

LEAN SYSTEM, THE BEST MEDICINE FOR HOSPITALS*Ruxandra DINULESCU¹**Laura Violeta VOICU²*

ABSTRACT : *From ancient times, hospitals all over the world, especially the ones from Romania, have tried to implement a method which would have the ability to eliminate the waste from processes.*

That method will be represented by Lean system and will be able to eliminate the waste starting with waste of time and medicines-the 2 most important priorities in the health industry.

Due to different approaches of this method, the waste from hospitals and clinics, started to decrease step by step, achieving objectives like patients' and medical staff's satisfaction.

Generally, the main target of the project is to find the right way to eliminate in proportion of at least 70% the waste from health industry. This action will be possible by accustoming the entire medical staff with Lean principles and main tools, so that they could turn into a Lean thinking, in order to contribute each of them at the improvement of health care system.

KEYWORDS : *Lean, Six Sigma, Health care.*

JEL CLASSIFICATION: *H111, H115, M11*

1. INTRODUCTION

Lean represents a management system, a philosophy or a toolkit, according to the amplitude, strategy and the development level of the organization and culture in which it applies.

Eliminating or reducing losses is specifically made, and it requires the ability of choosing the right instrument at the proper place and at the proper moment. No Lean instrument is generally valid, generally applicable and generally beneficial for the entire organization, regardless of the processes and activities. So, the Lean tools can be implemented only after certain preliminary steps have been completed, essential steps for their long term success. These stages are represented by solving cycle and by PDCA cycle. Usually, it all starts with the value stream analysis, and after that, a methodology for solving problems is applied, but only after a set of relevant indicators has been settled, in order to monitor the progress and the changes needed to achieve some clear objectives. It must be mentioned that before this process comes to life, several conditions must be created so that the improved results could become irreversible.

During the last years, Lean method has also created a path between its principles and sustainable development. Therefore, every industry that uses the Lean method, applies also a sustainable business development, in order to achieve a balance regarding the benefits both for environment, and also for economy ("The Journal of Bucharest College of Physicians and the Romanian Academy of Medical Sciences")

2. RELATION BETWEEN LEAN METHOD AND SIX SIGMA METHOD

In 1990, James Womack wrote a book called "A machine that changed the world". This book presented a history of the automobile's production and the American, Japanese and European production methods. What was new in this book, was the concept of "Lean Manufacturing".

Lean Manufacturing principles do not substantially differ from the principles of Toyota Production

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System. Though they include similar concepts like : production without loss (loss of time, money, materials, etc), Kaizen principle – continuous improvement, work cells, systemic vision of the company, quick setup of a new type of production line (SMED), etc.

What is different, is the way that this principles are applied in different kind of factories.

The essential concepts of this industrial philosophy appeared since the early 50s, mainly in Japanese enterprises and at Toyota company.

Based on the Just in Time principles at the end of last century, the concept of fluent production refers mainly to an organization's production relations.

Also, Lean Production can be seen as a philosophy of production that has the power to reduce the time between the customer order and the manufacture and delivery of the required product by eliminating waste of any kind. Compared to mass production, Lean production is “smooth” due to the fact that it uses less of everything, for example, it uses almost half of the manufacturing space, half of the investment, half of the time of designing a new product.

Improvement of quality and efficiency of products can also be achieved by using another tool called Six Sigma. "Lean" method originally appeared in the industry field, through the Toyota production system, and was centered on eliminating waste off all sort. As the time passed, the method was adapted also for services and expanded in all fields, including in health care system. Six Sigma was developed by Motorola. Her main objective was to reduce the quality products/offered services variance. This 2 theories have reunited in a single one, centered on solving customer problems.

When there is a fluent production, there must also be a very high level of processes, which could be achieved only by using the specific instruments, like:

- validation using statistical evidences
- statistical management
- the management of processes etc (Feyzzade, 2001).

Therefore, it can be approved that the Lean Management method integrates with Six Sigma. Though the trilogy of the objectives cost – quality – delivery period remained a constant of the enterprise, the way that they are attained has drastically changed in recent years. In the past, for achieving a low manufacturing costs, it was necessary to increase the productivity of the directly productive workers. On the other hand, in order to obtain a high quality, the activities of control have multiplied in all stages of production.

The philosophy Lean Management Six Sigma means to apply a systematic and structured approach in order to achieve improvements in remarkable progresses, no matter what business aspects there might be (Ohno, 1998).

Lean Six Sigma is also a combination of the two methods of quality improvement, being one of the most powerful and known trends in the last twenty years. It is not only a unique analysis, but is also a business process that allows companies to improve their profitability by creating and monitoring the business activities, daily, in ways that make all their best to minimize waste.

As the time went by, Lean management became useful in almost every industry. The latest industry in which this model was applied, firstly in USA, was the health care industry.

3. DEVELOPING LEAN MANAGEMENT IN HOSPITALS

Lean is already applied in other countries' health care systems, like USA, with very important results in reducing activities that do not add value for the customer and also it achieves in a more simple and faster way, the activities that add value to the medical service offer.

In an increasingly demanding business environment, more and more organizations are searching methods for improving the efficiency of their processes. In this case, we can find the hospitals.

