
LEAN MANUFACTURING – SMART WAY TO DO BUSINESS

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Abstract: The need for lean manufacturing in auto component industry has become a catch phrase lately. Every manufacturer wants to be lean, but only a few are successful at being so. Achieving the required level of lean will help firms adapt rapidly and manage the costs of a fast changing environment and customer behavior. Firms must learn lean attitude. The purpose of this study is to investigate the adoption of lean manufacturing in the auto component manufacturing firms in and around Pune. A questionnaire survey was used to examine various issues associated with lean manufacturing, such as its understanding among the respondent companies, its benefits, hurdle faced, the tools and techniques used. The study results show that auto component manufacturing firms are committed to implement lean manufacturing. This study investigates the actual implementation of lean manufacturing in firms situated in and around Pune. Significant suggestions are put forth to enrich the knowledge of professionals to make the lean implementation process easy and fruitful.

Key Words: Lean manufacturing, lean tools, Lean implementation

Introduction:

The expansions of manufacturing industries continue to incessantly advance their essential technologies in the specialized area to gain the sustainable competitive advantage, which is important for manufacturers to remain competitive in their respective markets. Another change which is noticed is, manufacturing units striving to understand the principles of lean manufacturing and the steps to implement them to ensure that they are on the leading edge of manufacturing. Indian manufacturers in the auto component industry have always faced increasing challenges such as rising customers' expectation, fluctuating demand and competition in markets. There is no doubt that these manufacturers are accepting changes and improvements in their key activities or processes to cope up with the challenges.

Lean manufacturing is receiving a lot of attention in the industry and the effects claimed after implementation is enormous. Lean manufacturing uses less of resources to develop a new product and has now become a production method for many manufacturers to pursue.

A survey is required to be carried out in order to judge the impact of lean manufacturing on auto component manufacturers in and around Pune. This research was initiated with a focus to examine the adoption of lean manufacturing in the auto component manufacturing companies.

Various issues such as its understanding of lean manufacturing among the respondent companies, its benefits and hurdles, and the tools and techniques used were investigated. In addition, the degree of implementation of areas of lean manufacturing was assessed. The objective of this paper is to learn by way of understanding and evaluating the lean implementation practices in auto component manufacturing companies in Pune.

Lean approach needs to be defined with the steps for implementation. This may consist of the principles, methods and techniques, tools, skills, advantages, hurdles and other forms of knowledge that go into making up any practice in the auto component manufacturing industries in Pune.

Now day's industries are striving for better product offerings by creating value for their customers, which requires great amount of innovation, in charting strategies/methodologies till its execution in order to achieve desired goal. The rapidly changing external/ internal environment forces firms to move from their manufacturing paradigm to new solutions to respond customers' needs quickly.

Lean techniques are playing very crucial role in keeping manufacturing and other sectors at competitive edge and equally keeping customer satisfied. The automobile/manufacturing industry in Pune is looking aggressively to leverage lean advantages, not limited to the domestic markets, but stretching it to have global reach.

Lean approach is completely different approach compared with any traditional technique like batch or queue manufacturing environment. In simple words "Lean" means to maximize customer value and to minimize waste through continuous improvement. Toyota way is briefly summarized through the two pillars, namely continuous improvement i.e. (Kaizen) and Respect people (Organization culture).

Current Scenario in automobile industry around Pune:

Pune and its surrounding area encompass variety of manufacturing industries. Automobile industries and ancillaries are major economy drivers; hence, it is important to touch this industry vertical in order to get comprehensive knowledge. Major automobile companies like Tata, Mahindra, Fiat, Volkswagen, General Motors, Mercedes Benz etc and their suppliers/ancillaries like KSPG, Mahale, Anand group, Autoline, Varroc, Endurance, etc. are located around Pune. All the organizations are working hard to excel their performance in the current impulsive and competitive economy. They are trying to deliver maximize value to their customers by using / implementing new and innovative techniques in their manufacturing process to make it more efficient and effective.

Objective and Methodology:

Very few manufacturers have managed to imitate lean manufacturing successfully, even though the company has been extraordinarily open to its practices. It is to be understood that the secret to lean manufacturing industries' success lies in clear understanding of work study, time study, simplification, standardization and systematization supported by action. Therefore, to study the implementation of

lean approach, it is essential to understand the working of auto component manufacturing firms following the fundamental principles of lean manufacturing.

