

INFLUENCE OF LEAN MANUFACTURING TECHNIQUES ON QUALITY AND PRODUCTIVITY – HLL LIFE CARE LIMITED

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ABSTRACT

Lean manufacturing is an integrated system that involves with a set of philosophies, rules, guidelines, tools and techniques which executed to remove significant waste in all business processes for continuous improvement. Descriptive research method was applied in this study to explore the key success factors and process of lean implementation in HLL. Primary data was collected from employees of HLL. Further discussions were made with the help of secondary sources. Moreover, lean assessment tools such as 5S, Value Stream Mapping, Standardized Work, Load Leveling, Kaizen, Visual Workplace, Quick Changeover, Andon, Poka-yoke, One-piece flow, Cellular Manufacturing were discussed to assess the current manufacturing system of the selected company.

Keywords: Commitment, Kaizen, Kanban, 5S, Productivity, Process Management, Quality Management.

INTRODUCTION

Lean is the term used to describe the production systems and methods developed by the Toyota company in the post war years. Lean about by focusing on the reduction of the non-valued activities within the organization. Lean is all about achieving more value by applying fewer resources more effectively and efficiently through the continuous elimination of non-valued activities or wastes.

A lean manufacturing initiative concentrates on cost minimization and increases in turnover by steadily and uninterruptedly removing non-value-added activities. In today's competitive

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market, lean is turning out to be "the solution" to manufacturing industries across the spectrum for existence and victory. Lean manufacturing supports organizations to attain targeted productivity and more. It focuses on waste reduction and changes every process into profitable.

Thousands of companies have attained tremendous productivity and return on investments by applying lean practices and techniques. India has seen many success stories in its automotive, process and other industries. Hence, we can say, lean manufacturing is driving toward achieving profitability and productivity through continuous improvement and resource waste elimination. Lean manufacturing or lean production, often simply is a systematic method for waste minimization ("Muda") within a manufacturing system without sacrificing productivity. Lean also takes into account waste created through overburden ("Muri") and waste created through unevenness in workloads ("Mura"). 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.

NEED AND SIGNIFICANCE OF STUDY

An organization will be productive only if it has an effective waste management system. The basics of lean manufacturing employ continuous improvement process to focus on the elimination of wastes or reduce non-value-added activities within the organization. Lean concept aimed at identifying and reducing the non-valued activities and eliminates wastes so as to enhance the productivity of the firm. This situation has led to this study.

OBJECTIVES OF THE STUDY

- To study about the Lean manufacturing in HLL
- To understand various wastes that are coming in each stage of production.
- To suggest appropriate strategy/tool in enhancing the efficiency of Lean manufacturing in HLL and thereby increasing the productivity of the company.

SCOPE OF THE STUDY

- Current Lean manufacturing is analyzed.
- New improvement is suggested.
- Point outs various wastes that are avoidable.
- Point outs various non-valued activities that are reducible

Lean today

In the last couple of decades, lean manufacturing has seen huge growth as a way of identifying and eliminating waste, or activities and resources that do not add value. By focusing on value-added activity, customer requirements and removing wasteful processes, organizations have optimized business processes and improved customer satisfaction. Early adopters of lean methodologies were satisfied with simple, manual solutions and the flexibility they provided, which may help explain why some practitioners say the most high-tech tools that lean should involve is paper, pencils and spreadsheets. Yet a number of technological advances and external pressures — ever-escalating customer expectations, pricing pressures and expanding supply chains — are making technology less likely to go head-to-head with lean today. In recent years, manufacturers have become more sophisticated with their lean-enabling technology implementation, moving beyond electronic kanban

COMPANY PROFILE

HLL Life Care Limited is the main organization on the planet assembling and showcasing the most extensive scope of contraceptives. It is exceptional in giving a scope of Condoms, including female Condoms, Intra Uterine Devices, Oral Contraceptive Pills-steroidal, non-steroidal and Emergency prophylactic pills; and Tubal Rings. HLL today handle 1.316 billion condoms making it one of the world's driving producer of condoms, representing about 10% of the worldwide creation limit.

HLL is an open part undertaking which create social insurance items and contraceptives. It has been winning benefit at expanding pattern consistently. Lean assembling investigation contemplates the adequacy of waste minimization of the firm. It has been discovered that organization's waste minimization can be progressed.

Plainly HLL is a gainful association among different firms in a similar industry. And, after its all said and done the gainfulness can be additionally expanded by making different strides for lessening squanders and along these lines decreasing expenses. The examination has investigated the Lean frameworks underway in all stages. From the examination unmistakably, the organization is utilizing the greater part of the lean assembling devices, for example, 5S, Standardized work, stack leveling, Kaizen, Visual work put, Andons, Poka-yoka, Quick change over, and so on.