In present, in Romania, the hospitals' managers do not know the right implications concerning the implementation of Lean method. Though, there have been held several classes about the importance of Lean in hospitals, very few hospitals try to implement it.

When we are using Lean method, it is indicated to follow the steps :

a. Value Stream Mapping

This technique, besides the fact that operates at a high level of abstraction, it also focuses on information management and physical transformation.

b. Lean Baseline Assessment

Lean can also be classified an assessment-based procedure. This means that in order to generate a report or a situation, the implementation team must use interviews, flow charts, process observation, etc.

Once the operation is completed, and the report is finished, specific changes and recommendations for improvements are being detailed in the assessment report.

c. "Critical Mass" Training

In every lean program, there must be a so called "critical mass" of employees, that need to be trained in the basics of the operating philosophy. No change can be implemented without this training.

d. Value Stream Planning

A normal value stream plan looks is represented like a cross between an action plan and a Gantt chart (a planning chart that depicts the expected duration of tasks). The main objective of the value stream plan is to set forth the work that will be conducted in order to improve the value stream over an entire year (Friedman, 2000).

Nowadays, every hospital search to implement 4 main objectives :

a. patients' satisfaction

b. eliminating waste (of every kind)

c. patients' safety

d. a good management of financial resources (Badea, 2005).

In order to achieve this goals, a hospital must implement the Lean principles.

4. OBJECTIVES AND RESEARCH METHODOLOGY

During the last 3 years, we have tried to find different ways in order to present the hospital's managers, the advantages that Lean method could bring for their institutions.

First of all, we have made a questionnaire, based on a set of questions, which have been distributed through hospitals, at patients and also, for medical staff.

In this questionnaire all people had to answer on a scale from 1 to 4 (1-unsatisfactory, 2-medium, 3-good, 4-very good). After that, all the answers have been gathered, and then divided at their number, making this way, a proportional average.

Along with the director of a Romanian state hospital, we have decided to interpret the answers according to the following percentage :

- 0-4.5 points => the hospital presented big difficulties, with an insecure level of resources' waste, and a high level of unsatisfactory both from medical staff and from patients.
- 4.5-7 => the hospital presents a medium situation but also with the need of improvement.
- 7-10=> the hospital presents a good situation regarding the keep of their resources. The waste is almost none and patients are treated in good conditions.

Here we will present some of the most important questions from the questionnaire :

1. Does the manager provide conditions for the proper functioning of the clinic ?
2. The managers recognize and emphasize the medical staff's efforts ?
3. Is medical staff encouraged to attend Lean training ?
4. Does the medical staff treats every patient equally, regardless of their social condition ?
5. The employees are motivated (socially, financially,etc) ?
6. Does the clinic care about patients' point of view ?
7. Are there sessions held on each section, in order to determine if there are different issues ?

The main objective of this questionnaire was to present a general view of a Romanian hospital, of its deficits and needs, of problems that could be solved by applying the right management tool and also, of the results that could be gained by improving different processes.

As the implementation of this test was over, the hospital received the following main results :

- concerning the leadership, it has been evaluated an average of about 5.5 points. This result indicated a medium situation with the necessity of improvement.
- concerning the medical staff satisfaction, we have obtained 4.3 points. Also, a result that does not pass the medium line.
- concerning the patients' satisfaction, we have obtained 5 points. Despite several deficits, Romanian hospitals still keep on of the best doctors in the world.
- concerning the waste of medicines, unfortunately, the hospitals had an average of about 4 points, which means that more than a half of medicines are thrown away each year (too many, too expensive, etc).

As these statistics were made, the Lean method has been presented to the manager. Through this presentation, it has been shown that if he wanted to use it, he could start by simply applying one of the main tools of Lean method, called "Five S".

With the help of this tool, the manager had to aim five simple pillars, like sort (remove unnecessary items, prevent accumulation of these unnecessary items, remove processes not used), straighten (prevent loss and waste of time-especially for patients), shine (keep the hospital clean, making it a safe workplace), standardize (trying to maintain everything in order) and sustain.

First of all, a training has been proposed for his employees, in order to explain them clearly how Lean works in an institution and what are the main advantages. After that, they could start implementing all five pillars, one by one. So, by the moment, he would have obtained a gain from one pillar, he would go to the next one.

Another example of successfully applying Lean method is at a clinic from Bucharest. In almost 80% of cases, all patients have to wait on the lobby, before entering a specified doctor. In this case, beside the crowd that is forming (because there are days when there are also coming patients with different emergencies, and they have priority) ; there is also a huge waste of time. This waste represents the time between the moment when the doctor finished his consultation and holds on for the patients to dress, to arrange their staff, etc. This action takes about 10 minutes, 10 minutes when the doctor just waits for the patient without doing anything.

So, seeing this at one of my family members, I decided that there must be a way to eliminate this so called "dead time". After reading about some hospitals from abroad, which succeeded in eliminating the waste of time, with the help of Lean method, I decided to present to the doctor, the tools which could improve the productivity. Our main goal was to eliminate those 10 minutes (if the doctor has an average of 20 patients per day, and if every patient stays in the cabinet for dressing, about 7 minutes, then the wasted time is equal to 140 minutes, almost 2 hours and 20 minutes, considering that a consultation takes about 20 minutes).

