organisational performance by concentrating on elimination of wastages from the manufacturing system and thus improving productivity, reducing defects, reducing inventory cost and more, by MSMEs. Even now, many Indian MSMEs are using Lean as improvement tool instead of adopting it as an organisational culture. If implemented on full scale as a culture in the organisation, it can reap a very significant improvement in organisational performance. This paper has attempted to explore the key challenges and classifying each challenges into appropriate categories, then providing constructive suggestions in extensive implementation of Lean in Indian MSMEs.*

**Keywords:** Lean; Challenges in Lean management implementation; Indian MSMEs.

## **INTRODUCTION:**

With the publication of “The Machine that Changed the World: The Story of Lean Production” (Womack, Jones, & Roos 1990), the advantages of lean principles has been widely recognized. The term Lean implies a series of tools and techniques to eliminate wastes (Muda), reduce non-value added operations, improve value added processes and maximize performance (Womack & Jones, 1996). Lean principles emphasizes on system-level optimization, where the emphasis is on integration and how the parts work together as a whole in the organisation, rather than on individual performance and excellence of any one feature or element (Oliver, Schab, & Holweg, 2007). Originally derived from manufacturing industry, these principles have subsequently been applied to service industry (Cuatrecasas, 2004; Vlachos & Bogdanovic, 2013; Womack, 2004). Although Lean is widely regarded as a business strategy and implementation of lean techniques improves business competitiveness and organizational performance, few researchers have concentrated on the validation of its positive link with business performance (Detty & Yingling, 2000; Li, Sawhne, & Wilck, 2013).

Lean concept originated from Toyota, world-renowned automobile manufacturing company after they visited Ford in 1900s and they termed it as TPS (Toyota Production System), identified and reduced eight types of wastes (Muda).

“The most dangerous kind of waste is the waste we do not recognize” (Shigeo Shingo) this was the only reason where even during world oil crisis Toyota’s profitability was unchanged. Later in 1940s, looking at the success rate of Toyota many European and American Companies started to adopt them in their production systems but very few were successful and could actually get the real fruit out of it. Later on, most of the automobile manufacturing companies in developed nations accepted this lean concept and successfully adopted it.

This concept was more popularised after World War II, which resulted in scarcity of resources, less work force, lack of capital and other reasons. Alternatives or change of things happen only when there is crisis, one such concept is Lean which played a major role in making Toyota the great automobile company in the world. Lean management is a managerial approach focused on improving customer value (quality), through the elimination of non-value added steps from work processes (van Dun, Hicks, & Wilderom, 2016). To sustain in the market, all the organisations have to change their system there is no other way, but few say that traditional method is best method.

Lean Management is a system of production, which consumes very less resources to achieve the same amount of output, which is better in terms of quality and satisfy the needs of customers (Mishra O.P., Kumar V. Garg D.,2013). Lean Management is a set of tools and techniques which aim to create a customer centric organization by developing and adopting best manufacturing practices with the involvement of all level of employees(Kumar & Kumar, 2014).

## **OBJECTIVES OF LEAN:**

The Lean objectives are to improve productivity and reduce production cost.

Following are Lean objectives:

- Labour productivity improvement - Getting better work productivity by eliminating or by reducing unintentional wastage of time.
- Reducing lead Times - Lowering cycle times and reducing production lead time by applying Lean tools to reduce production cycle.
- Inventory Reduction – identifies that reducing inventories between production department is essential to reduce inventory cost and working capital requirement.
- Defects Reduction – Reduction of defects by applying Lean tools resulting in reduced raw material requirement and reduced customer complaints about defects of product.
- Increased production – Production is increased by reducing cycle time and manufacturing defects.
- Better Flexibility - Capability to manufacture wider range of products with reduced time.
- Improved equipment Utilization – Equipment are utilized efficiently by eliminating bottlenecks in manufacturing (Kumar & Kumar, 2014)

In simple words, Lean is just applying common sense and using presence of mind in all the process of the organisation.

