



Implementing Lean Manufacturing and Solving Motivation Problems in Russian Companies

O. P. Maslova^(✉), T. A. Ilyina, V. A. Krichmar, and E. G. Safronov

Samara State Technical University, Samara, Russia
ol-masl08@yandex.ru, tanya.ilyina@list.ru,
vera.krich@yandex.ru, ewgenijsafronow@yandex.ru

Abstract. The introduction of lean manufacturing principles in Russian companies often causes dissatisfaction among employees. This is due to the fact that the staff is poorly involved in the process of changes that are imposed on them by the management. The authors suggest paying serious attention to motivation problems when applying principles of lean production by actively teaching employees the basics of the 5S system, which helps to reduce losses in the workplace, as well as involving employees in the process of continuous improvement. A solution to this problem, the authors see in the creation of training classes in companies that model production situations that require managerial influence using the lean production principles.

Keywords: 5S system · Labor productivity · Labor efficiency · Lean manufacturing · Losses · Process factory

1 Introduction

Recently, lean production (Lean system) has become one of the innovative management concepts implemented at Russian enterprises. This concept is based primarily on the production management system developed by the Japanese automobile giant Toyota in the 1950s. It is based on internationally recognized principles of the Toyota Corporation, which is known for its innovative approach to the production organization and strives to continuously improve all processes in the company.

Here it is important to emphasize that the true pioneer in improving the production efficiency is not a Japanese company, but the ideologist of the scientific labor organization Gastev, who in the 20s of the XX century after an active correspondence with Henry Ford implemented his method in the Soviet production, becoming the founder of the Central Institute of Labor (CIL), whose task was the development of productivity and production methods of workers [9].

The Lean system has been widely and successfully implemented in many foreign companies, at enterprises of various activity fields. Although the lean production methods have been most fully implemented at automotive and mechanical engineering enterprises, the successful implementation results are demonstrated by construction

companies [10, 15], horticulture [13], furniture industry [1], food industry [3], mining [14], etc.

This concept is based on enterprise management, which allows you to improve the quality of work by reducing losses. Losses are defined as anything that reduces the work efficiency and does not increase the value of a product or service to the consumer. In practice, such losses are extra movement of equipment and employees, which leads to an increase in production time; overproduction which leads to excess inventory and storage costs, etc. In general, losses lead to an increase in the cost of production.

For many Russian enterprises, the issues of high cost price, along with insufficient quality of products are quite acute. At the same time, problems of outdated equipment, high energy consumption, excessive inventory and inconsistent production processes remain also relevant [6]. However, despite the fact that the concept of lean production is generally recognized in the world and its main principles are aimed at solving these problems, its implementation at domestic enterprises is usually painful and it comes not always to the desired result [16].

2 Methodology

The authors used general scientific methods of systematic and integrated approaches, as well as traditional methods of economic analysis (observation, comparison) and non-traditional (heuristic techniques), analysis, synthesis, description, and comparison. Their application is determined by the theoretical nature of this research, which includes the following stages: problem statement, analysis of information on the research topic, comparison and description of various scientific views on the issues under study, synthesis of different approaches to the problem. The results of the study are based on the implementation of lean production and training of personnel according to lean production principles at industrial enterprises of the Samara region over the past three years.

3 Results

The main reason for these problems is the reluctance of employees to accept new ideas and work in accordance with them, as well as the inability of management to motivate staff in the new environment. This is already evident at the very first stages, when implementing one of the lean manufacturing tools of the 5S system (workspace management system). The 5S system implies the implementation of 5 steps (Fig. 1). The effectiveness of the 5S method is very important and has a correlation with the overall performance of production [18], but the resistance of the personnel begins at the stage of “removing unnecessary”. However, this state of affairs is typical for all spheres (production, services, education, health, etc.).

As a clear example, let’s consider a machine-building enterprise. On the assembly, maintenance, and other grounds of domestic enterprises, there is often a picture when a large number of unnecessary tools are located in the workplaces (locksmiths, turners, assemblers, etc.), which are practically not used or are used in emergency situations.

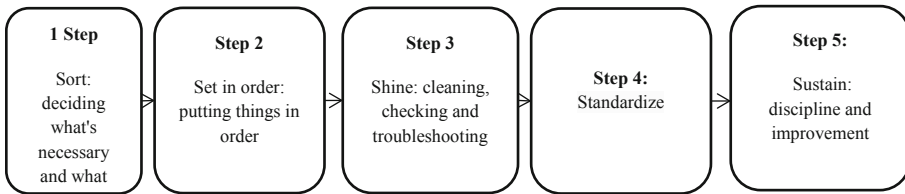


Fig. 1. Basic steps of the 5S concept (Source: authors).

The presence of an extra tool hinders the performance of current work and contributes to temporary losses in the search for a necessary tool.

At the enterprise level, an extra tool at each site leads to higher costs. At the same time, companies solve this problem by purchasing cheaper and, as a rule, low-quality tools. However, this tool wears out faster and a whole chain of unnecessary actions (ordering, delivery) is performed again to replace it, which increases the company's expenses. In addition, poor-quality and constantly changing tools (and sometimes their absence) affect the psychological condition of workers and, as a result, the quality and efficiency of production. So instead of time, effort, and money being spent on developing and improving the quality, it is spent on performing actions that do not add value to the product for the consumer.

