IMPORTANCE OF LEAN MANUFACTURING IN SMALL AND MEDIUM ENTERPRISES TO REDUCE WASTE AND TO IMPROVED QUALITY OF THE PRODUCT

Amit Meshram

M-Tech (Mechanical Engg Design), Department of Mechanical Engineering,
Priyadarshini College Of Engineering, Nagpur, Maharashtra, (India)

ABSTRACT

Lean manufacturing is now one of the most powerful manufacturing systems in the world. Numerous plants around the world have attempted to implement or adopt it to enhance their efficiency. However, little studies regarding lean manufacturing have been done in industry. The purpose of this study is to investigate the approach of adopting lean, the tools and techniques implemented, changes in the organizations, the problems encountered as well as the lessons learnt. Many organizations have recognized the importance of lean management in reduction of waste and improvement of quality. Due to the increased competition in the global market, companies are putting a lot of efforts in reducing cost of operations and production in order to offer their products at competitive prices in the market. This study aims at establishing whether the concept of lean manufacturing is implemented in full in small and medium sized enterprises in India. A general case study is done in KEC INTERNATIONAL LTD. how to save time in manufacturing.

Keywords*: *Employees, Lean, Manufacturing, Organisation, Product.

I. INTRODUCTION

Lean manufacturing, Lean enterprise, or lean production, often simply, "lean", is a production philosophy that considers the expenditure of resources in any aspect other than the direct creation of value for the end customer to be wasteful, and thus a target for elimination. Working from the perspective of the client who consumes a product or service, "value" is any action or process that a customer would be willing to pay for. Lean manufacturing helps in improving the quality of products since they are checked at every stage to identify any problems and make arrangements of solving them. It is therefore important for employees in the managerial spectrum to have adequate information about lean manufacturing in order to avoid cases of employees being caught unaware. Basically, India has become a target market for many industries and companies of any kind because of its rapidly growing economic

environment and high potentiality of customers. In this case, companies implementing lean manufacturing are better placed in achieving higher competitive edge in the market.

II. AWARENESS OF LEAN MANUFACTURING

In order for the implementation of lean manufacturing to be successful in the small and midsized enterprises in the electronics and electrical manufacturing industry in India, employees in the management spectrum must have adequate information. Basically, implementation of lean manufacturing requires collaboration between production and management departments to ensure that all the required resources are provided timely and adequately. It is therefore the responsibility of the lean manufacturing implementation team to ensure that employees are adequately engaged. For instance, employees will be in a position too ferny required support or assistance if they are aware of the importance of lean manufacturing. The study indicated that before implementation of the lean process, adequate training programs were offered to employees and the implementation teams to enable them offer the required assistance. Basically, if employees in the management spectrum are not aware of lean processes, they may hinder effective implementation of lean manufacturing because of fearing that the process would replace the mint their duties.

From the study findings it is clear that information was gathered mostly from employees in the production and quality assurance departments who had worked in the company for a long period of time to understand its organizational structures and cultures. The figure below indicates Lean manufacturing was aimed at improving the quality of products produced by the KEC INTERNATIONAL LTD. company hence quality assurance managers and executives must had adequate information concerning the benefits of the process both to them and the entire organization. Employees in the management sectors need to be informed about the process in order to weigh its benefits and challenges and make decisions of its viability. For instance, the implementation of lean manufacturing require adequate training especially to the implementers and other involved stakeholders and therefore the finance department manager must be in formed to give directions on the amount of money to support the process. Additionally, the human resource manager needs adequate information and awareness about the process in order to plan how employees would help in the implementation process. Failure of informing and training employees on lean manufacturing implementation may result in conflict of ideas and roles where a manager does not want the process implemented because of lack of adequate information on its importance.

It should be noted that implementation of any lean manufacturing process in an organization start with education or training of implementation teams and other employees. Training is conducted because through educating employees, manufacturers gather adequate information on the process and equip themselves with lean thinking. Training is also conducted to familiarize managers and employees with the lean tools as well as the overall benefits of the process. In the study on the investigation of manufacturing capability of small and midsized enterprises using lean manufacturing, the results indicated that managers and employees were well trained prior to the implementation of the lean manufacturing practices to prevent conflicting ideas and massive rejection of the practice. In this respect, all employees in the managerial sectors were familiarized with the benefits and importance of lean manufacturing to the entire organization.

The results of the study indicated that employees were grouped into three categories according to the level of awareness of the lean manufacturing process. Group A comprises of responses as non-lean manufacturing program, Group B comprises of respondents indicating that they were in transition to lean, and Group C comprised of respondents with adequate information of the lean practices.

