THE IMPLEMENTATION OF LEAN PRODUCTION IN HEALTHCARE

Abstract. Lean production is a management system created more than 50 years ago as a Toyota production system. Today lean production is widespread in many countries of the world. In healthcare lean production allows to eliminate problems that are associated with insufficient financing, poor quality of services.

Keywords: lean, healthcare, implementation, wastes, lean production, medical organizations.

The concept of lean production can be considered as a set of tools that allow creating maximum value for the customers by reducing wastes. This concept is aimed at fundamental changes in organizational thinking which certainly leads to the transformation of the organization's activities.

Lean production is a management system created more than 50 years ago as Toyota production system (TPS). It is important to note that some authors consider lean production as a method of improving the economic safety of different organizations [3, p. 2].

There are many definitions of lean production which reveal main features. According to Wahab A.N.A., Mukhtar M., Sulaiman R. lean manufacturing, or also known as lean production, has been one of the most popular paradigms in waste elimination in the manufacturing and service industry [4, p. 1292].
In the health sector this concept is considered as a way to increase the effectiveness of health organizations on the basis of a reducing wastes. Wastes in healthcare are those actions that do not add value to the patients (for example, waiting time).

Taiichi Ohno could understand and analyze the wastes that usually occur in production and which must be eliminated. Wastes can also be considered on the example of health (see Table 1) [5, p. 5].

<table>
<thead>
<tr>
<th>Wastes</th>
<th>Examples of Healthcare Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>Staff walking to the other end of a ward to pick up notes.</td>
</tr>
<tr>
<td>Inventory</td>
<td>Excess stock in storerooms that is not being used.</td>
</tr>
<tr>
<td>Motion</td>
<td>Not having basic equipment in every examination room.</td>
</tr>
<tr>
<td>Waiting</td>
<td>Waiting for patients, results, prescriptions and medicines.</td>
</tr>
<tr>
<td>Overproduction</td>
<td>Requesting unnecessary tests from pathology.</td>
</tr>
<tr>
<td>Overprocessing</td>
<td>Asking for patients’ details several times.</td>
</tr>
<tr>
<td>Defects</td>
<td>Repeating tests because correct information was not provided.</td>
</tr>
</tbody>
</table>

Management based on the concept of lean production is often described as a commitment to the principles of this concept and continuous improvement in quality. This improvement is based on lean tools (for example, VSM – Value Stream Mapping). This tool can help to determine the possible distribution of patients and calculate queue time. Based on the equation for queue cycle time [1, p. 51]:

\[
\text{Time}_{\text{in Queue}} = \text{Activity Time} \times \left(\frac{\text{Utilization}}{1 - \text{Utilization}}\right) \times \left(\frac{\text{CV}_a^2 + \text{CV}_p^2}{2}\right),
\]

where \(\text{CV}_a\) is input variation, which we may not control;

\(\text{CV}_p\) is process variation, which we want to minimize;
Utilization rate is Demand/Capacity (note to be “efficient” this should be 1).

Recently the healthcare industry has demonstrated success in applying lean production in the United States, Britain, Australia and Canada. Moreover, in Saskatchewan, Canada, lean tools have widely been introduced [2, p. 2].

Now we should consider the main factors that influence the successful implementation of the lean production concept: training of medical organization staff; support for the implementation of lean production by stakeholders; strong leadership and clear vision.

Lean production is the union of the three main components (structure, process, result).

Firstly, let us consider the component “structure”. Structure includes normative, technical and administrative tools that allow standardizing the operation of a medical institution for the effectiveness of medical care. Considering financial resources, the implementation of lean production provides a positive impact on the financial condition of healthcare organizations increasing opportunities for patient care. Another indicator of the structural component is human resources. It is possible to increase the number of annual operations without any increase in the number of staff.

The second component we need to look at is “process”. The participation and continued support of senior management should be interrelated and patient care process will be successful. Lean production involves the use of tools (value stream mapping, kaizen, a team approach to problem solving, 5S, kanban). These tools allow identifying wastes and integrating the stages of the most efficient and standardized processes.

The third component – “result”. Result of lean production in healthcare organizations is to increase the productivity and efficiency of staff, reduce waiting times for patients, reduce costs, improve the quality of services and increase access to medical care.
As we can see, lean production can be considered as a method that allows identifying and eliminating wastes in production processes, focusing on the overall quality. And the principles of lean thinking is widespread in various contexts of health (for example, radiology, orthopedics and cardiology services).

References:


