ABSTRACT

Enhancement of Competitiveness in Manufacturing Industries through Lean Manufacturing Practices- Some Studies

Submitted By: Mrs. Maya Dilipkumar Vadhvani
Assistant Professor, Production Engineering Department, Shantilal Shah Engineering College, Bhavnagar
Ph. D. Research Scholar, Mechanical Engineering, Faculty of Technology, R. K. University, Rajkot

Supervised By: Dr. M. G. Bhatt
Principal, Shantilal Shah Engineering College, Bhavnagar

Keywords: Lean Principles, Lean Manufacturing Practices, Manufacturing Performance Measures, Competitiveness Dimensions, Motivational Factors, Barriers to Implement Lean Manufacturing Practices, Manufacturing Industries of India

Indian manufacturing industries are gaining more attention due to globalization, but they are facing the challenges of cost reduction, speed to market, customer satisfaction, flexibility and quality. Since long firms are exploring the solutions for different issues like higher lead time, work in process, defects, proper housekeeping and total participation of employees. They are trying to reduce or eliminate the non value added activities which are not creating any wealth for the organization and hence not supporting to improve competitiveness in the market. Manufacturers are focusing on reduction of production time and cost. To be competitive, development of smart manufacturing strategy is essential for sustainable growth.

Lean manufacturing principles and practices can play a vital role to achieve the strategic goal of manufacturing and can improve the manufacturing performance and hence the competitiveness. Numbers of research works are reported in the area of lean in various countries focusing
on service and manufacturing sectors. But in India there is only a hand count numbers that focus on application of lean principles in manufacturing sector. An attempt is made in this research to identify specific relationship between the practices and the manufacturing performance measures. Present research work also has the motive of making suggestions for competitiveness index of India through manufacturing performance with the help of lean principles and manufacturing practices.

To achieve the objectives of this research a survey is conducted to collect feedbacks from manufacturing industries of India and opinions from the industry and academic experts using questionnaire tool exclusively developed for the purpose. Cyclic framework is developed and verified with identified parameters of lean manufacturing practice (LMP) for improving competitive dimension (CD) and manufacturing performance measure (MPM). A set of guidelines is proposed to select LMP for improving CD and MPM.

Published case studies of industries, competitiveness reports of World Economic Forum, published reports of Auto Component Manufacturing Association of India, research papers in the field of competitiveness and lean manufacturing were studied thoroughly to decide the objectives and selecting industry sample for the study. The questionnaire was communicated to the industry personnel and the experts through email and e-links to get faster responses and for precise record. The feedbacks received were analysed with qualitative and quantitative analysis techniques. Descriptive statistics and hypothesis testing were carried out to evaluate the objectives of the research.

Based on improvement achieved in MPMs and CDs with LMPs the proposed relationship between them is validated. The other associated aspects like supportive implementation practices, motivational factors and barriers, review practices for improvement achieved are also analysed. Based on the cross inferences a general set of guidelines and a supportive tool i.e. flow chart, are designed to support the implementation of LMP(s), that may be followed for implementation of LMPs.