The same applies to excess inventory. Many enterprises have a problem of overproduction, resulting in increased stocks of finished products in warehouses, or have the practice of purchasing excessive raw materials, without calculating the optimal volume of these materials for normal functioning of production. As a result, stocks and the size of warehouse space increase, that leads to an increase in the cost of their maintenance and the deadening of working capital, which could also be used for the production development. However, as a rule, enterprises solve the problem of working capital shortage not by using a lean production mechanism, but with additional credit resources, which further aggravates the negative financial situation. At the same time the most difficult part is trying to convince the staff, who are used to working according to the usual way, to change this state of things. Moreover, this applies to the entire hierarchical structure of the enterprise, from the simple worker to the general director.

It is quite difficult, for example, to persuade workers to organize their workplace with the 5S requirements: to remove all unnecessary things from the point of view of technological process, to place working tools rationally, to clean garbage and to wash the equipment to a condition when the smallest damage on it is visible, etc. For most of the staff who tried to implement lean production principles, the first reaction was to reject the proposed measures. People who have been used for years or even decades to work with a certain, familiar way for them, are wary of such innovations and do not see any sense in them. It should take enough time for the employee to feel the effect from the rational organization of the workplace. However, in general, no matter how much management tries to implement lean production system in the workplace of its employees, it will never be realized if the manager himself does not adhere to the "philosophy" of the lean production.

Most managers of domestic enterprises see the success of building a business in the growth of financial indicators and give them priority, which is fundamentally wrong. Only if business managers pay sufficient attention to the staff development, motivational and social activities, the impact of the lean production on the productivity growth will be sustainable. For successful implementation of lean production, first of all, the management itself should firstly be morally ready for changes (for example, it starts implementing the 5S principles in its workplace, and not only requires cleanliness from subordinates), constantly participate in the process of monitoring and improving the lean production processes. Otherwise, the removal and non-participation of management leads to demotivation of employees and no measures (especially of an administrative nature) can affect this. Secondly, the management of enterprises should pay special attention to measures for developing the corporate culture and social support for employees.

It should also be noted that, in general, methods of motivation in the lean production system are mainly non-material. It can be a moral incentive (by providing employees with flexible scheduling and special privileges), regular communication with subordinate managers, maintaining the corporate culture, etc. For unstable conditions of the Russian economy, such measures are essential. In addition, they are consistent with the domestic mentality, based on a propensity to cooperative work.

The success of implementing lean production principles depends more on how the company's management communicates this philosophy to its team. There are many ways for managers and subordinates to interact, which is the essence of management. Administrative and command methods, democratic and liberal – none of them will be successful if the lean philosophy is not accepted by every employee of the company.

At Toyota, the lean production philosophy is based on the principle of continuous training of employees in the framework of these principles in specialized training classes. This experience is considered as advanced and is now used all over the world, including Russia.

In our country, the creation of training classes to teach the principles of lean production at enterprises is a relatively new phenomenon. Its origins date back to the approval of the national project “Labor Productivity and Employment Support” in 2017, during which it is planned to ensure that by 2024 the growth rate of the labor productivity at medium and large enterprises of the basic non-resource sectors of the economy is not less than 5% per year [4, 17]. To implement this project, an operator was created – the “Federal Center of Competence” (FCC), its mission is to improve the quality of goods and services and increase the competitiveness of the Russian economy by creating a culture of high productivity and efficiency among employees of organizations in each region of Russia.

The state is interested in improving the efficiency of enterprises, so the FCC is entrusted with the main task of creating a methodology for training the staff of companies that have applied for participation in this project. Currently, 1513 enterprises from 62 subjects of the Russian Federation have become participants of this national project. It is important to emphasize that in addition to valuable knowledge and experience in implementing the principles of lean production, enterprises receive tangible financial benefits from participating in the national project: up to 300 million rubles for a period of up to 5 years at 1% per annum, under a number of conditions.

A mandatory condition for obtaining a loan under this program is to get a conclusion (certificate) of the FCC on the availability of key elements of the production system and a sufficient level of internal resources use to increase the productivity [7].

In the Samara region, one of the first participants in the national project is the company JSC “Sredne-Volzhsy mechanical plant”. More than two years have passed since the company entered the labor productivity program. During this time, impressive results were achieved: revenue increased by 44.6%, the number of employees increased by 10%, and the labor productivity – by 40.6%. This success would not have been possible without the company’s employees who deeply understand and support all the management’s initiatives.

One of these initiatives was to build the production system of the enterprise. The production system of this plant is a set of tools and methods used to convert all types of resources into finished products and based on improving the efficiency of processes and continuous improvement of the company’s activities. At the first stage, the basic guidelines for building a production system were formulated.