Indian MSME's are an integral part of Indian economy. The contribution to the economic development of the country is indeed significant, due to liberalization and globalization; Indian MSME's are facing tremendous challenges. Imports, especially from china and MNCs are becoming major threats to Indian industries. For many industries abroad, Lean thinking is a way of life. But in India Lean implementation is still in its early stages. LM have-not received due attention in MSME's globally (Gunasekaran, A.,L. Forker and B.Kobu, 2000).

Indian government has also started focusing on MSMEs through cluster formation to implement Lean. Many issues in MSMEs made them to delay in implementing Lean techniques. Many MSMEs have failed to implement Lean successfully. These MSMEs, who started implementing Lean in piecemeal, found it difficult to implement. In order to implement Lean successfully, it is necessary to identify various challenges faced by them while implementing Lean tools (Ravikumar, Marimuthu, Parthiban, & Zubar, 2014).

This paper deals with identifying challenges in implementation of lean in Indian MSMEs and attempts were made to provide realistic solutions to overcome major barriers identified, for successful implementation of Lean.

## **REVIEW OF LITERATURE:**

Manufacturing has been recognized as the substantial driver for development of the economy. With the spread of globalization, India is become a global manufacturing hub and at the same time scope of Lean Management implementation is turning out to be wider in Indian situation. Many companies in India are now feeling the warmth of global competition and this has motivated them to take serious step forward towards adoption of Lean Manufacturing (Singh B., Garg S.K., Sharma S.K., 2010). Frequently fluctuating customer demand and international environment has been putting forward challenge of survival and competitiveness to all the element of the financial system (Upadhayay N, Deshmukh S. G. and Garg S., 2010).

Manufacturers in the Indian industry have always faced discriminating challenges such as increasing customer's expectation, demand variation, and competition in markets (Khadse Priti B., Sarode Avinash D. and Wasu Renu 2013).

(Mishra O.P., Kumar V. Garg D., 2013) describes Lean Manufacturing as a system, which consumes lesser resources to achieve the same output, which is better in terms of quality and satisfy the needs of customers. Lean Management system is set of tools and techniques that primarily aims to make a customer centric organization by developing and adopting best manufacturing practices with the participation of all level of employees.

(Vikas K., Garg D and Mehta N.P., 2004) explains that adoption of continuous improvement methodology with the use of different tools and techniques becomes the strength of the manufacturing system. Researchers and practitioner has developed many tools and techniques to improve manufacturing from different ways and means.

Idea behind Lean Management is to reduce production lead-time, cost, reduce inventories and improve quality in the manufacturing system as stated by (Mishra O.P., Kumar V. Garg D., 2013). This is achieved by identifying and eliminating of waste existing in the organisation. Global managers classify that Lean Management is a set of straightforward management tools and systems, and in fact it is a complex plan that Toyota has established all the way through enduring organizational culture and continuous improvement (Shah R a, Ward Peter T., 2003). Lean Management can bring large scale changes in the organisation but cannot be put into practice immediately. To implement Lean Manufacturing system, it must have a clear and careful planning, staff must have full understanding of concept and senior management must plan and execute firmly keeping the employees motivated as stated by (Pingyu Y. and Yu yu, 2010).

**OBJECTIVES OF THE STUDY:**

1. To understand tools and techniques adopted in lean management.
2. To know whether the lean management helps to improve productivity and reduction in cost.
3. To identify the major challenges in implementation of Lean management in Indian MSMEs.

**RESEARCH METHODOLOGY ADOPTED IN THE STUDY:**

From the above review of literature, it is clear that very few researches has been done pertaining to study of challenges in implementation of Lean. Current study is conceptual in nature and all the data collected for analysis is from secondary sources (ie: books, journals, magazines, portals)

Scope of the Study: This present study confines only with challenges faced by Indian MSMEs in implementation of Lean management.

