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Identifying the Wastes from the Romanian Healthcare System using the Lean Approach

Cosmin DOBRIN¹, Ruxandra DINULESCU², Adriana DIMA^{3*}

Abstract

Objectives: The following paper aims to present a part of the issues with which the Romanian healthcare system copes, from a Lean methodology point's of view. The main objective is to identify the actions and medical processes that do not add value for the patients and how could be reduced or even eliminated. Prior work: The Romanian hospitals and clinics need to offer the best experiences for their patients. In this way, and studying the models from American and European hospitals that already adopted Lean methodology as part of their every day job, introducing Lean to Romanian healthcare system represents a way of transforming a blamed system into a representative model. Approach: The paper relies on facts and actions that take place in public hospitals and clinics from Romania. After observing for a couple of years the patients' behaviour and their needs, through surveys and direct interviews, we have arrived at the conclusion that the Lean method could be an efficient way of improving the Romanian healthcare system. Implications: During the study, researchers have involved in observing and understanding waste in the healthcare system. Value: The paper presents a new vision for improving and better organizing the Romanian healthcare system.

Keywords: *Lean management; sanitary system; waste; pull system; push system.*

1. Introduction

Every healthcare system nowadays needs to adapt as much as possible to its patients' needs since it represents an important part in their

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everyday life. This is also valid for the public Romanian healthcare system. This system has been criticized a lot, mainly because of the conditions offered by public healthcare hospitals and clinics and because of a high level of bureaucracy and wasted resources.

Therefore, the main purpose of this article is to define the seven types of wastes existing in the Lean methodology, see if they apply also to our Romanian healthcare system and find out what needs to be done in order to assure a high quality healthcare system through Lean tools.

When we think about a qualitative healthcare system we can imagine a system with zero defects or errors that might result in treatment errors, patients' dissatisfaction, or claims came from patients. This is way a qualitative healthcare system should be oriented on lower costs and higher medical processes' level [3].

In order to achieve this apparently simple state, our healthcare system needs a revolutionary method that could bring efficiency and patients' satisfaction. We consider that a proper method could be Lean management.

Lean management represents an approach that targets an improved process quality and elimination of everything that could create waste and not adding value for the customer [2].

As we have said, one of the main objectives of Lean methodology is to ensure a high satisfaction level for the patients. This is why, firstly we will present, in Lean terms, what is more beneficial for our healthcare system, a "pull" or a "push system". Secondly, we will present the seven types of wastes. The first seven types of wastes (or muda – the Japanese term) were identified by Taiichi Ohno (1912-1990), the Toyota executive [5]. For the beginning we must identify these wastes and associate them with our healthcare system; this would be the first step. After that, we should take into consideration the medical processes where these wastes are present and in the end, presenting a Lean solution that is able to bring back patients' satisfaction and lower the costs.

2. Pull system versus push system in a hospital

As we have already mentioned, the first step in creating a Lean environment for the patient is to understand what that certain customer want.

Once we have a clear image about a patient's need, we can redesign the medical process in order to be able to be productive and in the same time, to ensure a minimum waiting time, minimum defects' rate and last but not least, minimum cost.

The main idea of a “pull system” is to only produce a product or deliver a service when the customer asks for it [1].

For better explaining the essence of a “push” system in a hospital, let’s have a look at the examples below that show how this kind of system is featured in the sanitary system:

A patient going to a lab for testing represents a pull signal;

When a patient leaves the doctor’s cabinet, that should be a pull signal for the doctor to sterilize the medical instruments for the next patient;

The vaccines’ orders made by doctors at patients’ requests represents a pull signal;

The medical home visits represent also a pull signal.

The main advantages for using a pull system in a hospital are:

Increased productivity (for example, doctors don’t have to repeat “safety” medical controls to patients, but only when they ask for);

Reduced inventory (doctors can order special vaccines only when the patients ask for them; in this way, they won’t order several dozes and realize that no one is willing to pay for them);

Increased flexibility;

Increased safety.

Now that we have clarified what the “pull system” would look like in a sanitary institution, let’s see what a “push system” looks like in a hospital.

