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Lean Production: How to Achieve

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When we talk about the term *lean production*, many people think that it is the fact that a company produces something while already thinking about how much it can sell by producing just that amount. In fact, this is not the case. Lean production is the act of producing so that there is no waste, or even with the least possible waste.

At first glance, the lean is a savings. In fact, lean production does not work to minimize costs, which can lead to a decrease in product quality, but to reduce the losses that exist in every workplace, regardless of the type of activity.

The main creator of *Lean production* is Taiichi Ono, who introduced this concept in the 50s of the last century in the Japanese company Toyota Motor Corporation [1].

According to Professor Peter Hines, consultant at SA Partners (UK), lean production helps to survive in the long term, when a company faces new competition and changes in macroeconomic conditions, making it more flexible and adaptable to changes. This concept allows a company to thrive with the same resources, often doubling its output.

The concept of lean production is now widely used not only in the automotive industry, but also in trade, services, utilities, health, education, the armed forces, the public administration sector and many other activities.

Keeping in mind that lean production is aimed at making the most possible use of minimal resources and avoiding

losses, we will pay attention to some of the tools among several that are part of the Toyota production system. They include:

Just in time. One of the main tools of the Toyota production system is the method of organizing production. This tool means that during the production process, the necessary parts are on the production line exactly at the time when it is needed, and in exactly the right quantity. As a result, the company consistently eliminates downtime, minimizes inventory, or can reduce it to zero. The main characteristics are the availability of only the necessary stock when necessary; improving quality to the state of «zero defects»; reduce cycle time by reducing equipment uptime, queue size, and production batch size; gradually improve both operations and their implementation with minimal cost.

5S program. A tool of the lean production system that can improve the production process, reduce losses, organize jobs, and thereby increase the productivity of the enterprise as a whole. It involves organizing each workplace using visual cues to achieve optimal performance. It is one of the fundamental tools of lean production. This method includes five main strategies: *sort; set in order; shine; standardize; sustain* [2].

The goal of 5S is to make the workplace more functional and more comfortable. This is done by placing tools and materials in logical places depending on who needs them, how often they are needed, and so on. Spaces are cleaned regularly. Cleaning and organization become habits. When used correctly, 5S ultimately makes processes safer, efficient, and more stable.

Kaizen: a lean production system tool that can improve the production process, reduce losses, organize jobs, and increase the productivity of the enterprise as much as possible .

The idea of the Kaizen concept is to continuously improve all organizational functions from production to

management. Kaizen is the basis of the concept of total quality management (TQM). The main goal of Kaizen is to change for the better by implementing various measures to reduce the level of losses in the organization. The essence of kaizen is the synergistic effect of combining the efforts of employees. Kaizen suggests that there is no enterprise without problems. Kaizen helps solve these problems by developing a work culture where each employee is not penalized for the problem, but ensures that it will not happen.

Kanban is a production process management method within the lean production concept that uses information cards to transfer a product order between processes. This tool provides an indication of production or product transition from one process to the next. The Kanban system is a way to optimize the production chain, starting from the first stages of forecasting demand for goods and ending with the distribution of tasks between production facilities. This technology, in turn, is aimed at optimizing the size of inventory and ensuring a high level of order fulfillment on time.

Andon is a multi-colored signal lamps (Andon-traffic lights), a Board or a digital display Board that use special messages to show specialists the location of the problem.

You can look at the operation of the system on the example of the Toyota concern plants. Each production site is equipped with a special cord for signaling. When a fault occurs, the worker pulls it, and the large display lights up yellow, which indicates that a defect has been detected in a certain area. The screen lights up in red, indicating that work on this section is suspended and the problem is being fixed. The main task is to achieve quality improvement, even at the cost of temporarily suspending some processes.

This allows you to respond to the problem in the shortest possible time. The foreman should not spend his time constantly monitoring production. The advantages are that you

can directly control the production, and the worker can help with a simple movement of the hand, so that the fault can immediately be analyzed on the spot and eliminated. Using the Andon, a worker can also indicate that they are, for example, overloaded and need help, or that there are security problems.

Andon indicates: the current state of the process on the machine, the occurrence of a malfunction (for example, lack of materials), actions (for example, setting up, cleaning the machine), and so on.

As a result of the implementation of the system of visual notification of emerging problems, companies achieve impressive results that are not available in many organizations that do not use Andon. Effective use of the Andon system is possible only if it becomes part of the philosophy of the company or organization as a whole.

The most important goals and objectives that the Toyota production system and lean production in general follow are to value each customer; to reduce delivery times, and to achieve the complete elimination of all types of waste [3].

Thus, lean production can improve the quality of goods and services provided, increase labor productivity and employee motivation, which in turn affects the growth of the company's competitiveness. This concept is still very young, but it is constantly being improved. The success of lean production is obvious, so its ideas are popular all over the world.

References:

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