**Objective 01: To understand tools and techniques adopted in lean management.**

**Various Lean techniques available (Vorne, 2017)**

5S	KPIs (Key Performance Indicators)
Andon	Muda (Waste)
Bottleneck Analysis	Overall Equipment Effectiveness (OEE)
Continuous Flow	Plan Do Check and Act (PDCA)
Gemba (The Real Place)	Poka-Yoke (Error Proofing)
Heijunka (Level Scheduling)	Root Cause Analysis
Hoshin Kanri (Policy Deployment)	Single-Minute Exchange of Dies (SMED)
Jidoka (Automation)	Total Productive Maintenance (TPM)
Just In Time (JIT)	Value Stream Mapping
Kaizen (Continuous Improvement)	Visual Factory
Kanban (Pull-System)	

Source:<http://www.leanproduction.com/top-25-lean-tools.html>

**5S**

Is all about organizing the work area:

- Sort (eliminate which is not required)
- Set In Order (organize items)
- Shine (clean work area)
- Standardize (standards for above)
- Sustain

This will help in Eliminating waste those results from a poorly organized work area (e.g. wasting time looking for a tool).

**Andon:**

Is a visual feedback system for the shop floor that indicates production status, signals when assistance is required, and authorizes operators to stop the production. It acts as a real time communication tool for the shop floor that conveys immediate attention to problems as they occur, so that it can be immediately addressed.

**Bottleneck Analysis:**

Identifies which part of the manufacturing process limits the complete throughput and improve the performance of that part of the process. It will improve the throughput by consolidation the weakest link in the manufacturing process.

**Continuous Flow:**

Manufacturing where work-in-process easily flows through production with minimal (or no) barriers between steps of the manufacturing process. It eliminates many forms of wastes (e.g. inventory, waiting time, and transport).

**Gemba (The Real Place):**

A philosophy that prompts us to get out of our offices and spend some time on the shop floor – the place where real action occur. It stimulates a deep and thorough understanding of real world manufacturing issues – by first hand observation and by conversation with plant floor employees.

**Heijunka (Level Scheduling):**

A system of production scheduling that deliberately manufactures in smaller batches by sequencing (mixing) product alternatives within the same process. It Reduces lead time (since each product or variant is manufactured often) and inventory (since batches are smaller).

**Hoshin Kanri (Policy Deployment):**

Aligning the goals of the company (Strategy), with the plans of middle management (Tactics) and the work performed on the plant floor (Action). It Ensures that progress towards strategic goals is consistent and thorough – eliminating the wastes that originates from poor communication and inconsistent direction.

**Jidoka (Automation):**

Design equipment's to partially automate the manufacturing process (partial automation is much less expensive than complete automation) and to stop automatically when defects are detected. After Jidoka, workers can regularly monitor multiple stations (reducing labour costs) and many quality issues can be addressed immediately (improving quality).

**Just In Time (JIT):**

Pull parts through production based on demand from customer instead of pushing parts through production based on demand projected. Depend on various lean tools such as Heijunka, Takt Time, Continuous Flow, Standardized Work and Kanban. It is highly effective in reducing inventory levels. Improves cash flow and reduces space requirements.

**Kaizen (Continuous Improvement):**

Is a strategy where employees work together in proactive manner to achieve regular, sustainable and incremental improvements in the manufacturing processes. It combines the collective talents of a company to create an engine that will continually eliminate waste from manufacturing processes.

**Kanban (Pull-System):**

A method, which regulates flow of goods both within the factory, with outside suppliers and customers. Based on automatic replacement through signal cards that indicate when more goods are required. It Eliminates waste from inventory and overproduction. Can also eliminate the need for physical inventories (instead relying on signal cards to indicate when more goods need to be ordered).

**KPIs (Key Performance Indicators):**

Metrics are designed to track and encourage progress towards critical goals of the organization. Strongly endorsed KPIs can be extremely powerful drivers of behaviour – so it is important to carefully select KPIs that will drive desired behaviour.

