

Lean Thinking in Indian Health Care Sector

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Abstract: *Incidents and quality problems are a prime reason why health care leaders are calling to redesign health care delivery. There is always a rising pressure on Healthcare providers, to reduce costs and improve the quality; many organizations are now looking to “Lean” tools and techniques as a breakthrough solution for performance improvement. In this paper, an overview of lean thinking and its implementation in a hospital located in the southern part of India is been presented. It describes the process improvement in hospitals using lean principles which can have a positive impact on the productivity, cost, quality and timely delivery of services.*

Key Words: *process improvement, quality service, value added and non-value added activities.*

I. INTRODUCTION

The quality services in Indian Health Care Sector vary depending upon the location and income of the population. In India, the private expenditure on health is significantly higher than the government expenditure. At the time of India's independence in 1947, only 8% of the health care delivery was private however, 80 – 85% of the licensed physicians, 93% of the hospitals and 80% of the outpatient clinics in India operate, in whole or in part, within the private sector (March 2013, World Health Statistics).

Though the Indian Government attempts to increase the percentage of total expenditure on health by nearly 3% from 2010 to 2011 the increase still remains insufficient for the increasing population of the country. Also, within urban and rural India, the quality service and infrastructure resources vary significantly. The 68.84% of the total population of India (2011 Census of India) do not receive proper quality health care. Therefore a need for low cost – high quality health care exists for Indian population. Thus, the application of lean thinking is seen as one of the potential solutions for the Indian health care sector.

II. OBJECTIVE OF THE STUDY

The present study, “Lean Thinking in Indian Health Care Sector” mainly deals with the following objectives,

1. To study and identify the bottlenecks faced by the hospital in terms of non-value added activities.
2. To eliminate the bottlenecks and develop Future State value stream map which can increase the value added time and reduce non-value added time.

III. METHODOLOGY

The present study is both qualitative and quantitative. This research is based on the material collected by both primary and secondary data.

IV. COLLECTION OF PRIMARY DATA

The first, we acquired data directly from the company. To do this we talked with the administrator, HR, floor managers and doctors of the Hospital. The methodology is a Qualitative Research; it is concerned with the qualitative phenomenon, i.e., phenomena relating to quality or kind. Qualitative research is especially important in the behavioural sciences where the aim is to discover the primary motives of human behaviour. By this, we can analyze the various factors that motivate people to behave in a manner or which make people like or dislike a particular thing. The data collected is primary data using Observation method. The observation method is most commonly used method especially in studies related to Behavioural Science. The observation was systematically planned and recorded and is subjected to validity and reliability. The advantage of this method is - subjective bias is eliminated, the information is related to the current happening and this method is independent of respondents.

V. REVIEW OF LITERATURE

Lean management principles are effectively used in manufacturing companies for more than decades. It is widely used particularly in Japan. It is believed that lean principles can be indeed successful if applied to the delivery of health care. This is because; the services in healthcare encounter high costs with slow processes because of non-value added activities, which leads to poor quality and fail in satisfying the customer¹⁸. Many healthcare organizations adopt the Toyota Production Systems for performance improvement which is called as the Lean Healthcare management system¹⁷. In order for lean principles to take root and give results in health care, it is important that the leaders must first work to create an organizational culture that accepts the change. The commitment towards lean must start at the very top of the organization, and all staff should follow to improve flow and reduce waste. Although health care differs in many ways from manufacturing industry, there are also surprising similarities: Whether building an automobile or providing health care for a patient, workers rely on many

complex processes to complete their tasks to provide value to the customer or patient, ultimately to gain customer satisfaction.

I. LEAN IN HEALTHCARE

Healthcare organizations are under sturdy force to progress. Society is aging, the demand for healthcare services is increasing, but the Healthcare systems are not improving. In recent times, healthcare systems are challenged to be efficient and cost effective and hence there is a need for new and more efficient ways of providing care. Not soon after WWI TPS, introduced lean manufacturing concepts into the manufacturing industry. The first descriptions of TPS appeared in late 1970's¹ but the book *The Machine That Changed the World* by Womack and Jones² first popularized the approach "Lean production". They were the first authors to propose that lean techniques could be applied to services and specifically to Healthcare.³ They said that implementing Lean in Healthcare is to put the patient in the foreground with keeping time and comfort as key performance measures of the system.