In a “push system” the medical services or the production of a product is made based on a predicted demand (the push system works a lot with forecasted demands). This signifies that, for example, in the case of a family doctor, he will not wait until the patient orders the vaccine, but he will order several dozes, just in case (because maybe regarding the last year’s predictions, there were almost 150 patients that bought the flu vaccine). However, in a sanitary system, the push method might not always work. It is very possible that the demand from last year and the current demand won’t be the same.

The main disadvantages for using a push system in a sanitary unit are: Increased (or even exceeded) inventory; Unnecessary costs; Reduced safety, etc.

Therefore, even if in a manufacturing company there are cases when these two systems work together in order to ensure maximum profitability, when dealing with patients (in a sanitary system) the most adequate method is the pull system, since it is directly oriented on what the patient wants and especially, when.

3. The seven wastes of lean applied in the Romanian sanitary system

The seven types of wastes often described in Lean methodology and develop by Toyota focus on non-value-added waste, including all the activities that consume financial resources, time, and people, but without creating any value for the customer [1].

In the following paragraphs we will describe these seven types of wastes and after that, we will see how those apply to our sanitary system.

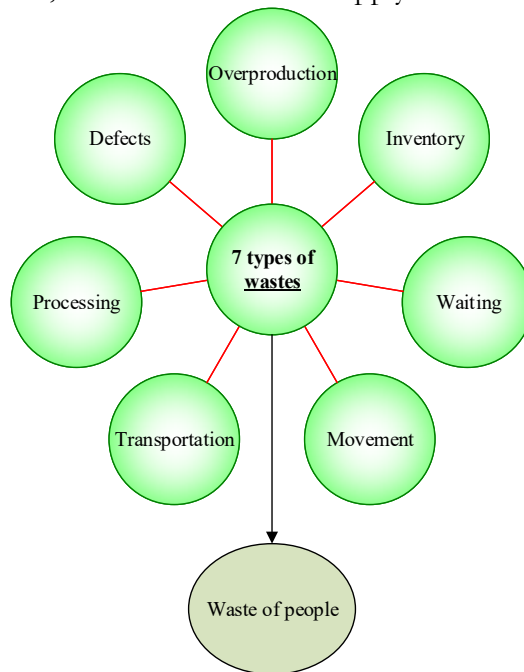


Figure 1. The seven types of wastes

In the above image, we have illustrated the seven types of wastes, plus one more, considered important by some Lean specialists, the waste of people, meaning the waste of talents or ideas.

However, we will start by describing them below and exemplifying how they appear in the Romanian sanitary system:

Overproduction – this type of waste appears pretty often in every healthcare system, not only in the Romanian one. Overproduction means that the healthcare unit or the medical suppliers produce more than the patient needs. This type of waste directly influence all the wastes, as seen in the schema below:

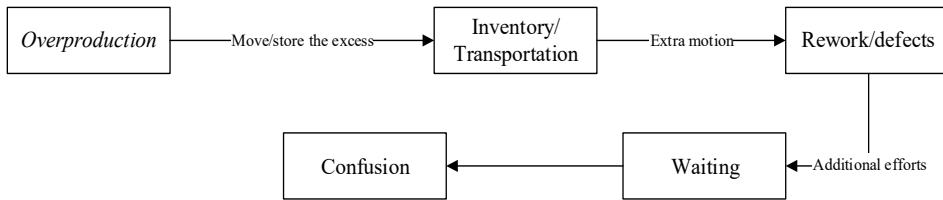


Figure 2. How overproduction leads to other types of wastes

The above figure represents a common case of overproduction and its effects. Basically, the overproductions will necessarily a place for storing that excess or moving it, action that will cause an unnecessary inventory or unnecessary transportation. This inventory will result in an extra motion which will determine additional reworks or even defects of that process. If the process has defects, automatically needs to be repaired, so it will result in additional efforts which will engage in waiting time, creating in the end, confusion regarding that process.