The best manufacturing KPIs are:

- Aligned with strategic goals framed by top-level (thus helping to achieve those goals)
- Effective at exposing and quantifying waste (Example OEE)
- Influenced by plant floor employees (so they can drive results)

**Muda (Waste):**

Anything in the manufacturing process, that does not add value from the customer's perspective. Muda means 'waste'. The elimination of wastage i.e., Muda is the primary focus of lean manufacturing.

**Overall Equipment Effectiveness (OEE):**

Framework for determining productivity loss for a specified manufacturing process. Three classes of loss are tracked:

1. Availability (e.g. down time)
2. Performance (e.g. slow cycles)
3. Quality (e.g. rejects)

It provides a benchmark and a means that tracks progress in eliminating wastes from a manufacturing process. 100% OEE means faultless production (manufacture of only good parts, as fast as possible, with no down time).

**Plan Do Check and Act (PDCA):**

An iterative practice for implementation of improvements:

- Plan (establish strategy and expected outcomes)
- Do (implement plan)
- Check (verify expected results achieved)
- Act (review and assess; do it again)

It applies a scientific approach in making improvements:

- Plan (develop a hypothesis)
- Do (run experiment)
- Check (evaluate results)
- Act (refine your experiment; try again)

**Poka-Yoke (Error Proofing):**

Design error detection, and prevention into production processes with the goal of achieving zero defects. It is not a very simple task in identifying all defects through inspection, and correcting defects typically gets significantly more expensive at each stage of production. Hence, Poka-Yoke will be helpful in this regard, where each product is checked in all the process before going to further process.

**Root Cause Analysis:**

A problem solving methodology that primarily focuses on resolving the underlying problem instead of applying readymade solutions that only treat immediate symptoms of the problem. A usual approach is to ask why five times – each time moving a step closer to discovering the true underlying problem. It ensures that a problem is eliminated by applying corrective action to the “root cause” of the problem.

**Single-Minute Exchange of Dies (SMED):**

Reduce setup (changeover) time to less than 10 minutes. Techniques include:

- Convert setup steps to be external (performed while the process is running)
- Simplify internal setup (e.g. replace bolts with knobs and levers)
- Eliminates non-essential steps or operations
- Creates Standardized Work instructions and enables manufacturing in smaller lots, reduces inventory, and improves customer responsiveness.

**Total Productive Maintenance (TPM):**

A holistic approach in maintenance that focuses on proactive and preventative maintenance to take full advantage of the operational time of equipment. TPM shapes the difference between maintenance and production by placing a strong emphasis on empowering operators to help maintain their equipment. It creates a shared responsibility for equipment that encourages greater involvement by shop floor workers. In the right environment, this can be very effective in improving productivity (increasing up time, reducing cycle times, and eliminating defects).

**Value Stream Mapping:**

A tool, which is used to visually map the flow of production. Shows the current and future (FSVS/VSD) state of processes in a way that highlights opportunities for improvement. It Exposes wastes in the current processes and provides a roadmap for improvement through the future state.

**Visual Factory:**

A tool similar to Andon but this uses visual indicators, displays and controls used throughout the manufacturing plant to improve communication of any information. It makes the state and condition of manufacturing processes easily accessible and very clear to everyone.

**Objective 02: To know whether the lean management helps to improve productivity and reduction in cost.**

Can Lean management increase productivity in the organization?

The following case study will reveal the answer for this.