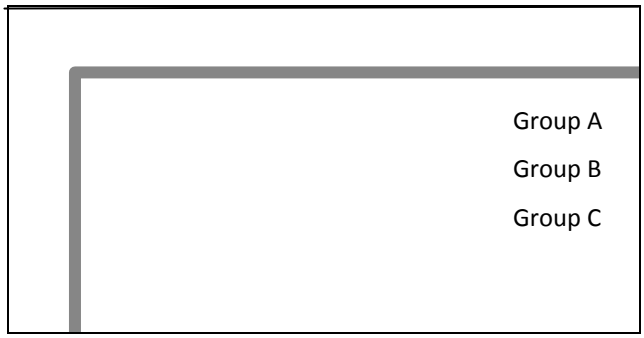

Figure1: Implementation of Lean Manufacturing

The researcher was interested in investigating whether SME simple men the process of lean manufacturing in full or partially. As noted by Kumar et al. lean manufacturing can be classified into five different groups ;management planning and control, process and equipment ,customers 'relationships, human resources, and suppliers 'relationships. It sometimes becomes very hard and costly to implement lean manufacturing fully in an organization because it would mean restructuring the whole production process. Thus, organizations prefer implementing the practices in bits. As Wong and Wong note, implementation of lean manufacturing practices would require complete refurbish of a firm in order to create room for the introduction of new practices. Small and midsized enterprises must ensure that they are still in operation even during the lean manufacturing implementation processes. They are therefore forced to implement the practices in bits in order to evaluate and assess their profits and importance in the organization. Basically, complete implementation of the practices would require that all the employees in the organization are trained on new organizational operations which may be very costly. Process and equipment is mainly putting the right equipment at place in order to reduce the lead time by ensuring a clear layout of functional process and removing all forms of time miss management that do not add value to the final products like equipment break down and consuming a lot of time in searching for the right equipment. It is the responsibility of the management to ensure that all equipments are functioning and the required items are made available. In KEC INTERNATONAL LTD., the factory floor is the actual place where values are added to the final product. Provision of the right material on a timely manner improves time management and the entire process as no time is wasted in searching for the right material for manufacturing, with the help of rack arrangement and coding system provide to individual item such that they are place with their part families and it can be easily identified.

Manufacturing planning and control as a lean manufacturing implementation process involves the attainment of the day-to-day operational objectives of a company. Prior to implementation lean tools must be approved by the top managers. The implementation team then offers directions on what, when, how, and how much to produce. This shows that the implementation process is done in stages in order to recognize any defects that arise during the implementation process. Manufacturing industry must ensure that they fully implement lean management though in

stages. Planning and control stage ensures that there is effective and efficient flow of information as well as materials along the production line in order to identify production wastes and remove them such as production bottlenecks, re-work, and raw material inventory.

The other aspect of lean manufacturing implementation is development and involvement of human resources .High staff commitment to the implementation process is essential in ensuring that all employees are involved in the process. Decision making are usually made from a participatory perspective in order to give each and every employee a chance to contribute to the process. Employees should be empowered through regular training as a way of making sure that they are always sure of what they are doing. Basically, the implementation process may be jeopardized if the employees do not have adequate skills on what they are supposed to do. The figure below indicates the employee responses on the adoption of lean manufacturing processes

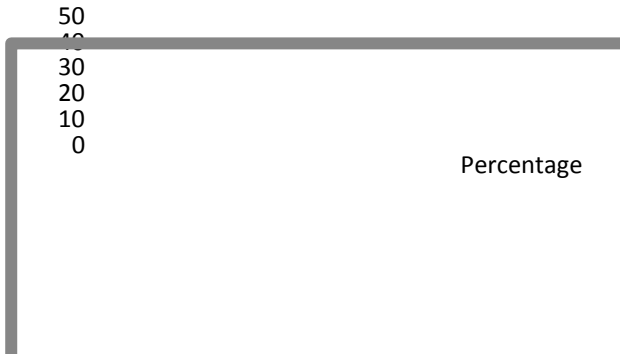

Figure 2: Lean Manufacturing Implementation Indicators

One of the major principles of lean manufacturing is elimination of wastes however; in order to effectively remove waste in the production process the activity should first be measured. Small and midsized enterprises interested in eliminating waste and improving the quality of their products must set lean manufacturing indicators. For instance, a company may aim at achieving a 50% reduction in lead time in a manufacturing plant in order to increase availability of their products in the market. Without indicators it would be hard for companies to implement lean manufacturing practices as they are implemented on the bases of the set objectives.

Figure 3: Waste in Industry

Improvement of product or service quality and an increase in competitive advantage are the main indicators of lean manufacturing implementation. For instance, a company may have a goal of improving product quality by 50% in order to be able to compete effectively in the market.

III. CASE STUDY

Short case study is done in KEC INTERNATIONAL LTD. Company. KEC is totally manufacturing based industry; final product of the company is tower for this final product KEC required tons of raw materials which is purchased from various private and government rolling mills. After entering the material in the factory layout it is kept in raw yard, raw material is kept one over the other there is no segregation of the material is done but at the time of manufacturing when the machines is to be loaded with material it is found that most of the machines are kept idle due to unavailability of material as per the production plan and number of workers are engage to find the right raw material as per the requirement of production plan and lots of material as well as time is being wasted. After adopting the practice of Lean Manufacturing by the company from top management to worker level it is found that after receiving of each type of raw material it is kept in particular bay or with their part families, raw material is provided with stickers, barcodes, as well as with color paint so that it can be easily distinguished with one another and hence proper inventory level is maintained, production time and material handling is reduced and idle time of machine is minimized.

IV. LEAN MANUFACTURING PRINCIPLES GIVES COMPETITIVE ADVANTAGES

The performance of SMEs can be improved by lean manufacturing and management techniques in order to be sustained in the global competitive market. These companies aim at competing with larger and more established companies in the global market thus they must adopt strategies that would increase their competitive advantages. In the current conditions, companies that are successful in cost reduction and product improvement are in a better position to effectively compete in the global economy. In order to secure the complete benefits of lean manufacturing, small and midsized enterprises are required to focus on the whole chain value through the implementation of comprehensive lean practices. Even though there are few challenges or barriers faced by companies when implementing lean practices, they are able to compete effectively in the market as their quality is improved and fewer resources are used in the production process. For instance, a company with comprehensively implemented lean manufacturing is able to offer its products and services at reduced prices in the market because production and operation costs are reduced drastically and any form of waste that could increase cost is eliminated.

V. ACKNOWLEDGEMENT

The information presented in this paper can be used or emulated by other companies to improve their operational performance and increase productivity.

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