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Layout Improvement Through Lean Tools Application For Healthcare Facility

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ABSTRACT

The basic function for using lean as a waste removal tool was to improve the throughput time in the huge manufacturing world. Lean was a concept only utilized in the manufacturing sector although it has also found its way in healthcare sector. This article uses value stream mapping as a tool to reduce patient wait time as well as increase customer and staff satisfaction by lowering their stress levels. The proposed model will take into consideration the synchronization and movement of patients as well as efficiency of staff.

KEY WORDS: spaghetti diagram, value stream mapping, lean, quality of healthcare

I. INTRODUCTION

Satisfying customer's expectation is of foremost priority of every service industry. To provide customer with the appropriate service without any waiting time forms the basis of lean tools. One of the basic lean tool is 5 S namely Seiri (sorting), Seiton (straighten), Seiso (sweeping), seiketsu (systematizing), Shitsuke (standardizing). [1]

We have proposed a new methodology that can be categorized as the pull system rather than the push methodology which was earlier practiced in the healthcare facility. Pull system is typically based on the theory that material replenishment is triggered by consumption. Pull system helps reduce storage, waste of handling, repair, rework and excess handling. Continuous improvement is something always needed to keep the processes in flow and management in line.[2]

For us to implement lean in healthcare facility we start by identifying value added, non-value added and value enabling activities. Eliminating a non-value added activity will not affect the outcome of source.[3] But it will reduce the time required to complete the process. Value enabling activity does not add value to the process but is important for value added activity. Lean thinking deals with actually finding the root of the problem by using the root cause analysis it helps us simplify.[4]

Processes reduce non value added time and merge steps together. Lean initiatives began to be used to reduce inventory and processing time. As healthcare is more concerned about treating patients, lowering other wasted time will increase efficiency and allow nurses and doctors to give more time and attention to patients. In a flow chart, identifying the triggered event to any process is of utmost importance.[5]

VSM is used to analyze, design and manage flow of materials. VSM categorizes waste in many categories such as overproduction, waiting for processing, transport, over processing, inventory, inventory, unnecessary motion, rejection and idle people. In VSM, we need to start the process by creating current state map with the use of various symbols and conventions. It consist of 3 parts a process map, timeline and information flow. [6]

VSM can be used for multiple process levels it highlights waste and its sources by making hidden decision points apparent. Processes that create a bottleneck situation must be considered first for optimization as the bottleneck situation has an effect on the overtime process. [7]

II. GENERAL PHYSICIAN OPD SITUATION

The medical hospital given in this study is located in a large city of Pune in the area called Bibwewadi situated near the Pune-Satara highway. The hospital has a large population of patients from the nearby smaller towns namely Satara, Kolhapur, Nashik etc. As the hospital is a multi-purpose facility, a large number of patients visit the hospital on a daily basis. The types of patients included the new patients with an appointment, the follow-ups with an appointment, the walk-ins and the emergency patients who are sent to the casualty directly. For the purpose of this paper three MD physicians are taken in consideration working on the time basis of 12 to 4, 4 to 6, 7 to 9. Casualty department and other specialist doctors are not taken into consideration. Patient dissatisfaction and financial crunches of the organization were the major reasons to improve the system. The only option available to the hospital was to increase efficiency. Synchronizing patient flow was also important to carry out the process in a systematic manner. [6]

III. CURRENT STATE OF THE HOSPITAL

The patients flow can be categorized as the following, the patients who take prior appointment directly go to the reception to confirm their presence on arrival to the receptionist .After, this the patients wait in a waiting area where they sit on the benches waiting for their turn , the receptionist calls off the name of the patient and then the patient enters the OPD for doctor consultation, after the doctor consultation the patient again moves to the cash counter for the payment and further moves to the pharmacy. Some of the patients are recommended to conduct a test and follow up immediately to the doctor in such cases the patients are adjusted in between the queue for the follow up of the report. Some of the patients visit the doctor on last minute these patients are adjusted after all the appointments are done of else adjusted in between if all the successive appointments did not turn up. The emergency patients are directly sent to casualty where the assistant doctors attend the patients for preliminary health aid and if needed maybe recommended to admission or the doctor's appointment. The appointment scheduled for each patient was at a gap of 15 minutes. Data analyzed shows that the average time taken by a doctor for a follow up patient is 11 minutes and for a new patient is 17 minutes. According to the data, there are approximately 60% of follow-ups and 40% are new. Hence, the appointment time is appropriate.[6]

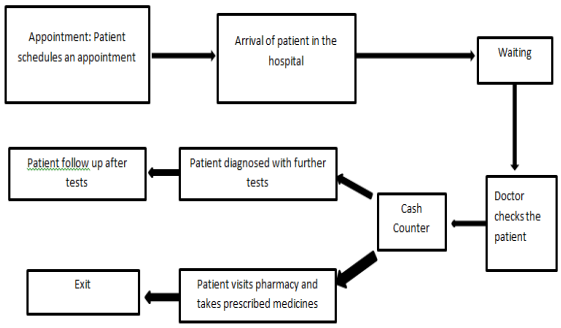

Figure 1.Problems observed in the process

The patients visiting the doctor were confused with the layout of the hospital. They get confused while visiting the facility to find their way to the OPD department because of the lack of directions. Patients had to ask staff of the hospital for each and every direction of the departments.