Case study of Bosch Ltd, Bangalore Plant with special reference to components of CRP (Nagesh S, NVR Naidu, 2015). The author has explained the condition before and after implementation of lean for one particular process under CRP, the results after implementation of lean are, proposed closed loop control pull production system with kanban to the value stream, the total lead times for the components of CRP

were reduced by a considerable margin. The Work-In-Process levels were decreased in the wake of introducing FIFO in between workstations. Introduction of Kanban system facilitates the automatic functioning of the loop i.e, the operators need not be informed how much to produce and which product type to produce. This is due to, all the information is available in the Kanban cards and hence no manual interference is required for this purpose. The maximum and minimum quantity of components in the market (finished goods section) was defined, which keeps the inventory level in check. Due to reduction in lead times, the percentage time saved in production for cylinder head, eccentric shaft and housing is 20.6%, 25.1% and 98% respectively. The reduction in WIP levels also saved floor space on the shop floor. The above case study is clear evident which has clearly explained, how lean has increase the production, reduced time of production and many more.

When it comes to reduction in cost, the following case study will help to understand how lean can reduce cost and increase productivity:

National Textiles initiated their lean manufacturing implementation process in 2004 with the help of NC State University's (NCSU's) Industrial Extension Service (IES) lean architects. The company's goal was to reduce wastage and increase productivity (NCSU IES 2007). Their initial lean event yielded remarkable results; including 30% enhancement in productivity and 40%, reduction on cost in that production range (NCSU IES 2007). The project implemented tools such as 5s, standard work and flow. The goal of the second lean event was to increase throughput and flow between two processes. To accomplish this goal, the project conducted 5s activities, calculated cycle time and takt time and conducted a VSM exercise. The outcome was reduction in the number of needless set ups by 50% and a reduction of the set up time from 15 mins to 5 min (NCSU IES 2007).

**Objective 03:**

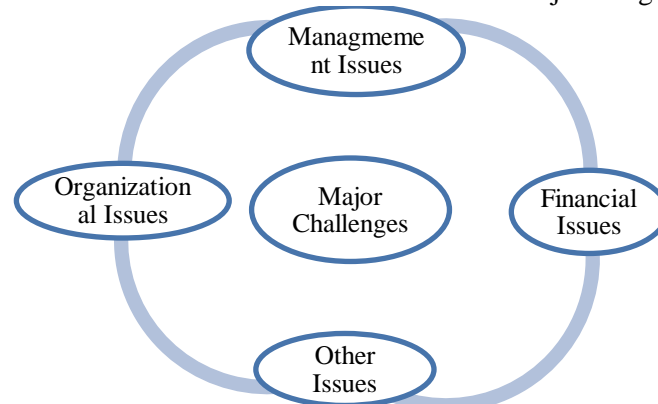
**To identify the major challenges in implementation of Lean management in Indian MSMEs**

Challenges in Lean management implementation in Indian Context-

The purpose of Lean management is to support the business goals. It asks for the change from traditional process of working to a method that motivates business excellence practice. This all requires big changes to happen within the organisation system; starting from change of management thought process, balanced deployment of resources, allocation of funds, training of staff and so on.

According to previous studies, a variety of challenges in implementation of Lean management has been discussed. Some of them are related closely to technical, cultural, organizational and economic factors to the implementation of Lean management in companies. Even though Lean management is an established structure for improving the organization in all aspects but still most of the MSMEs faces more complications in implementation of Lean management. Lean production has been in India for more than twenty years but only a countable number of companies have successfully adopted Lean and are able to make considerable success out of it.

The intention of this paper is to observe the challenges and ascertain ways for effective implementation of Lean based on the study in the Indian MSMEs. Top-level management issues for lean implementation is also very important and top-level management policies and attitude towards lean implementation need some improvement in Indian industries (Singh B., Garg S.K., Sharma S.K, 2010). Individual challenges of Lean implementation has been identified and classified into four major categories



- A. Management issues
- B. Organizational issues
- C. Finance issues
- D. Other issues

**A. Under Management issues, challenges of lean implementation are:**

1. Lack Of Management Focus
2. Lack Of Management Support
3. Lack Of Capital Fund
4. Lack Of Implementation of Know-How
5. Lack Of Long Term Vision
6. Past Experience Of Failure
7. Lack Of Need To Create Sense Of Urgency

