ENHANCING THE COMPETITIVENESS OF INDIAN MSMES THROUGH LEAN MANUFACTURING

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Abstract

The MSMEs are vital part of our country. They meet the demands of domestic as well as international market. However, the changing globalised environment causes various challenges for the survival of Indian MSMEs. In order to transform our MSME sector into a global leader in manufacturing, overall competitiveness of the MSMEs should be enhanced. This can be achieved by implementing Lean manufacturing in the business. Applying lean practices helps to identify and eliminate all kinds of wastages in a production system and thereby can achieve cost reduction and quality improvement. Realising the importance of lean, the ministry of MSME has launched Manufacturing Competitiveness Lean Scheme (MCLS) for motivating the MSMEs to adopt lean manufacturing. The present study provides an overview of lean manufacturing concepts and tools for business men and researchers and provides a general understanding on the Manufacturing Competitiveness Lean Scheme (MCLS).

Key words:- Lean manufacturing, Micro Small and Medium Enterprises, Manufacturing Competitiveness Lean Scheme.

Lean production, also known as the Toyota Production System, means doing more with—less time, less space, less human effort, less machinery, less materials—while giving customers what they want(Dennis, 2015). The ultimate objective of Lean Production or Lean Manufacturing (LM) is to remove waste (MUDA) in the production process. Waste here means any activity which does not add value to the production process or simply termed as non-value-added activities.

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Lean tools are proven methodology and its application in the business will results in decrease in waste, an increase in productivity, the implementation of excellent management practices, and the adoption of continuous improvement. Thus, the essence of the lean philosophy is to meet the customer demand using minimum resources. Implementing Lean manufacturing helps an enterprise to reduce wastage, reduce manufacturing time, better utilization of space, cost reduction, improved quality, and thereby can attain satisfied customers. By applying lean the cost of manufacturing can be cut down and the enterprise can become more profitable.

Lean manufacturing implementation is not a one-time process, and rapid success cannot be expected. Continuous improvements and maintenance of the lean practices is essential for successful lean transformation. Active participation of employees and commitment from the management is necessary for the successful implementation of lean. Lean implementation is not a new thing for the large enterprises whereas the case of SMEs is different. Changing the way of doing business is quite difficult for the small enterprises. However, rapid adoption of lean practices by SMEs has become an important determinant of success in the global market (Sahoo & Yadav, 2018). Initiatives from the government to introduce lean in MSMEs show the importance of lean transformation. This paper attempts to provide an understanding on lean manufacturing practices. This is followed by an overview of lean schemes by the ministry of MSME.

2. Significance of the Study

Various studies on lean manufacturing focus on advantages of lean implementation, implementation steps, critical success factors for successful lean implementation, implementation challenges and more. However, most of these research outcomes are based on the lessons learned from large enterprises and the lean adoption in SMEs are not represented enough. In the context of Indian MSMEs, lean implementation is in its early stage and, there is a lack of direction for successful lean transformation. Ministry of MSME had started its attempt to introduce lean concepts in MSMEs from 2009 onwards by implementing Lean Manufacturing Competitiveness Scheme. Success of this scheme shows that lean can make significant impact on MSMEs. The ongoing Manufacturing Competitiveness Lean Scheme is the next hope for attaining global competitiveness. Therefore, this study is useful for providing an understanding on lean concepts and providing an awareness on lean scheme by the MSME ministry.

3. Statement of the Problem

Micro Small and Medium Enterprises (MSMEs) are the backbone of Indian economy. As the name indicates, MSMEs are small in case of financial as well as non-financial resources. Due to high competition from the large enterprises, they are facing challenges and hurdles in their business operations. MSMEs have limited resources such as money, materials, people, time etc. So, they have to find more effective ways to produce goods or services that satisfy the needs

of customers. Lean adoption can be seen as a definitive solution for Indian MSMEs to become competitive and sustain competition from Indian large industries and global players (Kore et al., 2021). By studying previous literatures, it is found that studies on lean promotion by government of India were scarce. Thus, the main aim of this study is to discuss on lean manufacturing concepts and the manufacturing competitiveness lean scheme (MCLS) by the ministry of MSME. This study will provide directions to MSMEs, lean practitioners and researchers regarding lean implementation in Indian MSMEs.