Lean thinking in healthcare lies in eliminating wait time, repeat visits, errors, and inappropriate procedures. Spears⁴ highlight empowerment of employees by providing them with the necessary tools to improve processes in their area of work. This means that all Healthcare staff becomes focused not only on taking care of the patient but also on finding better ways to care for patients. Lean enhances process steps that are valuable and essential for patient care while eliminating those that fail to add value to the process. As a result staff members feel empowered to improve care processes and are more satisfied with their jobs.⁴

The processes in large Healthcare organizations simply evolve over time and are seldom a result of conscious planning and action^{7, 14}. The Healthcare processes are organized with a focus on the doctors, nurses and other clinical staff and are often not optimized for patients^{13, 15}. In such systems, the only person who sees the whole of the patient journey is the patient himself or herself^{7, 15}. Thus, a patient can typically spend hours in hospitals for only some few minutes of value-added time. Applying Lean thinking, specifically value stream and continuous flow, has the potential to help break down the long process, enabling changes to occur across functional boundaries¹⁵. Much of the work which is performed does not directly add value from the patient's point of view⁷ and the consequence is discrepancy in care, unreliability and interruption, which in turn implies inefficiencies; long

wait time, increased potential for errors, and worker frustration⁸.

Lean Healthcare is mostly about managing and improving the processes. So firstly, the healthcare units recognize the patient as primary customers and are to be taken into consideration when designing processes and delivering care. Secondly, it should be seen that the processes are performed with no problems and shortcomings. One of the frequently used principles in lean healthcare is pathway/journey/flow of the patient where they flow through a series of processes. To improve the process the steps in a patient's pathway can be visualized with the help of VSM. With VSM staff can quickly come to understanding that all work is a process and it can be improved⁷. Thirdly, process improvement in healthcare implies how work is to be conducted and remove waste that is in the form of waiting time, rework, workarounds, interruptions, etc¹². In this respect creating continuous flow is the goal of process improvement. Ideally, the patients should move from one step to the next without delay.

II. VALUE STREAM MAPPING

Womack et al (1990), Taiichi Ohno (1988), Daniel T Jones (2006), Womack and Jones (1998, 2005), Peter Hines and Nick Rich (1997), Rother and Shook (1999) have studied the implementation of VSM effectively. VSM is a visualization tool oriented to the Toyota version of Lean Manufacturing (TPS). It helps to understand and streamline work processes using tools and techniques of Lean manufacturing. The goal of VSM is to identify value added activities and decrease waste in the process. VSM can thus serve as a starting point to help management, engineers, production associates, schedulers, suppliers and customers to recognize waste and identify its causes. As a result, VSM is primarily a communication tool, which is also used as a strategic planning tool and a change management tool.

VI. ANALYSIS AND INTERPRETATION

VSMs are used to map work processes, material flow, and information flow. They have a multitude of uses and are generally easy to create and understand. For this project, we used Microsoft Visio to create current state and future state VSMs. Our first objective was to create a current state VSM for the CIS factory. To do this we initially created multiple current state VSMs. For the future state VSM, we created multiple scenarios, which were used to make a final decision. For the maps, the "value stream map" template within the Visio 2007 program was used. We then listed all the processes included for the corresponding production line. As shown and described in

the figure below, we used the different symbols to create our VSMs.

I. MAPPING THE CURRENT STATE (VSM)

Rother and Shook (1999) has discussed that mapping helps to see the sources of waste in the value stream. The extended value stream mapping includes suppliers and customers in their decisions to suggest Future state value map. Collecting and analyzing data from the information and material flow will aid you in improving the value proposition you offer the customer. A current state map starts by drawing the material flow and then by drawing the information flow. A current state map is drawn on a single sheet of A3 paper, and can be done initially as a ‘brown paper’ exercise.