LITERATURE REVIEW

1. According to Shahram Taj (2006), results of applying constrained management and lean manufacturing in tandem have revealed the plant's overall bottlenecks and means of increasing the throughput. A very useful best practice for the productivity improvement that is easy to use by plants' management to help them identify and manage bottlenecks, and to eliminate waste from the production system
2. According to Sanjay Bhasin (2006), lean has a major strategic significance, though its implementation procedure, HRM implications, general approach to the supplier base coupled with the overall universal conviction of viewing lean as a set of tactics rather than embracing it as a philosophy advocates that this contributes to the relatively low number of successful lean initiatives.
3. In their study, TL Doolen et. al (2005) say that based on both empirical and anecdotal evidence contained in the lean literature, it could be argued that electronic manufacturers are subject to a variety of challenging conditions that limit the applicability of lean production practices. The exploratory study established that even though these conditions may limit the applicability of lean practices, all of the organizations in that study had implemented lean practices to some extent. The results of that study suggested that organizational size and the type of manufacturing may be significant factors.
4. R Florida (1996) examined the relationship between advanced production practices and innovative approaches to environmentally conscious manufacturing. Productivity improvement, quality, cost reduction, continuous improvement and technological innovation can be obtained by implementing advanced manufacturing systems and lean practices in the organization.
5. CM Dües et. al (2011), focused on the relationship and links between Lean and Green supply chain management practices. They provided evidences and suggested that Lean is beneficial for Green practices and the implementation of Green practices in turn also has a positive influence on existing Lean business practices.
6. K Demeter and Z Matyusz (2011), said that companies in several industries are implementing lean practices to keep pace with the competition and achieve better results. They concentrated on how companies can improve their inventory turnover performance through the use of lean practices. They investigated how various

contingency factors (production systems, order types, product types) influence the inventory turnover of lean manufacturers.

7. R Chavez et.al (2013), in their study indicated the relationships between internal lean practices and quality, delivery, flexibility and cost were found to be positive and significant. According to them, industry clock speed was found to moderate the relationship between internal lean practices and quality, delivery and flexibility, but not cost.
8. According to K Birdi et.al(2008),while internal lean practices can improve operational performance, managers should be aware that internal lean practices are not universally applicable, and the rate of change within an industry should be considered at the time of implementing lean principles. Integrated manufacturing and lean production, place greater emphasis on operational initiatives such as total quality management, just-in-time, advanced manufacturing technology, and supply-chain partnering as determinants of organizational performance.
9. G Nawanir (2013), provided evidence that lean practices should be implemented holistically. Their study aimed to investigate the relationship between lean practices, operations performance (OP), and business performance (BP). According to their findings, lean practices have a positive and significant impact on both OP and BP. Moreover, OP partially mediates the relationship between lean practices and BP.
10. MGM Yang et. al (2011), identified the relationships between lean manufacturing practices, environmental management and business performance outcomes. The findings suggest that prior lean manufacturing experiences are positively related to environmental management practices. Their paper provided empirical evidences with large sample size that environmental management practices became an important mediating variable to resolve the conflicts between lean manufacturing and environmental performance.
11. The results of the study by S Rahman and T Laosirihongthong (2010), indicated that lean constructs are significantly related to operational performance. JIT had a higher level of significance in LEs compared with SMEs, whereas for waste minimization there was a higher level of significance for SMEs compared with LEs. Flow management had a much lower level of significance for both SMEs

and LEs. With respect to ownership, JIT was highly significant to operational performance.

12. V Sharma et al (2015), in their study found that two lean criteria, namely, strategic partnership with suppliers and cross-functional cross-organizational design and development teams significantly influenced most of the key performance measures. Some lean criteria were found to negatively affect the overall competitive potential of machine tool firms.
13. S Taj and C Morosan (2011), in their study showed that three factors are sufficient to represent the lean performance dimensions of flow, flexibility, and quality. Their analysis showed that the lean performance factors are strongly related to operations practice and production system design. Their results supported other findings of the positive impact of lean operations on the performance of the organization.
14. According to P Ward and H Zhou (2006), managers seeking to improve lead-time performance are challenged by how to balance resources and investments between process improvement achieved through lean/just-in-time (JIT) practices and information technology (IT) deployment. The results provided several new insights on the relationship between IT integration and lean/JIT practices. First, the study confirmed that implementing lean/JIT practices significantly reduces lead time. Second, lean/JIT practices mediate the influence of IT integration on lead-time performance. The findings provided managers with empirical evidence and a theoretical framework on the balance between lean/JIT and IT for effecting improvement in lead-time performance, thus offering practical guidance on this important question.
15. R Shah and PT Ward (2003), in their study examined the effects of three contextual factors, plant size, plant age and unionization status, on the likelihood of implementing 22 manufacturing practices that are key facets of lean production systems. They empirically validated and investigated the effects on operational performance. The evidence provided strong support for the influence of plant size on lean implementation, whereas the influence of unionization and plant age is less pervasive than conventional wisdom. The results also indicated that lean bundles contribute substantially to the operating performance of plants, and explain about 23%

of the variation in operational performance after accounting for the effects of industry and contextual factors.

