

# To Implementation of lean tools to reduce manufacturing time in different manufacturing industry

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*Abstract: Lean manufacturing and Kaizen proved to be successful techniques in order to improve the performance level of SMEs. The proper understanding of lean implementation problems can help to achieve justifiable growth of the organization. Lean eliminates waste and Kaizen continuously grows the process, product and system through small-small changes. The lean implementation impacts organizational improvement in five opportunities: waste elimination, continuous improvement, continuous flow and pull-driven systems, multifunctional teams and evidence systems. In this report the work has been carried out in flameproof control gear manufacturing company. It is very large firm with too many customers but currently facing some issues in plant like low output, lack of raw material, improper production planning. Because of these products are not delivered on time to customers. The information at individual stations about cycle time, up time or consumption of resources, set-up time or change over time, work in process inventory, man power requirement and the information flow from raw material to finish goods. It covers both value adding as well as non-value-adding actions. However, VSM method is used to discover the wastes, inefficiencies, non-value added steps in a single, definable process. 5s, vsm and kaizen the basic important of lean work system. It's a tool for cleaning, sorting, organization and reducing throughput time. To implement this, so most important methodology can be used like 5s, vsm and kaizen.*

*In the case study, Lean-Kaizen concept is applied to Indian SMEs manufacturing many products to identify waste across the organization and apply suitable lean tools and techniques for removal of waste. By taking Lean-Kaizen implementation challenges into image, the focus is given on small-small improvements that remove waste at all level of organization. After implementing these all methodologies, results will be succeeded in terms of productivity, time management, reducing inventory, increased customer satisfaction, reducing lead time and good working environment.*

**Index Terms - 5S, VSM (value stream mapping), kaizen, one piece flow concept.**

## I. INTRODUCTION

FCG Hi-tech (flameproof control gears) Pvt. Ltd., Plot No. 202, Phase 2, GIDC Industrial Area, Vapi, Gujarat, 396195, India is reputed manufacture of explosion and flameproof in India since last 30 years.

The company has ISO 9001 certificates, which reproduces quality management system to international standards. It has its head office at Mumbai and other regional offices at Chennai and Kolkata.

An enterprise is a business, company, agency or firm which focuses on earning a revenue. According to development and regulation Act, 1951, those enterprises which invest in plant and machinery are termed as 'Manufacturing Enterprise' and those enterprises which engage in providing services of equipment are termed as 'Service Enterprises'. According to Micro, Small & Medium Enterprises Development (MSMED) Act, 2006, a small and medium sized enterprise (SMEs) is one which has an investment in plant and machinery in between five and ten cores Indian rupees (INR) and fewer than 500 employees.

## II. LITERATURE REVIEW.

**Vinodh et al. [1]** Improvement in leanness parameter. A value stream included all the operations and processes to convert raw materials into finished goods or services. They goal is to identify and removed waste, which is any activity that does not add value to the final product, in the production process.