Further many research scholars speak out that it is possible to identify and eliminate waste. In this connection, it was felt that the Patient work flow process was having some non-value added elements which can be avoided. Hence as per the model suggests the study was carried out. VSM is a visual tool that integrates material and information flow into critical path chart to understand the relationship and the importance of all value added and non-value added actions. This methodology enables the production office to prioritize the process for systematic lean techniques.

II. ANALYSIS FOR THE FUTURE STATE (VSM)

The bottlenecks were identified in the preliminary test and dilatation process as a maximum number of patients wait for a long time in this process. The reason behind the bottleneck was identified to be the transfer of medical records; it took time for the medical records to move from one table to another as it was maintained manually. This can be reduced by adopting new technology in the process system.

The plans of action for improving the Future state value stream mapping (FVSM) are:

1. To develop a new layout where the continuous flow of materials is possible. This will lead to a better way to reduce the cycle time of the patient.
2. To review the process flow in order to reduce the idle time.
3. To identify value added and non-value added elements and minimize/eliminate the non-value added elements.

III. PROPOSALS FOR FUTURE STATE (VSM)

It was proposed to suggest the following steps to be taken to implement a FVSM, in this merger it was decided to provide suggestions based on understanding and

observation of current state mapping. It was observed from the literature survey that the non-value added activity is performed by workers that do not add value to the service. These activities are considered to be wastes. Lean manufacturing tools will strive in eliminating these activities and, in turn, eliminate the waste in the process flow.

FVSM for the patient work flow process is drawn, however, a sample proposal is shown in Fig. Since these steps have to be taken up in phased manner, the proposed FVSM indicates the process that can be avoided and improve the value added activities by reducing non-value added activities.

Tables:

TABLE 1: ANALYSIS OF VALUE ADDED AND NON-VALUE ADDED TIME

SL.NO	ACTIVITIES	VALUE ADDED TIME	NON-VALUE ADDED TIME
1.	RECEPTION	1 min	2 min
2.	REGISTRATION	7 min	10 min
3.	CASH COUNTER	2 min	1 min
4.	PRELIMINARY TEST	15 min	35 min
5.	DILATATION	30 min	20 min
6.	DOCTOR'S EXAMINATION	10 min	15 min
7.	NECESSARY TEST	15 min	25 min
8.	DOCTOR'S CONSULT	5 min	20 min
9.	PHARMACY	3 min	10 min
10.	COUNSELLING	10 min	15 min
Total time		1 hr 38 mins	2 hrs 33 mins