The current study has focused on responses of 40 respondents, randomly chosen from auto component manufacturing firms in and around Pune. A well drafted questionnaire was administered

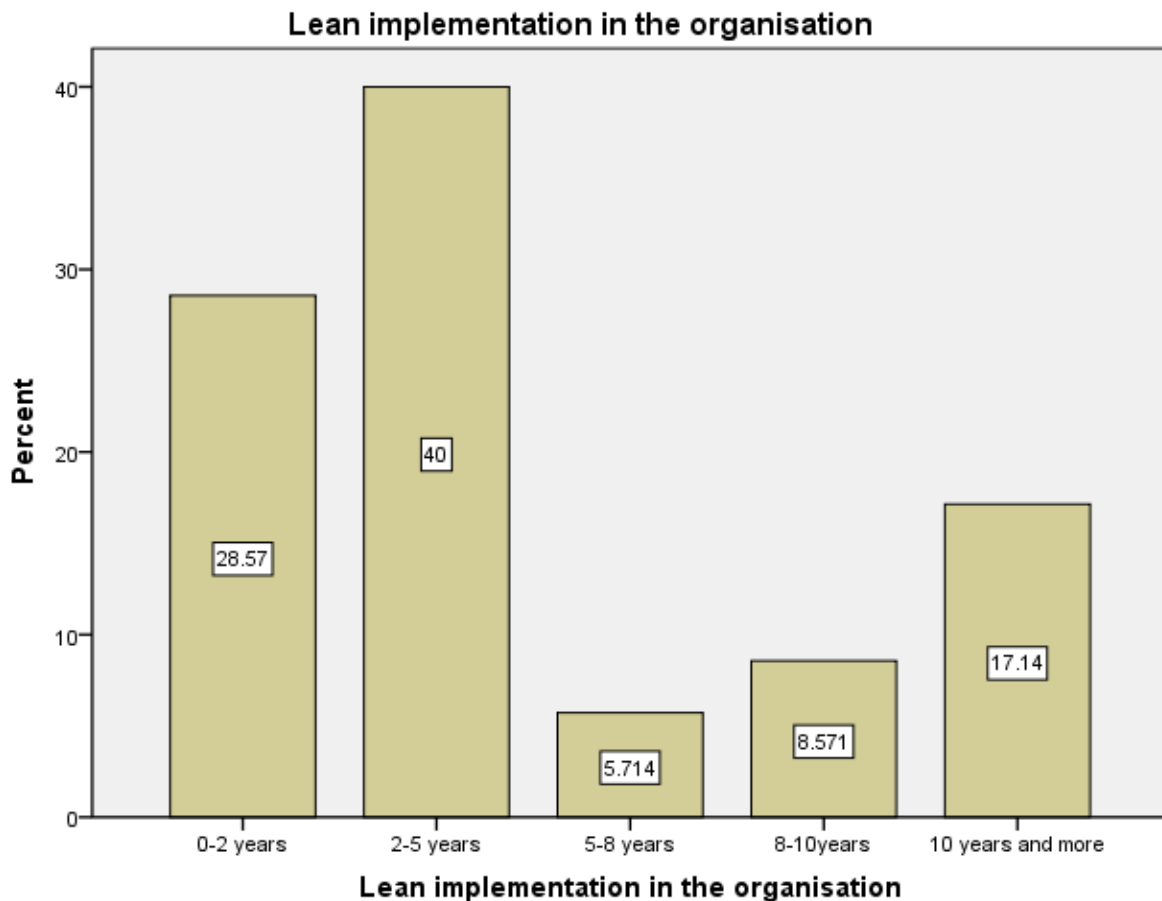
to respondents and the responses were analyzed using SPSS version19. Questionnaire was checked for validity and reliability. The results are presented and discussed in next section.