**Gonzalez et al. [2]** advanced a complete understanding of CSFs and their relationship for CI success.

**Singh et al. [3]** Defined importance of 26 lean matters to Indian industry.

**Vendan et al. [4]** determined the implementation of lean philosophy through layout change.

**Singh et al. [5]** Developed lean indices that denote the true lean status in the Indian environment.

**Vinodh et al. [6]** the integrated framework provides a push for bringing about a social change in the organization.

- Eswaramoorthi et al. [7]** Explored present level of lean practices, type of lean tools employed, causes of less priority to lean concepts and estimates level of different wastes.
- Suarez-Barraza et al. [8]** Identification of key issues for successful Kaizen implementation.
- Vinodh et al. [9]** Calculated model to assess the leanness level of a manufacturing organization.
- Panizzolo et al. [10]** explored the adoption of lean production and examined the lean practices deployed by the SMEs.
- Ramesh et al. [11]** Proposed framework for selection of the best classification of VSM tool based on the current.
- Vinodh et al. [12]** Analyzed and identified CSFs for effective lean implementation.
- Saleeshya et al. [13]** Integrated lean tools increases textile process.
- Vimal et al. [14]** Proposed model improves the thinness level of the organization.
- Vinodh et al. [15]** Developed fuzzy leanness index which indicates the leanness level of the society and identifies the obstacles for leanness.
- Swaminathan et al. [16]** demonstrated the implementation of CI and flow on the sprightly software development industrial project.
- Chowdary et al. [17]** Examined lean strategies in pharmaceutical company in order to shrink idle time, inventory costs and significant improvement in on-time delivery of product.
- Chauhan et al. [18]** explored all lean parameters and identified that JIT deliveries are most important manufacturing parameter followed by CI and multifunctional teams. The study concluded that waste is still present in Indian manufacturing industries which need to pay high attention to get removed through implementing lean manufacturing.
- Ghosh et al. [19]** investigated the adoption of lean in Indian developed plants and found first-pass correct output, lead time and productivity are the three main drivers of lean implementation.
- Jeyaraj et al. [20]** Implemented VSM to invention for identifying and reducing worker's idle time.
- Vinodh et al. [21]** Explored useful application of VSM for enabling lean manufacturing.
- Shrivastava et al. [22]** developed an device for simplifying the implementation process in Indian SMEs.
- Gupta et al. [23]** investigated lean performance and found over-processing and extreme defects are the most harmful wastes.
- Gupta et al. [24]** discussed lean concept, its LS implementation, blocks, and benefits.
- Venkataraman et al. [25]** Integrated approach makeshift decision making during waste reduction process.
- Thakkar et al. [26]** Proposed matrix of lean awareness versus level of lean implementation and concluded that quality process and process technology need to be well-appointed for the successful lean Implementation.
- Arya et al. [27]** Proposed method to improve workflow by reducing process time, costs and calculated other associated benefits of Kaizen. Implementation.
- Saboo et al. [28]** Explored and evident effective VSM implementation in Indian SMEs for continually and thoroughly improve their operations.
- Vamsi et al. [29]** Identified gap in empirical research and resolved that theory building and theory verification are common among researchers but found to be partial toward cross-sectional data studies.
- Das et al. [30]** Demonstrated implementation of lean tools for setup time saving in multiple activities of operations to improve productivity of air conditioning coil manufacturing industry.
- Gupta et al. [31]** Analyzed and deployed integrated lean tools (5S and Kaizen) to workspace and quantified associated benefits.
- Bhamu et al. [32]** Highlighted lack of standard implementation process/ framework for lean manufacturing and strongly suggested development of systematic guideline/process for lean implementation like TPM, TQM, or six sigma. The study also conveyed that most of lean tools/ techniques/ methodologies are used as standalone methods.
- Jasti et al. [33]** Highlighted issues in empirical study like requirement of inter- regional research collaborations, applying lean elements as group instead of specific element, ducking all lean wastes instead of specific waste, lack of testing/ inspection and validation of the proposed models/ framework by researchers and application of lean principles in the field of product development and enterprise level in the administrations.
- Arya et al, [34]** Deployed lean implementation methodology using Kaizen principle for cost saving in SMEs.
- Panwar et al. [35]** Analyzed and assessed the lean tools and techniques and its challenges for realizing lean in the process industry, emphasized on identifying the scope for lean in process industry and its associated benefit.

**Vinodh et al. [36]** Analyzed Applied integrated lean tools (VSM and 5S) for enabling leanness of organization by improving application of turning machine, value addition and overall equipment effectiveness.

**Jadhav et al. [37]** Developed framework for justifiable lean implementation at micro level in organization.

**Sharma et al. [38]** Highlighted that lean production practices such as keeping and sharing customer setting up cross-function and cross-organizational design, information database for supply chain business cronies advances quality of information flow in the supply chain which few practices like IT-based procurement practices for a pull-oriented system, An effort to meet customer expectations, long-term enterprise impact negatively on overall competitive potential of the supply chain.

**Kumar et al. [39]** Proposed approach to merging green, lean and six sigma for process and product upgrading and finally identified 21 barriers for GLSPD application in automobile industry.

**Swarnakar et al. [40]** Proposed framework to reduce non-value-added activities, inventory & defect and to improve work philosophy & employee behavior.

**Seth et al. [41]** Applied VSM with Taguchi method in order to segregate value added and non-value added of the heavy-duty industrial power transformer making process and rejected waste within the system.

## CONCLUSION

From the study of above research papers it is observed lack of safety, competence, efficiency, working condition of workers, slip and fall of material have been reduced by 5S methodology

Another tool is vsm that used to identify sources of wasted and for reducing the waste, also detecting the flow of non-value added cost and reducing lead time.

Indicates the different between lean theory and practice, the employees' needs for feedback and direct contribution in the company. The study found that the lack of understanding and knowledge of lean is still present due to lack of training, education, expertise, and inspiration of employees. Many SMEs have applied lean principles to reduce waste in processes instead of removing all waste across the organization. The present study strongly recommends SMEs to conduct lean training and consciousness programs frequently in their organization in order to understand the lean concept, its tools, and techniques in details to their employees and encourage them to do lean practices continuously to achieve the organization's goals. Additionally, the top management needs to pay attention, support, and commitment to all lean activities within the organization. Poor communication / Information Technology (IT) support and poor employee involvement/ engagement/ participation are also reported as significant issues while implementing the Lean-Kaizen concept in SMEs. However, it is essential for SMEs to have reliable quality level before the application of lean otherwise lean implementation result will be reported as serious breakdowns and failures for customers. The study highlights lean application issues in SMEs such as financial problems, cultural barriers/ resistance to change, lack of strategic direction and proper planning also results in ineffective workflow, wasteful productivity, and poor quality. To overcome these issues, SMEs are required to develop the list of actions that can improve the performance of manufacturing enterprises reliably and continuously through the implementation of the Lean-Kaizen concept.

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