In the Romanian sanitary system one example of overproduction is represented by the annual distribution of anti-flu vaccine to the family doctors' cabinets. The institute that produces the vaccines supplies a large number of dozes, every year, even if they don't have a statistic with the average number of patients that desire the vaccine (even if the vaccine is free of charge, not every person wants to vaccinate). The generalists receive the dozes and almost 20% of these aren't used, are causing inventory and in the end, are thrown away because they will expire.

A solution could be to maintain the evidence, every year, of the number of patients that take the vaccine and based on this statistic, the institute could send a certain amount of dozes.

Inventory – inventory appears, as we have already mentioned, because of overproduction. When the sanitary institutions produce or process more than it is needed (overproduction), inventory appears. The main disadvantage of this inventory is that it requires space for deposit and sometimes, additional costs.

If we refer to the example above, when the doctor receives the vaccine dozes, he has to deposit them in the fridge (the vaccine has to stay at a certain temperature before being administrated to the patients). Therefore, instead of occupying the place in the fridge with other medicines, the doctor will occupy it, more than a half, with anti-flu vaccines that will stay until the stock will finish (some dozes remain in the fridge until the expiration date and then they are thrown away).

Waiting - a very often type of waste seen in the Romanian health care system is waiting. This could be observed especially for the patients.

Waiting represents a non-adding value for them: waiting for the results (more than anticipated, waiting in front of the doctor’s cabinet, waiting in line, waiting for an appointment and so on).

In order to determine the main reasons for waiting in the Romanian sanitary system, we have constructed a Fishbone diagram (a very useful Lean tool for determining the root cause of a problem):

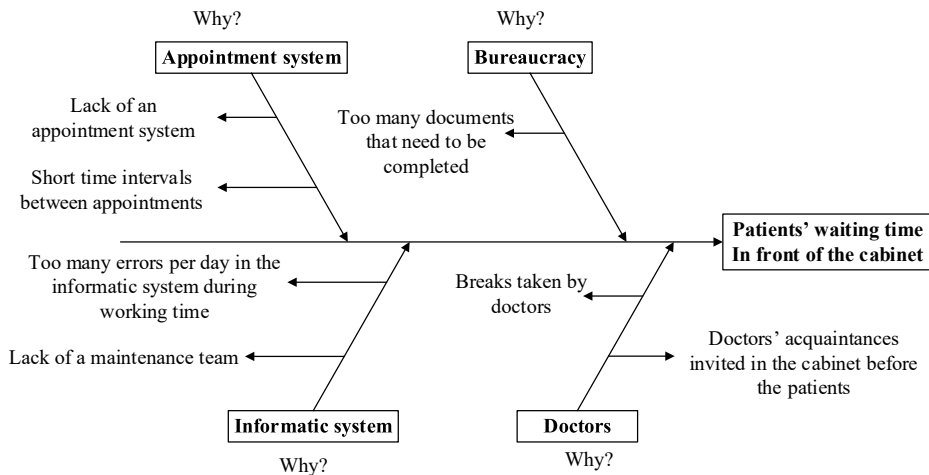


Figure 3. Fishbone diagram for explaining the patients' waiting time

In this diagram we have exemplified the main root causes that lead to waiting time for Romanian patients. By building the Fishbone diagram, we have constructed the analyses by asking “Why?” several times, in order to find out the cause. As it can be observed, we found out that in the Romanian sanitary system there are four main causes that lead to waiting time (the appointment system, bureaucracy, the informatics system and the doctors).

In a study conducted recently, we have observed the main causes that lead to waiting time for patients (in this way we were also able to develop the above Fishbone diagram) and beside that, we have also figured out which of these causes has the more influence on creating a waste of time. The result can be seen in the below Pareto diagram:

