"TO STUDY AND USED OF WASTE MATERIAL FOR APPLY LEAN MANUFACTURING IN INDUSTRIAL WORK"

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ABSTRACT

At present scenario, Lean Manufacturing has become a worldwide phenomenon. It is quite successful in drawing the attention of companies of all sizes. A large number of organizations are following Lean technologies and experiencing vast improvements in quality, production, customer service, and profitability. Lean Manufacturing is a systematic approach to identifying and eliminating waste through continuous improvement. The manufacturing industry in India must also look to leverage its advantages, its large domestic market, good conditions in terms of raw materials and skilled labour, and the quality focus. In India at the state level, there are few companies that are implementing Lean manufacturing techniques. However, there are alternative methods of describing the problem. It is possible to say that companies are trying to get closer to their goal by modification of the basic concepts. And the concept of Lean Enterprise serves as a standard.

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KEY WORDS: *lean production, mass production, waste.*

1. INTRODUCTION

Economic crisis showed that it is necessary to focus on reducing costs. Hiding problems of production lines by high stocks is no more solution in mass production. Corporate management has to focus on revealing and solving problems. The portfolio of solutions of these problems is globally large. It consists of complex systems of e.g. lean manufacturing, six sigma, TOC (Theory of Constraints) or elder approaches through simple methods. In this article, we will focus on application of lean methods in mass production and their modification with utilizing knowledge obtained from questionnaire survey. The modification is necessary because it is not primarily designed for mass production. The major part of article is to inform about the state of utilizing lean methods in praxis in mass production so we realized the survey in the V4 countries focused on knowledge and level of utilization of lean techniques in industrial enterprises. The Lean Manufacturing approach is meant to transform non-value added activity into value added activity. Lean Manufacturing technology has its impetus and focus on whole operation. Lean Manufacturing methods are inclusive of all employees and involve a major change in the embedded attitudes of the individuals that make up the organizations. . In today's highly competitive world, the Indian organizations are striving hard to stay competitive and profitable for a long-term period. They have a golden opportunity to downsize their cost, customer lead-time and cycle time through the application of Lean Manufacturing technologies.

2. LITERATURE REVIEW

The basic ideas behind the lean manufacturing system, which have been practiced for many years in Japan, are waste elimination, cost reduction, and employee empowerment. The term " lean" as Womack and his colleagues define it denotes a system that utilizes less, in term of all inputs, to create the same outputs as those created by a traditional mass production system, while contributing increased varieties for the end customer. Lean Manufacturing started as the Toyota Production System (TPS), developed by the Toyoda (now Toyota) Motor Car Company. In time to follow, Toyoda (now Toyota) began production of engines, small delivery vehicles, trucks, and cars. Jim Womack, Daniel Jones and Daniel Roos (1991) define Lean manufacturing as the systematic elimination of waste. Hayes and Pisano (1994) highlight that Lean uses less, or the minimum, of everything required to produce a product or perform a service. Womack and Jones (1994) elaborate that Lean

manufacturing requires that not only should technical questions be fully understood, but existing relationships between manufacturing and the other areas of the firm should also be examined in depth, as should other factors external to the firm. Dankbaar (1997) reiterates that Lean Manufacturing will be the standard manufacturing mode in the 21st century. As a lean manufacturing is a technique to reduce human efforts and produce defect free product. According to Jafri Mohd Rohani et.al. are production line analysis via value stream mapping for color industry, in this article identify and eliminate waste by using team formation, product selection, conceptual design, and time frame formulation through takt time calculation.

According to Taho yang yiyo kag (2014) suggested and implement lean production system for fishing net manufacturing, use the various lean tools and Simulation method and make to order (MTO) process are apply for the regular shipment. And also use the VSM tool and produce future state map and increase service level and reduce lead time, also says that gives the guide line for the implement the value stream mapping. How to implement VSM and which factor to be consider, and after says that lean manufacturing are apply in any manufacturing industry successfully and reduce cost by elimination of waste.

P. Arunagiri et, al. (2014) identification of high impact lean tool in auto mobile industry using weighted average method and they study about 91 industry and using 30 or more lean tools used get a result by weighted average method to maximum useful tools in automobile industry, first one is 5s lean tool are preferred to elimination waste.