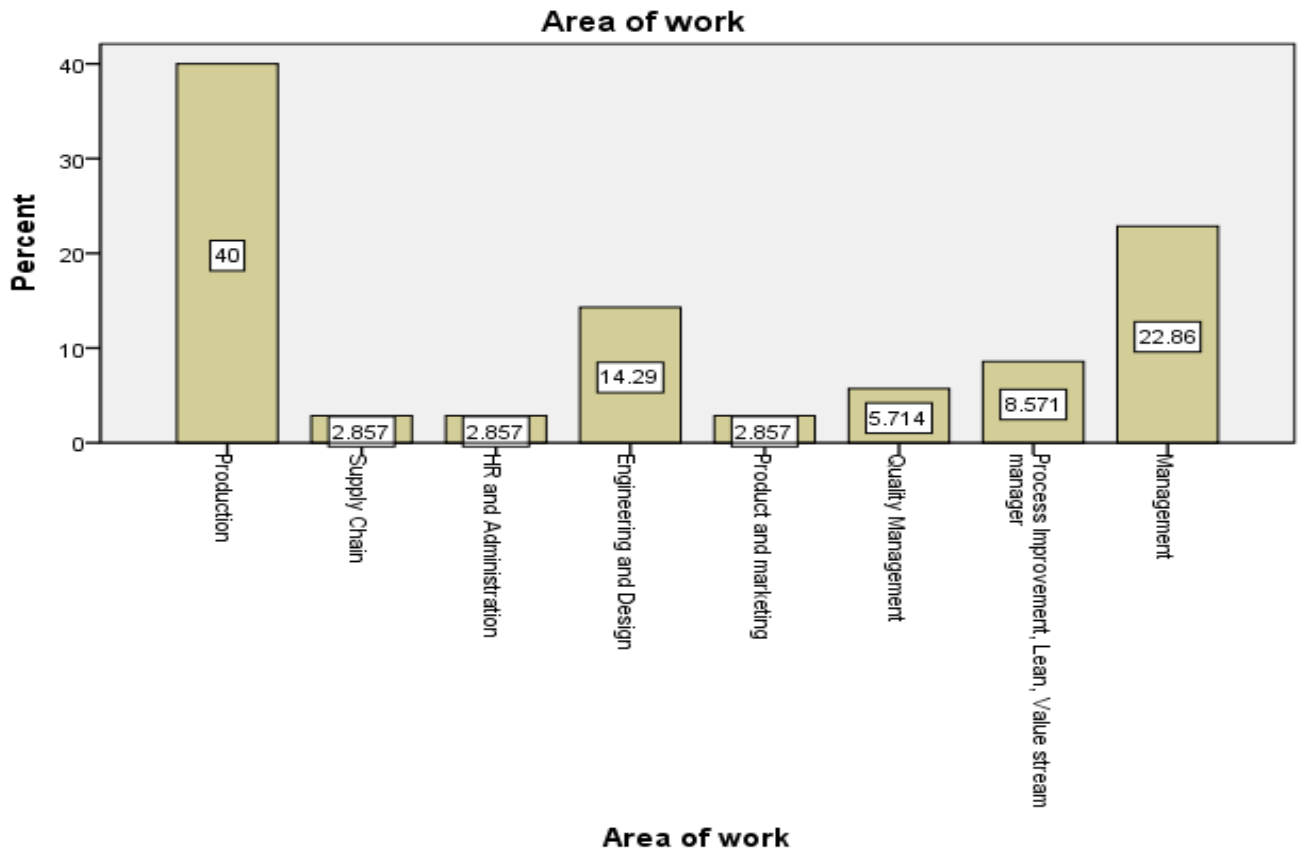
Results and Discussion:

Majority of the respondents were of the age between 41-55 years, giving more weightage (experienced respondents) to the responses collected by the researcher. 40 % respondents were post graduates and major percentages of respondents are having experience between 16 to 21 years making the responses more authenticated and genuine. The majority of respondents include team leaders, middle level managers, and some Top Management persons.