Measuring these facts, we have proposed to him to try and reserve another room, where consultations could be held, for the same doctor.

The principle was the following : when the first patient comes in, the doctor will consult him. After 10 minutes (counting that the patient is still in the cabinet), the assistant invites the second patient in the other room, in order for him to undress the baby and prepare for consultation. When the doctor finished the consultation for the first patient, he could go directly in the other room, to see the second patient. In this way, having 2 rooms available, the doctor does not have to wait those 10 minutes (and also the first patient can dress without hurry, while the doctor is already in the other room).

5. RESULTS

By applying the questionnaire method, along with "Five S", one clinic and one hospital from Romania have seen the effects that Lean system could have over their management.

The medical staff will be trained in order to achieve more knowledge of how Lean system could help them. Meanwhile, first results have been already seen :

- eliminating waste of time => a reduction of almost 25% has been observed.
- increasing patient satisfaction => due to the diminution of waiting time, patients do not tend to blame the doctors so much as they did before.
- more time for doctors to cover a larger number of patients.
- cabinets are more organized ;
- financial savings => due to the fact that is has been decided to buy exactly what will be consumed (example the vaccine for flu)
- increased productivity

In the future, there must be established a plan that would be able to redesign the health care system around the patients' needs in the first place. This way, the providers and medical staff will be on the second level, and however, the patients' focus, will also be a support for medical staff.

6. WHY IMPLEMENTING LEAN SYSTEM IN A ROMANIAN HOSPITAL-MAIN ADVANTAGES

Nowadays, hospital's managers are trying to find the best solutions in order to increase the productivity, patients' and medical staff's satisfaction, waste of resources, etc.

Lately, a state hospital from Bucharest, called "The children's hospital Grigore Alexandrescu" tried to implement, step by step, some of the Lean's principles. In this way, the manager along with the medical staff, wanted to find possibilities, for eliminating waste of time, waste of movement, waste of medicines, and even waste of useless human resources.

For example, every year, they would order dozens of anti-flu vaccines. The stock was so big, and the number of patients was relatively small, fact that forced them to throw away dozens of vaccines. But, once they started to apply the Lean principles, they decided to order the stock as the patients would have made an appointment. This resulted not only in a lack of waste, but also, in a financial increase, with almost 15%.

With the help of this method, hospitals can improve not only their productivity but also their efficiency. Moreover, if the method is well implemented, hospitals can save a lot from their financial resources.

Here are some of the main advantages of this method, discovered also by applying it at the hospital already mentioned :

- human resources service is more properly organized (for example, if there are some assistants that are not able to arrive to work in a certain day, than, the rest of the assistants can take in charge the rest of the job) ;
- better sections' organization – in almost every hospital's section, the organization planning improved with 5%, due to Lean principles.
- improvement and processes' flexibility ;
- eliminating waste (eliminating everything that is not necessary for the health care system, like dozens of vaccines that in the end will expire and will end up by being thrown) ;
- implementation of new management systems for medical devices

All in all, the Romanian health care system , would have an important start-up if they took the time and start implementing the Lean system. This evolution would be proper not only for the medical staff, but also for the patients. In this way, both of them would reduce waste and would gain time.

The starting point of changes in hospital is its strategy. In order to be efficient, the health care system must establish short and medium term goals, along with the sustainable development, which

can be achieved by all members involved in the economic activity (Eckes, 2003).

Here are one of the most important factors that are able to determine the change:

- Motivation: is the key element of changing in a hospital's culture. It can be easily created by applying an important level of motivational management. This concept can be seen as a notion of progression.
- Team spirit: every staff member must work not only for his own good, but also for the good of the entire team. When the team has good results, the whole hospital earns a good reputation.
- Training: Medical staff must be trained in order to understand the principles of Lean management. They have to be sure that by adopting this system, the productivity will increase and the results will be higher than expected.
- Communication: For example, if something went wrong, the medical staff must inform the higher superior, who will be able to solve the issue, by using one of the Lean principles (Boissonat, 1996).

7. CONCLUSIONS

In the current development context, Lean management would be a problem solving element for Romanian hospitals.

Based on the surveys made in "Grigore Alexandrescu" Hospital, the following results have been obtained :

- productivity increased with almost 15% ;
- financial resources increased with 15% ;
- waste has been eliminated from 70% of the processes ;
- better organization, etc.

With the help of Lean system, hospitals from Romania will be able to be aligned with the abroad health care institutions, by completing more tasks with fewer resources.

By adopting Lean principles, the entire health care industry will be changed ; medical staff would be able to better manage their time and work with more efficiency, and patients will receive a more attention along with the escape from a bureaucracy system (Enachescu, 2004).

However, the actual project is just at the beginning, and though improvements have been observed, the Romanian clinics and hospitals still have a long journey to take before reaching the European hospitals' results.

Therefore, with a complex research, we will try to implement and discover the best Lean tools for increasing hospitals' productivity and eliminating the waste from medical health care system.

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