4. Review of Literature

A study conducted by (Nidhin K et al., 2014), within the manufacturing organizations of Kerala focused to find out the current level of Lean practices within the manufacturing organizations in Kerala. They found nine critical success factors which are the key drivers for implementing lean production in SMEs. These are Top management support and commitment, Employee involvement, Supplier involvement, Customer involvement, just in time practices and pull production, Process, Resource reduction and TPM. The medium sized organizations have greater readiness towards lean, as they have more resources and a wider customer community and other marker pressures have forced them to implement at least some quality management practices to become competitive. The small-scale organizations are comparatively less competitive and they ignore the quality management and waste reduction techniques. Understanding and awareness of the benefits and principles of Lean production have been found to be very low, and knowledge of Lean production is missing in SMEs.

(Shrimali& Soni, 2017) conducted a survey on Indian SMEs to identify barriers in lean implementation. Based on the previous studies and on from the survey they have identified some barriers which act as a hindrance for lean implementation. And a hypothesis test is conducted to find out whether there is any significant difference between small and medium sized enterprises related to lean barriers and the results shows that there is a significant difference on the hindrances such as little support from top management, poor lean training and absence of lean implementation team.

Review research by Pandey & Tyagi (2018), points out that training sessions to the employees are very important for successful lean implementation in MSME's. Poor management support, unskilled employee, organizational culture, poor human attitudinal issue, poor leadership etc. are the barriers which affect lean implementation in MSMEs. Understanding these barriers and taking actions to resolve these will helps in reducing failure rate of lean implementation. They also advocate for identifying appropriate action plan and policies for reducing risk in lean implementation.

Matharu & Sinha, (2019), in their study used SAP-LAP framework in order to understand lean practices in manufacturing MSMEs and to find out the problem which are faced by MSME while implementing Lean. MSMEs

participated in the LMCS scheme is taken as a sample. Survey with lean consultants is also done. The results show that Indian MSMEs are facing different hurdles for technology up gradation and improving production process. A major concern for non-adoption of improvement programs was labour-management conflict. Study suggests that lean should be adopted throughout the organisation not only in the lower level. Indian MSMEs often fails in material management and inventory control. So lean is helpful in solving these problems.

A study by Sengupta & Bose (2020), showcase the relevance and applicability of lean manufacturing practices to the MSME's, they suggest that MSME should concentrate on in house elements to implement lean. Tools like 5s, quality units, preventive maintenance, employee involvement are widely used in MSMEs. Thus, lean practices which require less investment and easy implementing are practiced. Flexibility, fewer departmental interfaces, absence of bureaucracy in management, high employee loyalty, rapid implementation of decision, customer demand and informal working relationship are the strength of MSMEs to implement lean. Where absence of standardization, lay off of employees, budget constraints, lack of skill, time and resources and focus on operational matters rather than on planning are the major hurdles for the successful lean implementation. Study suggests that MSME's should practice lean tools to get full benefit.

According to Bhattacharya & Ramachandran, (2021) lean implementation in Indian MSME's in its infancy stage and the Indian MSME's has less level of awareness on lean manufacturing practices. This study is conducted to understand the Lean Manufacturing Competitiveness scheme of the Government of India and its outcome. Study was conducted in 6 MSME cluster. This study put effort to identify the bottlenecks and challenges of MSME units in different sector and find out the lean tools which are used by them to eradicate these problems. Authors also point out that MSME's in each cluster are worried about losing competitiveness because of sharing their unique or secret manufacturing practices. They suggest for further studies to identify various problems and challenges for MSME and to develop a model for lean implementation in MSMEs.

A study by Kumara & Shobharani (2021) tries to understand the major challenges are classified into management issue, organizational issues, financial issues and other issues. The study points out that these challenges are related to technical, cultural, organizational and economic factors. They advocate for implementing less cost lean tools such as 5s and poke yoke etc in MSME and suggest for providing awareness classes and training sessions for employees in MSME's.