DATA ANALYSIS AND INTERPRETATION

Table 1 - Age wise classification of respondents

Age	Respondent	Percentage
18-25	16	16
26-40	34	34
41-50	10	10
Above 50	40	40
Total	100	100

Source: Field survey

Interpretation

From the above table it is observed that about most of the respondents were above 40 years age.

Table 2 - Gender wise classification of respondents

Gender	Male	Female	Total
Male	73	27	100
Percentage	73%	27%	100%

Source: Field survey

Interpretation

From the above table it is observed that about most of the respondents were male.

Table 3 - Educational wise classification of the respondents

NO	PARTICULARS	RESPONDENTS	PERCENTAGE
1	Lower than secondary school	10	10%
2	Secondary school	12	12%
3	Bachelor's degree	48	48%
4	Master degree	30	30%

Source: Field survey

Interpretation

From the above table it is observed that most of the respondents have completed their bachelor's degree or completed their master degree.

Table 4 - Working experience of the respondents

No	Particulars	Respondents	Percentage
1	0-5 Years	15	15%
2	6-10 Years	42	42%
3	11-15 Years	32	32%
4	15-20 Years	11	11%

Source: Field survey

Interpretation

From the above table it is observed that about most of the respondents were having more than six years of experience.

Table 5 - Rating of process and equipment in context to *lean practices* in the organization

	Lean practices	Implementation					Total
		Very poor	Poor	Fair	Good	Very good	
1	Just in Time/Continuous flow	7	14	11	51	17	100
2	Zero defects	9	16	27	40	8	100
3	5s	4	13	25	38	20	100
4	Total productive maintenance	5	18	9	57	11	100

Source: Field survey

Interpretation

From the above table it is observed that most of the respondents felt that, lean practices such as JIT, zero defects, 5S, TPM were followed well in the organization to enhance quality and productivity.

Table 6 - Rating of lean practice related to *manufacturing planning and control* in context to lean implementation

	Manufacturing planning and control	Very poor	Poor	Fair	Good	Very good	Total
1	Total quality management	7	14	23	44	12	100
2	Supply chain management	3	9	31	43	14	100
3	Inventory management	10	17	21	42	10	100
5	Value stream mapping	9	13	27	38	13	100

Source: Field survey

Interpretation

From the above table it is observed that most of the employees agreed that production planning and control methods such as TQM, SCM, Inventory management and Value stream mapping were followed in the organization to enhance quality and productivity.

Table 7 - Rating of lean practices related to *Human Resource* in context to implementation

	Human resource practice	Very poor	Poor	Fair	Good	Very good	Total
1	Cross functional/ Multi-skilled/ Flexible	12	25	18	33	12	100
2	Human resource management	6	17	19	42	16	100

Source: Field survey

Interpretation

From the above table it is observed that rating of lean practices related to *Human Resource* in context to implementation is good

Table 8 - Rating related to *Business/Finance* performance in context to lean implementation

	Performance parameter	Extend					
		Very poor	poor	Fair	Good	Very good	Total
1	Productivity Increase	9	13	25	38	15	100
2	Decrease in manufacturing cost	15	18	33	30	4	100
3	Increase in profit	10	19	27	33	11	100
4	Increase in return on investment	17	19	28	34	2	100

Source: Field survey

Interpretation

From the above table it is observed that most of the respondents agreed that *Business/Finance* performance in context to lean implementation is good.

CONCLUSION

HLL is a public sector undertaking which produce health care products and contraceptives. It has been earning profit at increasing trend throughout the year. Lean manufacturing analysis helps to study the effectiveness of waste minimization of the firm. It has been found that company's waste minimization can be improved. It is clear that HLL is a profitable organization among other firms in the same industry. Even then the profitability can be further increased by taking various steps for reducing wastes and thereby reducing costs. The study has analyzed the Lean systems in production in all stages. From the study it is clear that the company is using most of the lean manufacturing tools such as 5S, Standardized work, load leveling, Kaizen, Visual work place, Andons, Poka-yoka, Quick change over, etc. This

study aimed at forwarding some suggestions for further improvement by reducing non-value-added activities and avoiding wastes in all stages of manufacturing. Thus, the productivity of the firm can be further improved. Even though organization is a highly profit-making company, these suggestions will go a long way in improving the cost effectiveness of the firm. As a manufacturer of contraceptives and health care products, the company has more chance for future diversification.

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