Boppana v. chaudhary et, al. (2012), implement the lean manufacturing in a pharmaceutical company, in this paper take a case study of the product line is creams and ointment. Also in industry problem was fixed operating cost and inability to supply products. In this paper improve the operation with help of lean manufacturing so detect the problem where is the waste are occurs, and use the lean tools is VSM. VSM is a mapping method, with the help of detecting value added and non value added process. Prepare a current state map and use the 5-why method for the collect information. And after create future state map for the improvement with the help of 5s tool. and also used cellular manufacturing and after get the result is reduce inventory, and customer satisfaction, and on time delivery, total cycle time reduced , non value added time has been decrease. And reduced the floor space area.

Teamwork - is a way of organizing the work based on common participation, common cooperation and responsibility of all the team members. The research showed that method of teamwork is one of the most common in mass production. Benefits in the area such as increasing production and an application of the idea " more people, more inspiration" are appreciable. Application of teamwork decreases the risk of making wrong decisions; it helps to strengthen interpersonal relationships; supports competition between individual teams and brings many other benefits, which are undeniable. Teamwork has disadvantages, too. Some of them are: we cannot utilize the management methods based on commands; shared responsibility can have consequence of lower personal responsibility; the work can be cumbersome; if the team has too many members, there are higher demands on time than individual. Opposite of teamwork is classical management of employees, which can be centralized or decentralized. In mass production, both types of management can be utilized. In the long term, the utilization of teamwork seems to be more valuable especially in improving the corporate culture.

TPM – this method is utilized to maintain the constant working pace without unexpected failures. Although the mass production characterized by the production to stock, and thus the variation in the consumption of products is ready, shutdown of production due to unexpected disturbances may take some time. The TPM program consists of six areas: program of autonomous maintenance of equipment, program of planned maintenance, program of education and trainings, planning program for new equipment and units, maintenance system and information system, program of increasing of OEE (Overall Equipment Effectiveness). The TPM method influences the production processes indirectly by maintaining the system in operation without unexpected downtime. TPM has a supportive character on production processes, so the application without any restrictions is possible also in mass production.

3. **Why it' s needed:**

In today' s competition is very increase in business. And customers are more and more aspect for the quality in product so that, standing with other competitors; it is needed to implement the lean manufacturing technique. Because it' s give the better quality of product and customer satisfaction. Without any investment and Also it' s excess of inventory and reduce the cost or non value added activity with the help various lean tools, lean manufacturing also reduce the seven type waste occurring in industry. Like Transport Inventory Motion waiting over processing over production Defect. It is reducing with the help of various lean tools and principal are listed following. 5s, OEE (over all equipment effectiveness), 8 step practical problem solving (PPS),Pareto analysis,

elimination of waste, kaizen, setup time reduction, process mapping, value stream mapping(VSM), quick and easy kaizen, SPC/control charting, 5 why, autonomation, continuous improvement, continuous flow, visual control, design for six sigma(DFSS), cellular manufacturing, production leveling, kanban, line balancing, voice of the customer, Jidoka, Anova, Work standardization, work simplification, fish born diagram, six sigma, takt time, pokayoke/ mistake proofing, it is all lean tools are depend on the industry and industry problem which tools are apply and get a maximum benefits.

4. Method of lean manufacturing:

Method for lean manufacturing is implementation in industry consider some steps are to be taken as following.

(1) Select the target or product.

(2) Gemba walk, for the collecting data and all the data from product line and industry

(3) Prepare a chart or map for the analyzing data and take decision where is the maximum waste or non value added flow, with the help measuring lead time, cycle time, number of workers, and inventory, we are also used the current state map method from VSM.

(4) And after completely understand about the waste or non value added, so that decide the lean tools which lean tools apply and give maximum result, Depend on the waste. like tools are 5s- for the decrease the waiting time, cellular manufacturing focus on industry, SMED- reduce the time consuming by change over time and setup. JIDOKA- set of practice, mistake proofing and automation, kaizen for continuous improvement.

(5) And last one step is improving the problem and gives continuous improvement in future for industry and get increase profit of the industry.

5. Application of Lean Approach

Lean manufacturing is not new in Automobile industry where actually it born. After sudden success of Toyota in 1980' s over the big three (Ford, General Motors and Chrysler) and other Automobile industries, the other industries started implementation to reap the benefits seen in Toyota. Piercy and Rich (2009) discussed the evidences of successful lean implementation in service environment; in call service centre to achieve reducing costs and improving quality. Meier and Forrester (2002) found that lean production practices can be successfully applied to tableware sector characterized by craft manufacturing. Abdulmalek and Rajgopal (2007) argue the frequent application of lean approach to discrete manufacturing than in the continuous/process sector. Lean manufacturing has been applied within the process industries, most notably chemicals and pharmaceuticals sectors, to great effect (Melton, 2005). Sullivan et al. (2002) discussed an equipment replacement decision problem within the context of lean manufacturing for inventory saving, floor space reduction, and high quality.