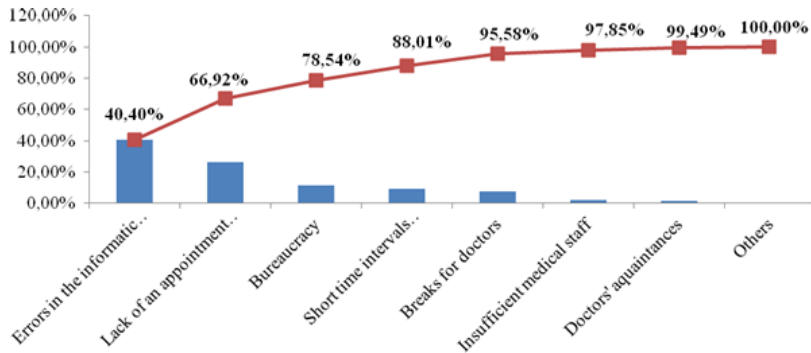


Figure 4. Main causes that lead to waiting time

Based on the diagram, the main causes are errors in the informatics system, lack of an appointment system and bureaucracy. These three causes create a waste time in a proportion of 78,54%.

Transportation \neg – or unnecessary movement for patients represents as well a non-added value very often seen especially in the emergency departments. This type of waste can be translated, for example, by moving the patient from a floor to another, or from department to department in order to be finally examined by a doctor. This kind of waste will require a lot of wasted time from the patient.

For example, in the emergency department, when a patient arrives, firstly he/she has to wait for registration; after that a nurse will come and take the patient to the doctor; if the doctor recommends further investigations, the patient is usually moved to another floor for investigations; the patient waits for the results; after that, the nurse return with the patient to the doctor (the patient waits again for the doctor) and so on until the patient has been diagnosed and send home.

Movement – this type of waste is similar with the one described above, the only difference being the fact that it appears mostly for the employees.

In Romania, especially in the public health care system, the clinics and hospitals are not very well organized and because of this the employees have to walk distances between doctors' cabinets.

Over-processing – over-processing usually appears when the healthcare institution produces a process or a medical action that does not add value for the patient.

An example of over-processing frequently met at the public Romanian clinics is the moment when the patient comes at his family doctor for an appointment and after consulting the patient, the doctor has to fill in exactly the same information about the patient and his treatment in three

different places (as we have already mentioned, the written information is identical, but written in three different places): the patient's electronically record, the patient's physical folder and the doctor's consultation register. The doctor is forced to do so (not only to complete the information in the informatics system) because when a medical control comes, they will check the paper files.

In the first place, this action represents a waste of time for the patient, and in the second place, a high level of bureaucracy in the Romanian healthcare system.

Defects – unfortunately defects are very often met in the Romanian healthcare system. We can observe defects like doing something that is not correct, or spending time on searching a missing medical item, or even medical errors caused by lack of attention from the doctors, or even a wrong treatment.

People – some Lean specialists consider also that waste of human potential becomes a more and more observable. In Romania, this kind of waste is often seen when medical employees' ideas about how their work might become more efficient are not taken into consideration or ignored.

Because of this fact, the nurses or any other employee from the hospital may feel like they are not considered an important part of that certain institution and therefore, they stop sharing their ideas and just comply with their work.

For example, in Romania we have a considerable number of generalists that go out from the university. In the graph below, we can see how many generalists are in some of the biggest cities from Romania:

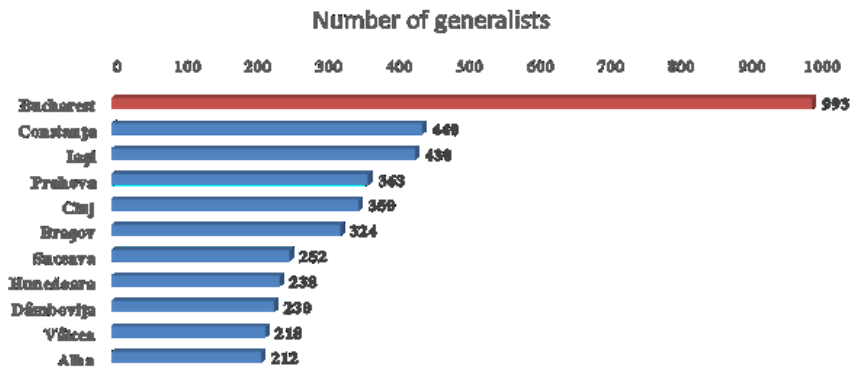


Figure 5. Number of generalists across different cities from Romania (<http://www.cnas.ro/casmb/map-location/idCounty/52>)

However, almost half of them decide to leave the country from various reasons like small salaries, improper work conditions, lack of modern equipment in hospitals, lack of interest from their managers, etc.