**B. Under Organizational issues**

1. Lack Of Labour Resources
2. Company Culture
3. Lack Of Innovative Ideas
4. Lack Of Communication
5. Lack Of Time
6. Lack Of Training
7. Lack Of Understanding About Lean
8. Clashes With Other Initiatives Like TQM, TPM, JIT
9. Different Manufacturing Environments

**C. Finance issues**

1. Perceiving lean will cost more and is largescale companies
2. No financial targets and sliding back to former state in the absence of staying power.
3. No Immediate Financial Advantage
4. Not Recognizing Financial Benefits

**D. Other issues**

1. Unstable Demand
2. Conflicts With ERP Implementations
3. Middle Management Resistance
4. Employees Resistant To Change

**FINDINGS:**

1. Lean consists of various tools and techniques, which is related to reducing non-value added processes and improving quality of the product. Hence, it plays a dual role.
2. As lean implementation in MSME is rare but it has many benefits as stated, even then very few MSME go for Lean implementation (advantages of lean implementation in view of organisation and management) compare with foreign countries.
3. Lean tools and techniques are not meant only for large scale manufacturing which is the basic assumption of all industries. But this assumption is not true as lean is an creative tool which is best suited for all industries irrespective of their scale of operations.
4. It is clear evident from the case studies that Lean management reduces lead-time and in turn helps to increase production, with this and reduce lead-time and while initial lean event yielded remarkable results including 30% enhancement in productivity and 40%, reduction on cost in that production range.
- 5.



6. Challenges of Lean implementation has been identified and classified into four major categories: Management issues, Organizational issues, Finance issues, Other issues. Challenges are closely related to technical, cultural, organizational and economic factors to the implementation of Lean management in companies.

### **SUGGESTIONS:**

Implementation of lean is not a cup of tea for Indian MSMEs; they start their plant with the aim of earning profit, which is the basic goal of all the Industries. However, MSMEs in India are not financially sound and always try to go ahead with traditional methods in manufacturing, even though Government supports them with financial aids and provides Lean training at concessional fee. The following are the constructive suggestions to overcome the challenges in implementation of Lean.

1. Lack of finance is a major challenge for Indian MSMEs, as they start up their enterprises with very less initial capital. But for implementation of lean it needed not have to pour in more amount initially, like 5S, Poka yoke etc.
2. Lack of support from employees can be addressed through awareness drive about what is lean and how lean will help to achieve their individual goals and organisational goals at large. In this drive it must clearly state that in implementation of lean will not lead to job cuts nor decrease the salary, but main aim is to retain only those processes which adds value and eliminating non-value added activities (wastes) in the Industry.
3. Intensive training by professional lean practitioner is necessary in order to implement lean in very effective manner, initial this training should concentrate management level employees in the Industries then employees should train their own staffs under them. Same flow must be followed until they reach low level employees, ensure that all the employees in the Industry is covered.
4. Frequent training sessions about the new practices adopted under the lean management must be provided time to time so that employees are aware of the prevailing tools and techniques.
5. Lean management will surely increase production, through its tools and techniques if adopted in well-defined manner, along with advice from the experts in the field of Lean.

### **CONCLUSIONS:**

Lean has become a way of life for all the manufacturing and service industries in the world India is not an exception. This paper has discussed all the major challenges faced in implementation of lean in Indian MSMEs that was identified through intensive review of literature. The challenges defined in this paper are addressed when lean is realized as a holistic approach that extends beyond the manufacturing processes. With the consciousness of challenges and the capability of overcoming them with the help of building organisational culture of persistent improvement and elimination of wastes, should serve as encouraging conditions for implementation of lean management and its further development into company's overall philosophy. Managers considering the implementation of lean management principles in their organizations should always focus on ensuring that the organisation sees the adoption of lean management as a long-term investment.

### **DIRECTION FOR FUTURE STUDY:**

This paper is conceptual in nature and all relevant data collected is from secondary sources. This same study can be carried on with primary data.

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