Description for the tables

Fig 6.1: CURRENT STATE MAP

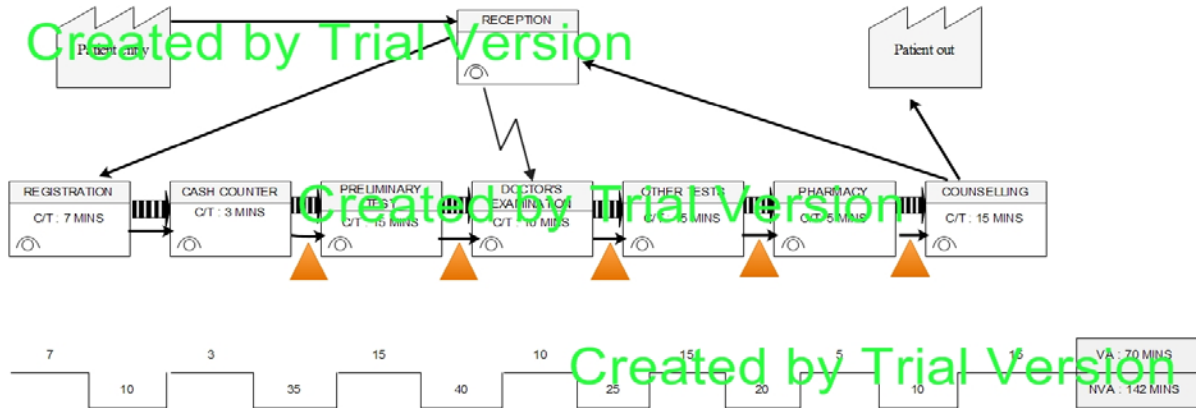
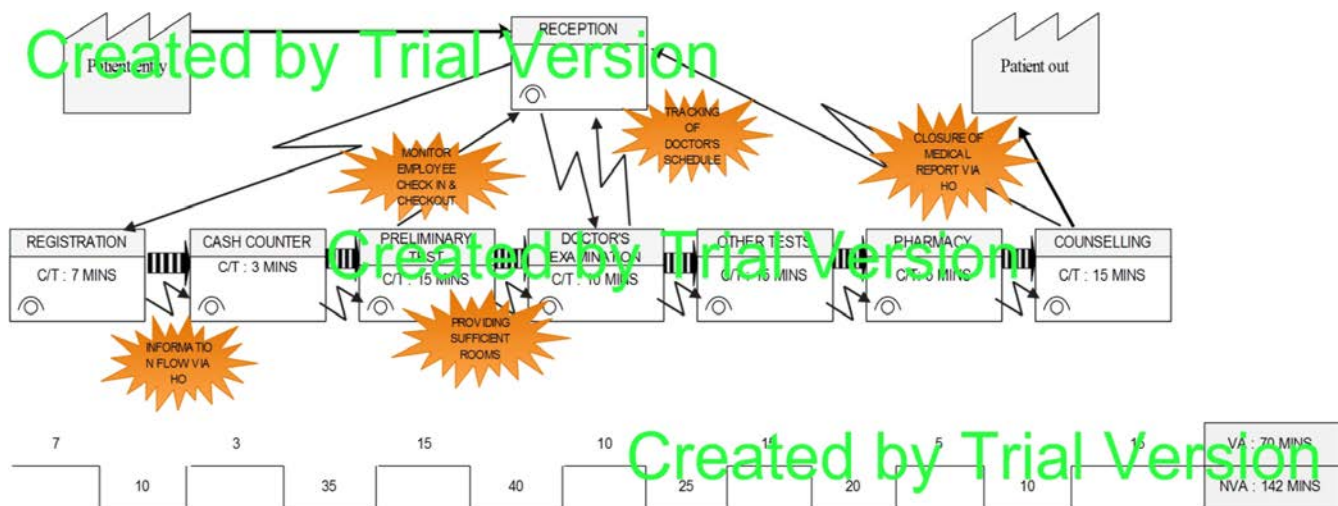


TABLE 2: PROPOSAL OF FUTURE VALUE STREAM MAPPING

SL.NO	ACTIVITIES	VALUE ADDED TIME	NON-VALUE ADDED TIME
1.	RECEPTION	1 min	2 min
2.	REGISTRATION	7 min	10 min
3.	CASH COUNTER	2 min	1 min
4.	PRELIMINARY TEST	15 min	20 min
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Total time		1 hr 38 mins	1 hr 33 mins

FIG 6.2: FUTURE STATE MAP



VII. CONCLUSION

Lean thinking has become increasingly significant in the field of healthcare and this study proves that implementing the same makes a vast difference in value added time. From the study, it is proved that we can increase the value added time and reduce non-value added time. Thus, the healthcare industry must implement lean thinking if they need to satisfy their customers.

VIII. SCOPE OF STUDY

India is a land full of opportunities for players in the medical devices industry. The country has also become one of the leading destinations for high-end diagnostic services with tremendous capital investment for advanced diagnostic facilities, thus catering to a greater proportion of the population. Besides, Indian medical service consumers have become more conscious towards their healthcare upkeep. The diagnostic lab services have been witnessing an increase in the number laboratory tests being outsourced to India. The coming years will see a rise in the share of the organised players in the diagnostic services market. The favourable demographic virtues offer an attractive market for healthcare providers and investors in India.

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