The recording system in the register seems a little too haphazard while recording the presence of the patients in the hospital in the queue. The scheduling of the appointments lacks proper planning and even the documentation of the appointments is not satisfactory. The appointments of all the doctors even the visiting doctors are written onto the same document which creates a lot of confusion.[8]

All the patients are made to wait in one single waiting space even if they are visiting different doctors which lead to an unsynchronized flow of the patients, unnecessary movement and disturbance in the system.[9]

Due to the far placed reception in the hospital the unnecessary movement of the patients is increased as they have to register their names at the reception counter and again come back to the waiting area which adds to unnecessary movement of the patients within the waiting area. The reception for OPD and casualty is one and the reception is located far from casualty which causes more inconvenience to the patients of casualty.

Due to absence of infrastructure in the hospital, all the doctors need to adjust themselves in the three cabins that are available even when there are a large number of visiting doctors. All the doctors need to adjust their appointments according to the availability of the cabins so as not to create much rush in the hospital for proper management of the patients.

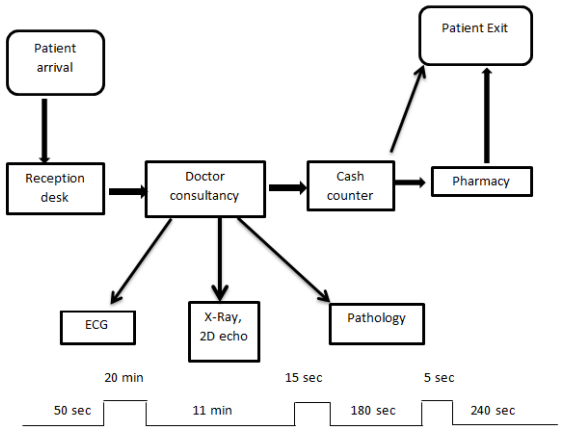

Figure 2.Value stream mapping

IV. SOLUTION:

In scheduling, care must be taken that register is properly bifurcated. Also every doctor should have different registers for appointments or at least different compartments in the same register. This will help in a quick overview of the appointments of the doctor and thus help in scheduling the doctor's day.

Placards should be kept at places which will ease the task of patients to find departments. And they won't have to ask the staff. Also the staff won't be disturbed unnecessarily. Thus it proves to be a winning situation for both, the patients and the hospital staff.[10]

Also the reception should be placed near the entrance rather than the current position. So that it can efficiently handle patients of both OPD and casualty. New people entering can directly find the receptionist and won't have to walk for any query.
People need to return to the waiting area after registering with the reception , this movement can be minimized by placing the reception in the beginning of the waiting area.[11]

Three different sections must be created so that appointed patients can have maximum priority, follow-ups after tests and walk-in patients. In case any appointment patient is absent walk in patient can be adjusted in between. Follow-ups can be adjusted in between appointment patients.[12]

The patients must be made to sit differently according to the doctors they visit so as to reduce the confusion and unnecessary movement of the patients

Each and every patient must be given a token when they visit the reception in the first place and a screen should be placed that displays the token number of the patient who needs to enter next. [13]

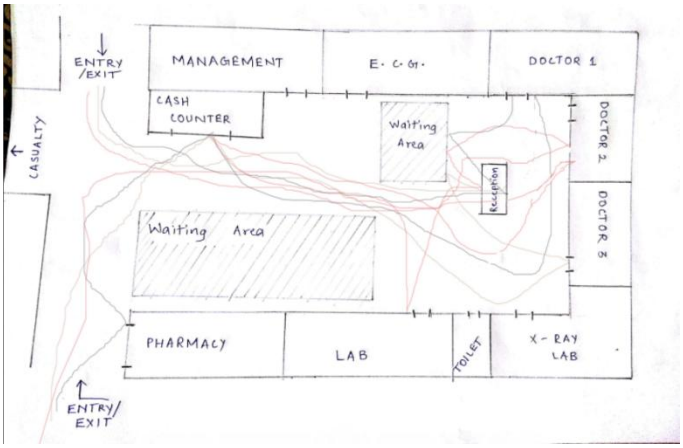

Figure 3. Spaghetti diagram (original)

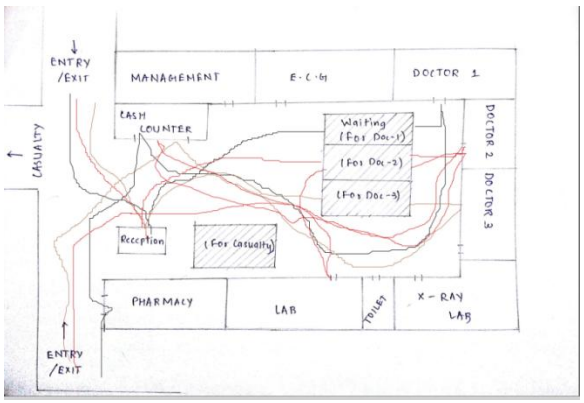

Figure 4. Spaghetti diagram (after the changes)

V. CONCLUSION:

Lean principles are always known to improve efficiency in manufacturing sector. Nowadays, it is also used in healthcare facility due to leading financial crisis and patient expectations. It leads to satisfaction of patients and also decreases stress levels of the staff. Systematic flow of patients and proper scheduling will ensure reduction in time taken. There will be reduction in chaos for both patients and

the staff. It will have a positive impact on treatment of patients due to reduced pressures on the staff. The process will get simplified by all these efforts. It may cause a bit of problem to both staff and patients in the start but with time it will benefit everybody!

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