According to (Bhadu et al., 2021) conducted a literature study to understand the Critical Success Factors which are important for the SMEs in the Indian ceramic sector. The results revealed that regular training and education for workers, proper selection of lean tools and low rework and elimination of waste are the important factors that should be noticed before lean implementation. Top

management commitment & attitude, organization culture, proper selection of lean tools/techniques, stock or inventory level reduction, customer's satisfaction, low scrap or rework or elimination of waste, regular training and education for workers, increase in flexibility and market share, balanced workload on different workstation etc are the Critical Success Factors identified.

5. Objectives of the Study

1. To provide an overview of lean manufacturing concepts and tools for business men and researchers
2. To provide a general understanding on the Manufacturing Competitiveness Lean Scheme (MCLS).

6. Scope of the Study

The purpose of the present research is to better understand the Lean implementation within the context of Micro, Small, and Medium Enterprises (MSMEs) in India. Through a literature analysis, an effort has been made to present the key aspects of lean manufacturing and an overview of lean promotional schemes by the ministry of MSME.

7. Methodology of the Study

The methodology includes reviewing previous literatures on lean manufacturing in Micro, Small and Medium Enterprises (MSMEs).The present study is descriptive in nature and was used secondary data. Details are obtained from research articles, web articles, published reports, official websites of relevant agencies and books.

8. Discussion

8.1. Lean Manufacturing Practices

Lean has become a worldwide movement. Lean concepts aren't new; the techniques, in various forms, have been practiced in companies large and small around the globe for decades especially in the automobile sector.

(Sayer & Williams, 2007). Lean transformation in an enterprise results in the waste minimisation, reduction in defects, better space utilisation, optimum utilisation of resources, quality improvement, reduction in cost of production, safety in workplace, enhancement of productivity and increase in overall profitability. There are 7 kinds of wastages or non-value-added activities which are to be identified and eliminated throughout the lean journey. There wastages are; unnecessary transport, excess inventory, unnecessary motion (movement), waiting, over production, over processing and defects. One more wastage identified by experts which is unutilised talent of the workers.

Lean manufacturing implementation is a continuous process which requires time, money, energy and commitment from employees as well as management. Lean is based on 5 principles which are:

1. *Identifying Value*: value is what customers really want, and for which he is willing to pay. All activities in a production process have to be categorised to value added and non-value-added activities (wastages).
2. *Map the Value Stream*: Value added and non-value-added activities are

identified and non-value-added activities are eliminated from the value stream.

3. *Create Flow*: Next step is to create a smooth flow of operations by removing bottlenecks in the production process.
4. *Establishing Pull system*: After ensuring a smooth flow of work, a pull system has to be established. Here manufacturing is done at the time they are needed and in just the quantities demanded.
5. *Continuous Improvement*: Continuously improve the production process and remove waste whenever is necessary.

There are hundreds of lean tools are available, the most used tools are listed below;

1. 5S: System for workplace management
2. Value Stream Mapping: Tool used to visually map the flow of production.
3. Visual control: Using visual indicators throughout the manufacturing plant to improve the communication of information.
4. Just in Time: Production method to make the right product in right quantity at the right time.
5. Kanban: Method of regulating the flow of goods both within the factory and with outside suppliers
6. Kaizen: Employees work together for continuous improvement.
7. Poka Yoke: Error detection and prevention in the production processes.
8. Root Cause Analysis: Problem solving methodology that focuses on resolving the underlying problem.
9. Jidoka: Partial automation in the manufacturing process.
10. Heijunka: Production scheduling that purposely manufactures in much smaller batches by sequencing (mixing) product variants within the same process.

8.2. MSMEs in India

MSMEs play a vital role in the growth and development of Indian economy. This sector contributes nearly 30 per cent of India's GDP and contributes 50 per cent of exports. It is an important provider of employment, particularly in underdeveloped and rural regions (approximately employs 113 million people), and this helps to balance out regional disparities. In addition, this sector supports other industries by supplying of raw materials and ancillary goods. The MSME sector functions as a guard for the Indian economy by giving strength to withstand crisis.