6. Leanness

The term leanness is interpreted diversely in literature. Leanness is the measure of lean manufacturing practices (Vimal and Vinodh, 2012). Leanness refers to measure its degree of commitment to lean production (Meier and Forrester, 2002). Singh et al. (2010) define leanness in context to assessing lean status of any manufacturing firm.According to Papadopoulou et al. (2005) and Singh et al. (2010) leanness should not be viewed in the narrow sense of a set of tools, techniques and practices, but rather as a holistic approach that transcends the boundaries of the shop-floor thus affecting apart from the production itself almost all the operational aspects, e.g. design, development, quality, maintenance, etc. as well as the entire organization and management of the company. Wan and Chen (2008) refers leanness level to the performance level of a value stream compared with perfection which shows ' how lean' the system is. Production is lean if it is accomplished with minimal waste due to unneeded operations, inefficient operations, or excessive buffering in operations (Hallgren et al. 2009). Meier and Forrester (2002) identified nine variables of leanness, namely: the elimination of wastes, continuous improvement, zero defects, JIT deliveries, pull of materials, multifunctional teams, decentralization, integration of functions and vertical information systems. Meier and Forrester (2002) then concluded thatlean production has been applied successfully to craft production. Wan and Chen (2008) developed a leanness measure evolved from the concept of data envelopment analysis (DEA) that indicates how lean the system is and how much waste exists. Singh et al. (2010) developed a leanness index by introducing fuzzy logic set theory to the measurement method based on the judgment and evaluation given by leanness measurement team (LMT) on various leanness parameters such as supplier' s issues, investment priorities, lean practices, and various waste addressed by lean and customers' issues. Vimal and Vinodh (2012) attempted fuzzy logic-based inference method and developed a conceptual model consisting of three levels namely enabler, criterion, and attributes to compute leanness level using IF-THEN rules. Gurumurthy et al. (2009) applied the benchmarking (BM) tool for assessing the lean manufacturing; BM utilizes a systematic process for improving the performance of product/service, process or an organization as a whole by continuously identifying, understanding, and adapting best practices that are found either inside or outside the organization. Doolen et al. (2005) developed a lean assessment tool to assess both the number and the level of implementation of a broad range of lean practices in an organization.

7. Barriers of Lean Manufacturing

Though lean is accepted by many companies for sustainable growth by learning the Toyota growth story, literature indicates that very less rate of successful lean implementation among the organizations. Bhasin (2012) found out from the literature that less than 10 per cent of UK organizations have accomplished a successful lean implementation. Though principles, practices and tools of lean are backbone of lean manufacturing system but there are other barriers too. Mere implementation of tools, without having established an integrative system that acts as precursor to lean implementation, is not sufficient and it does not help transformation into learning organization (Yadav et al., 2010). Yadav et al. (2010) discovered in their study that many automotive companies attempted to implement few lean principles independently and been very successful in implementing techniques like JIT, Kanban, Production leveling, team building, quality circle, and other but it did not bring them kind of success these companies was expecting through lean implementation. Sim and Rogers (2009) attempted to find out the cultural issues as a barrier to implement continuous improvement strategies and problem of resistance to change. Sim and Rogers (2009) carried out a survey on a Fortune 500 manufacturing plants located in the Eastern USA; while thoroughly committed to theconcept of continuous improvement, plants hasachieved only partial success due to the persistence of legacy attitudes on the part of unionized and high seniority employees.

8. CONCLUSION

This paper has provided important insights into the current status of lean manufacturing implementation in the silk production industry in Andhra pradesh, as well as highlighted some associated issues. Firstly, the respondent companies' general backgrounds (e.g., their size, their involvement in lean manufacturing, etc.) have been discussed. The companies are found to have a good understanding of lean manufacturing, and since its implementation, they have gained many benefits such as reduced cost and improved productivity. It is also apparent that the companies have implemented various tools and techniques to support lean manufacturing, and they do not adopt a single tool in isolation. In order to assess the extent to which they have implemented lean manufacturing. The recent literature shows that the trend in lean manufacturing for research now is focused on lean assessment. Leanness attracts focus to answer specific questions of managers responsible for lean implementation to assess the lean implementation level and to justify spending over lean implementation. In this paper, presents the review of barriers of lean implementation from literature review. Understanding the barriers is important for managers to avoid failures and to sustain lean leap. The future research may be to identify such barriers through extensive literature review and interviews of working professionals as very little work happened on this subject.

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