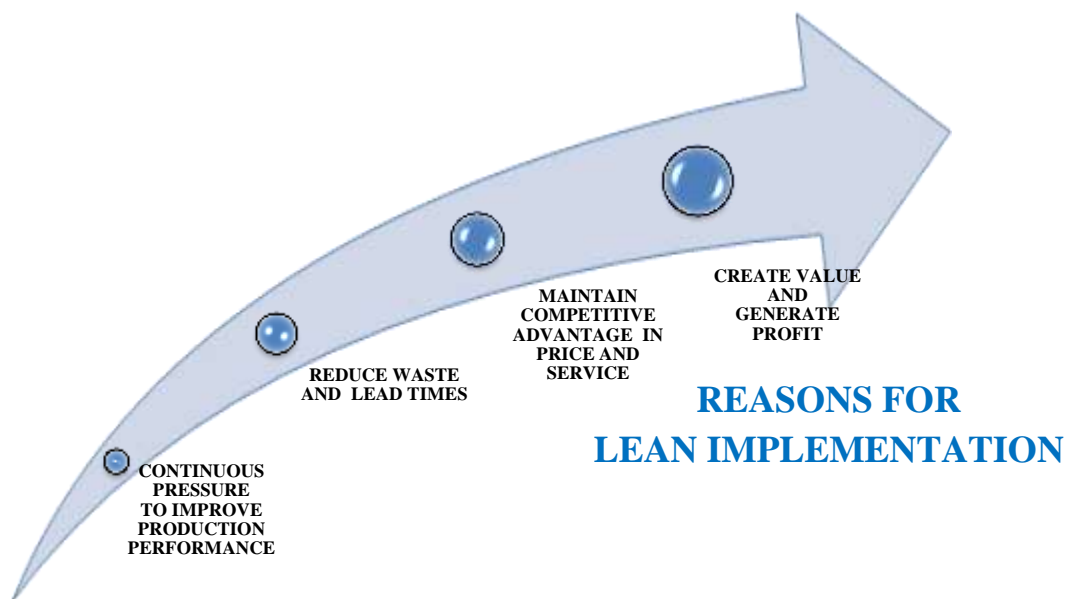
Automobile manufacturers, auto component manufacturers and manufacturing firms from Pune district established from last 16 to 20 years were considered for the study. Number of employees working in these firms are more than 51 and less than 100 and only 25% firms have more than 500 employees having turnover below 100 crores.

54% respondents were working in the current firm from last 5 years and 26% are working from more than 21 years. 40% of the respondents are working in production department and 23 % are working in management and 14% work in engineering and design.





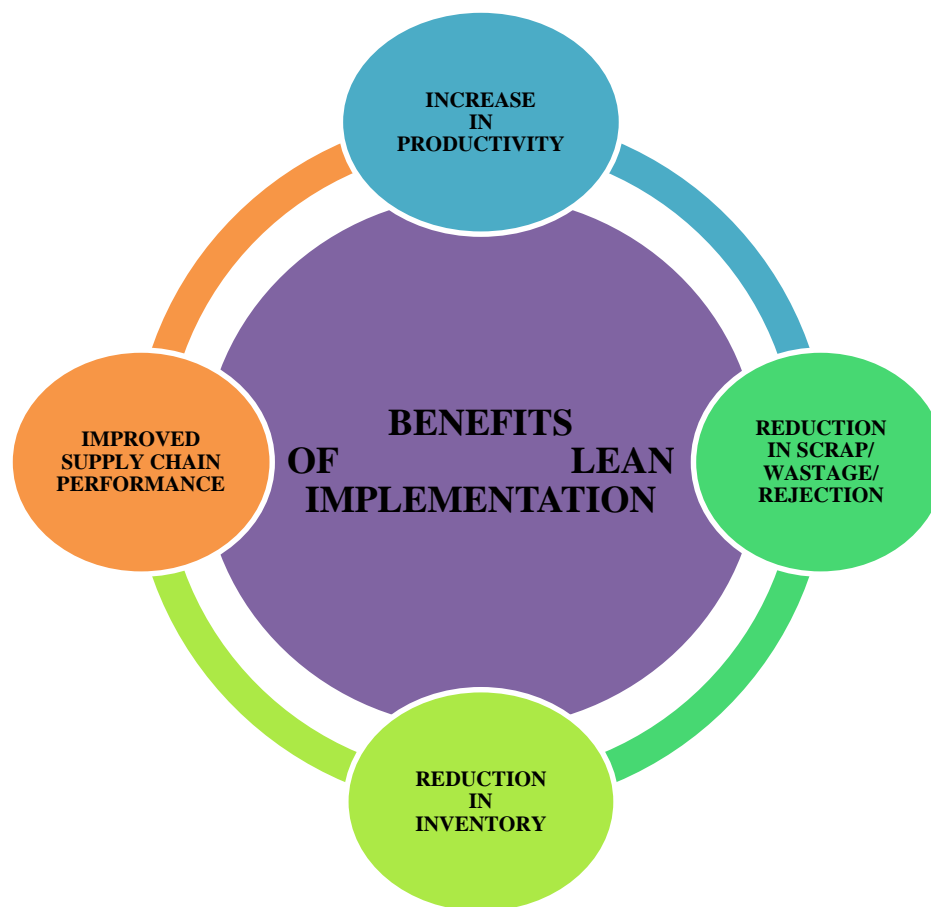
5S, Poka Yoke, Spaghetti diagram, 7 QC tools, Jidoka, Kanban, Standard work, VSM, PDCA, TQM, TPM, Kaizen, SMED, Six Sigma and JIT are top 15 lean tools implemented by organizations and bottom five are Five Whys, Risk Assessment, Heijunka, Cellular layout, and IPO diagrams. The top three reasons to go for lean implementation is to create value and generate profit, to maintain competitive advantage in price and service, to reduce waste and lead times, and continued pressure to improve production performance.