According to (*Ministry of Micro, Small and Medium Enterprises Annual Report 2022-23*, 2023), MSMEs are classified under the Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 as below:

i. a micro enterprise, where the investment in plant and machinery or equipment does not exceed one crore rupees and turnover does not exceed five crore rupees;

ii. a small enterprise, where the investment in plant and machinery

or equipment does not exceed ten crore rupees and turnover does not exceed fifty crore rupees; and

iii. a medium enterprise, where the investment in plant and machinery or equipment does not exceed fifty crore rupees and turnover does not exceed two hundred and fifty crore rupees.

Ever changing globalised economy pose various challenges to the MSME sector therefore, there is a need for a transition in this sector.They face threat from the existing competitors as well as from the new entrants in the market. To be able to survive and qualify in such a competitive environment, SMEs should seek for further innovative intelligent manufacturing paradigms (Achanga, 2007).

8.3. Lean Manufacturing promotional Schemes

"Cost reduction without compromising on quality" should be the motto of every manufacturing SMEs to survive in this competitive global economy (Sahoo & Yadav, 2018). Indian MSMEs have started its effort to practice various techniques in their business toincrease their productivity and competitiveness. Ministry of MSME has also taken measures in this regard. One of them is Lean Manufacturing Competitiveness Scheme (LMCS). This programme aims to motivate MSMEs to adopt lean tools and techniques. It was launched in July 2009 as part of National Manufacturing Competitiveness Programme (NMCP). The scheme was implemented in 100 clusters on a pilot basis. Due to the pilot phase's success, the scheme was expanded to 500 additional clusters. National Productivity Council (NPC) was assigned the role of a National Monitoring & Implementing Unit (NMIU) for 280 clusters in the upscaled (revised 2013) phase.

According to (*National Productivity Council Annual Report 2018-19*, 2018), Around 415 Awareness Programmes have been conducted and a total of 239 clusters formed under this scheme which cover 1900 MSMEs from various industries. 80 clusters (covering 670 MSMEs) have completed all the lean milestones and saved Rs. 143.78 crores after implementing lean. The Contribution by Clusters were amounted to Rs. 4.39 Crore whereas, Contribution by Government under LMCS Scheme was amounted to Rs. 17.26.

As per the (*National Productivity Council Annual Report 2018-19*, 2018), Council the MSMEs gained numerous benefits after implementing this scheme.

a. A productivity level of MSMEs has increased in the range of 5 per cent to 25 per cent.

b. MSMEs witnessed average increase in inventory turnover at 25 per cent.

c. A reduction in manufacturing lead time between 5 per cent and 30 per cent.

d. Mini clusters experienced average financial benefits/savings between Rs 30 lakh and Rs 125 lakh, whereas at unit level, the average financial benefits ranged from Rs 15 lakh to Rs 25 lakh.

e. Other advantages include better quality, more efficient production

methods, environment friendly operations, safe work environment, and increased employee morale.

On 10th March, 2023, the Government of India launched a revised version of LMCS called MSME Competitive (LEAN) Scheme under the MSME Champions Program. MSME Champions scheme has been formulated by merging 6 components of erstwhile Credit Linked Capital Subsidy Scheme for Technology Upgradation (CLCSS-TUS). Along with the Manufacturing Competitiveness Lean Scheme, MSME-Sustainable (ZED) scheme and MSME-Innovative (for Incubation, IPR, Design and Digital MSME) scheme are the components of the MSME Champions Scheme. The ultimate goal of this scheme is to assist MSMEs to modernize their operations, waste reduction, enhancing competitiveness, and achieve excellence in their business. This scheme is for a period of 5 years i.e., 2021-22 to 2025-26.

The Ministry of MSME is making a significant effort to improve the MSME sector through the implementation of MSME-Competitive (Lean) scheme. This scheme suggests for implementation of Lean manufacturing Tools and Techniques in the production system of a MSME unit. Lean Scheme is proposed to be implemented in 2 Phases; where the first phase will be focus on Manufacturing MSMEs with UDYAM Registration and in the second phase Service Sector MSMEs will also be included. The first phase will be valid till 31stMarch, 2026.