Here are some concerning facts about nurses' and doctors' migration, based on a study made by Foreign Investment Council:

At every 5 hours, a Romanian doctor leaves the country;

From 2007 until now, approximately 14.000 Romanian doctors chose to work in another country;

In 2016 almost 2400 specialists left the country;

Romania has a doctors' migration rate of 9%, while the European average is only 2,5%;

Almost 67% of students from the Faculty of Medicine intent to leave the country after they finish school.

4. Tools for avoiding the waste in the Romanian healthcare system

Based on the above analyses regarding the eight types of wastes, we have seen that the Romanian healthcare system “successfully” finds itself in all of them.

Eliminating the processes that cause those defects won't be easy, still there must be a starting point for organizing and bring efficiency to the healthcare process.

Regarding the examples above, we have listed the Lean tools that can help eliminating the wastes mentioned:

a) For fixing inventory – we can use instruments like 5S (sorting, set in order, shine, standardize and sustain);

b) For avoiding overproduction – just in time (JIT), a method that helps us produce based on the customer demand;

c) For avoiding waiting – a proper tool would be the “root cause analyses”, a tool that focuses on solving the root problem/error, instead of treating the immediate symptom;

d) For avoiding transportation and movement – we can use “value stream mapping (VSM)”, which helps us in understanding the steps of a certain process and also observe where the non-adding value appears for the patients;

e) For avoiding the over-processing – a tool easy to be used in this case could be the ”5 WHY-s” method, that can help us asking the question ”why” several times, in order to find out the main reason why over-processing appears in the healthcare system;

f) For avoiding defects – in this situation, we could implement a "poka-yoke" method (mistake proofing method);

g) For avoiding waste of people or their talents – for this part, every healthcare institution should rely and take into consideration the employees' ideas, in order to create a satisfying environment for the patients.

5. Conclusions

Lean methodology is about people, and most of all, is about the customer, in this case, about a patient. When a patient comes to a hospital or a clinic and leaves with some sort of aversion about the staff or about the medical processes that he took, this means that something is missing, or something is not done the way it supposed to so that patient could leave satisfied with his choice.

This is why we consider that the Romanian healthcare system needs a reinvention, a method easy to understand by the medical staff that could lower the rate of producing waste of all sorts.

In conclusion, the Romanian public health care system still has a lot of broken issues, which require immediate treatment, and some of them, even immediate elimination.

Applying the Lean tools will not change an entire system over night. Applying the Lean methodology and expecting instant results, means that the whole concept is misunderstood by the medical staff. Healthcare suppliers need, first of all, to understand the Lean concept, in order to work with it. Hospital managers need to involve all the medical staff in presenting ideas about how the process could change in order to ensure the patient's satisfaction.

Lean is about seeing the "the big picture" and then analysing, process by process, what could be done in order to improve a certain action.

The Romanian public hospitals and clinics are still producing errors. Besides high inventory or hours of waiting time in front of the cabinets, there are still deeper medical errors that, sometimes, even produce death.

This is why a "lean healthcare system" should be a system that rearranges the processes in order to avoid the non-value adding for the patients, and this is what Romanian hospitals and clinics need.

References

- [1]. Arthur J. Lean Six Sigma for hospitals: Simple steps to fast, affordable, and flawless Healthcare. New York, NY: McGraw-Hill; 2011 Feb 22.

- [2]. Furterer SL. Lean six sigma case studies in the healthcare enterprise. Springer London; 2014.
- [3]. Juran JM, Blanton AG. Juran's Quality Handbook. Fifth. 1999.
- [4]. Womack J., Jones T. Lean thinking-Banish waste and create wealth in your corporation. New York: Free Press; 2003. 15-20.
- [5]. Womack J., Jones T. Le lean au service du client. Paris: Ed. Vuilbert; 2006.