Source: Primary data

It is observed that firms (70%) have bench marked prior to implementation of the lean with short, mid and long term goals/vision. These goals are linked with strategies in 77% firms. Organizations have also defined the time span for short, mid and long term as 0-6 months (short term), 1-3years (midterm) and 3-5 years (long term) respectively. 45% firms have established time based target to evaluate benefits of lean implementation that is between 1-2 years. Top management/board (82% firms) supports lean implementation activities and communicates lean goals and importance in appropriate manner across all levels in the organization.

All the firms using lean tools observed desired increase in productivity, reduction in scrap/ wastage/ rejection, improved supply chain performance, and reduction in inventory. It is concluded that systematic evaluation mechanism to measure financial impact of use of lean tools is missing in these firms.



Source: Primary data

Use of specific set of lean tools to achieve elevated operational performance is varies organization to organization and depends on various factors such as type of product, process, size of the organization, organization culture etc. Elevated operational performance helps organizations to improve financial performance.

During this study, it is observed that, lean tools such as 5S, Visual control, Heijunka, spaghetti diagramming, Process flow mapping, PDCA elevates operational performance by 5% to 10%. Kaizen, Poka-Yoke, 5 Why's, Cellular Layout, elevates operational performance by 10% to 15%.

In some cases, implementation of VSM, Six Sigma, TQM, TPM, JIT, KAN-BAN may elevate operational performance more than 15%.

30% firms start lean implementation by conducting lean training program by experts and studying all lean tools/system. Lean implementation practices are same across group firms.

Lean implementation starts with lean thinking and defining problems in the manufacturing systems. While preparing plan for lean implementation, it is necessary to consider organization culture, organization practices and customer expectations etc. Pull system is one of the key pillars in lean implementation. It is necessary to prepare plan with focused improvements by setting standards for evaluation of performance. Initial objective of lean implementation should be to achieve stability in 4M's (Man, machine, material and method). PDCA mechanism is absolutely necessary to stay focused on lean journey.

It is observed that, standard work and Gemba walk is necessary to maintain sustainability in lean implementation. People tend to follow old habits and ruin the lean implementation till they get sufficiently trained to adopt new system. Other issues with the lean implementations are quick fix expectations, no initiatives/ support from business leaders, lack of know-how and no investment in developing people skills. Use of lean tools adds value to the process, people/culture, and customer and to a lesser extent to Resources. It is also observed that if we implement kaizen, it adds value to all (people/culture, process, resource, and customer).

It is observed that if the work force is educated then lean implementation becomes easy especially for employees educated as ITI's, 12+ITI+ professional course, and diploma. Also employees with 12+ITI and Diploma as educational qualification show very high impact of lean implementation. Thus it can be concluded that higher education background of employee helps in speedy lean implementation.

Generally, in good lean implementation firm, shop-floor employees and business leaders are working as a team to foster lean culture. Employees are taking active participation in kaizen and other lean implementation activities, and business leader appropriately recognize efforts done by employees. It is noticed that some organizations have a policy of appropriate reward and recognition schemes to keep momentum of improvements cycle running.

Lean manufacturing is a proven approach for success in manufacturing firms. However, several firms failed in their attempt to implement lean manufacturing system. The transition to lean manufacturing requires change which involves a total reshaping of purpose, system and culture of the organization. Leadership and direction found to be the most critical factors in managing change to lean

manufacturing. Further, for the smooth transition effective communication, employee engagement and empowerment, and lean review system is required to be established. Failure in recognizing the required change to be adapted in lean transition is the major hindrance in the long-term benefits of the company.

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