Every MSME participating under this scheme have to register and generate a lean ID and have to take "Lean Pledge". The scheme has 3 levels which are basic, intermediate and advanced. Duration of completion of basic, intermediate and advanced levels are 2 months, 6 months and 12 months respectively. Basic level is designed as e-learning modules. Simple and easy to implement lean practices such as 5S, Kaizen, Visual Management, Value stream mapping etc are comes under basic level lean implementation. Online technical support is also provided for basic level lean implementation and the basic certification is completely free.

For intermediate and advanced level MSMEs have to form Group of Enterprises. Group of enterprises means a group formed with at least 4 or Maximum of 10 MSMEs. Implementing agency will provide guidance for forming Group of Enterprise. A designated lean consultant will provide guidance throughout the lean implementation in Intermediate and advanced levels. The maximum cost of lean implementation for a MSME unit under (excluding of taxes) intermediate level is 120,000 rupees and advanced level is 240,000 rupees. The best part of the lean scheme is that 90 per cent of the implementation cost will be provided as subsidy by the Ministry of MSME. Details regarding the lean scheme implementation mechanism are available in the lean portal of Ministry of MSME.

Implementation of this scheme is through Quality Council of India, National Productivity Council and the Offices of Development Commissioner (DC-MSME). According to (*Ministry of Micro, Small and Medium Enterprises Annual Report 2022-23*, 2023), Ministry of MSME

has allocated Rs. 8.34 crore in the year 2022-23 for implementing this scheme.

The lean MSME portal of Government of India (lean.msme.gov.in) shows that, 3787 MSMEs have registered for this scheme, 3696 MSMEs have taken the lean pledge and 1521 got certified for basic level and 207 MSMEs registered for intermediate level. And as of now total of 21 Group of Enterprises has formed. In order to provide awareness on lean scheme, various training programmes have been conducted by the ministry. In spite of all these promotional measures of the Government to promote lean, it is observed that lean scheme participation by MSMEs is low compared to other government schemes. Government's measurers to promote Lean manufacturing in MSMEs are appreciable, however, more promotions, mass campaigns and awareness drive are needed for attract more participation.

9. Findings and Suggestions

From the previous literature it is revealed that lean is not only meant for large enterprises, it can be successfully implemented in every organisation irrespective of its size and operation. However, unlike large organisation, MSMEs have to face a lot of constraints while implementing lean manufacturing. Lack of support from management and employees is the prominent one and lack of financial and non-financial resources to implement lean is the other reason. Under lean scheme, 90 per cent of cost of lean implementation is provided as subsidy for MSMEs. But, most of the MSMEs are unaware about the advantages of lean implementation and they have little knowledge about the lean scheme. Due to this, lean is not much practiced among MSMEs. Low-cost practices such as 5S, Kanban etc are suggested by various researchers to implement in MSMEs and these practices are accepted as quality management practices worldwide. Thus, a complete lean transformation can be achieved by the MSMEs. For this, there is a need for adequate awareness campaigns, promotional drives and training sessions. Massive trainings and worksshops on lean practices should be conducted for employees of MSMEs. By overcoming these challenges, MSMEs can successfully implement lean in their business.

10. Conclusion

MSME sector in India is facing a lot of challenges due to globalisation. They are under pressure to develop cost reducing and quality-improving measures in order to attract customers as well as to sustain their business. Implementing lean in their business is the solution for MSMEs to become competitive in the market. It helps to identify all kinds of unnecessary wastages and improve productivity. From the literature it is revealed that lean implementation in India is in its starting stage, and awareness about the lean techniques is less. MSMEs should come forward to implement lean manufacturing tools and techniques. It was intended that this study would be of interest to entrepreneurs, industrialist and researchers in operations management field and this study will assist MSMEs to get a general understanding on Manufacturing Competitiveness Lean Scheme. In conclusion, effort should be made by the ministry of MSME and other implementing agencies to encourage lean implementation in MSMEs.

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