JSC “Sredne-Volzhsy mechanical plant” is very sensitive to the best practices in the field of improving the labor productivity, which are used by both foreign and domestic companies. Among the key elements of the production system, the company’s management has placed a bet on the following ones:

- search for 7 types of losses,
- applying lean production principles to eliminate losses, such as mapping, 5S, standardized work, and unit product flow,
- continuous improvement of all internal processes by mobilizing unused human potential, increasing the competence of employees and spreading the lean production culture. In order to achieve these goals, it was decided to create a training class “Process Factory” within the enterprise, which plays a serious role in training personnel for the implementation of plans outlined by the plant management to increase the labor productivity.

In the practice of global companies, such training centers solve three tasks at once. The first is to involve employees in the improvement process and motivate people by the preparation for changes. As a rule, the changes themselves have not yet begun at the enterprise, and the management needs to interest employees, teach them the basics of the lean production. Secondly, there is a need to provide employees with such a starting level of knowledge and skills that they could immediately use in their workplace without unnecessary theory, without large time expenditures, on the principle of “take and do”. Third, you need to bring them to a certain level of understanding of the lean production system so that they can share their knowledge with their colleagues and involve them in changes. After all, the main idea of lean production is that it is formed, first of all, as a culture, and only then as a skill for using appropriate tools in the workplace [12].

The training class “Process Factory” was created with the support of the “Federal Center of Competence” (FCC), which is the operator of the national project “Labor Productivity and Employment Support” [17]. Among the company’s employees, candidates were selected for the position of internal trainers who have received serious training in methods used by the FCC. As a result, they have a high level of competence

that helps them train other employees in the sphere of lean production culture. To date, the “Process Factory” of JSC “Sredne-Volzhsy mechanical plant” is a modern training class in which internal trainers train employees in key areas of lean production:

- search for losses by modeling production and office processes,
- process mapping,
- application of the 5S system in production and in the office,
- SMED-quick changeover,
- standardized work.

For each direction, methodological materials have been developed that have a close relation with the real processes taking place at the enterprise. Therefore, employees easily and with great interest are involved in training, learn to see losses, formulate and solve problems, and balance processes. This is a fully interactive learning format that doesn't have boring theory and long slides, but has a lot of practice. Internal trainers set a task for a group of participants: to optimize the production flow with specific, measurable performance indicators that should increase from shift to shift. And in the process of solving this problem, expert trainers teach how to do this using lean production tools. Due to the fact that participants work with real situations and see the effect of their actions in numbers, they come to understanding where they can and should put effort in their enterprise.

4 Discussion

Numerous studies show that innovative management concepts do not work at all or work poorly without building an appropriate organizational culture. So, researchers conducted a study among 295 British manufacturers [2]. Their findings show that the lean practice is positively associated with an organizational culture that is process-oriented, employee-oriented, structurally open, socially free, rule-based, and market-oriented. An even earlier study by a group of German scientists [11] shows that the lean philosophy can increase productivity and efficiency when it is applied in a complex way. According to them, the concept of Learning Factory is already actively used by some companies to train employees in lean production methods.

Some authors pay special attention to the need to revise the approach to the development of human resources that are important for the development of modern industrial systems [19]. They focus on improving, collaborating, communicating and transferring knowledge between industry and universities, facilitating curriculum development, and developing applied knowledge skills and methods. In their opinion, this ensures an effective and efficient transition from the academic to the industrial environment. At the very beginning of the professional career, a person should already have a certain set of knowledge about lean production in order to reduce the time for its adaptation in a company that applies these principles.

Some researchers of lean production consider quality and productivity as priority criteria for the business sustainability [8]. Others speak today about the concept of the Triple bottom line, according to which lean production should be multidimensional and pursue three goals: economic growth, environmental conservation, and social

responsibility [5]. But no one denies the importance of such a factor in the implementation of lean production as social responsibility.

5 Conclusion

Nowadays, the application of lean production is an urgent task for many Russian enterprises, since the issues of low labor productivity and product quality, high production cost are quite acute. However, the implementation of lean production in practice does not always bring the expected effect.

The authors use the example of a machine-building enterprise to investigate how losses are formed, what is their reason, and why the application of lean production (namely, one of its tools – the 5S system) does not bring the desired result. One of the main reasons, according to the authors, is the lack of motivation of employees to work in the new conditions (and this applies to the entire hierarchical structure of the enterprise). To solve this problem, it is proposed to use methods of non-material motivation of employees, which are organically consistent with the Russian mentality and are indispensable in unstable economic conditions.

In the article, a special place is given to the mechanism of state support for the introduction of lean production at Russian enterprises, which is implemented through the national project “Labor Productivity and Employment Support” [17]. The operator of this national project was the autonomous non-profit organization “Federal Center of Competence” (FCC), which was established in 2017. The mission of this center is to improve the quality of goods and services, increase the competitiveness of the Russian economy and the labor productivity at enterprises. One of the main tasks is to train the personnel of Russian enterprises in lean production methods.

In addition, the article investigates positive experience of one of the first participants in this national project, JSC “Sredne-Volzhsy mechanical plant”. The introduction of lean production has significantly affected the growth of labor productivity and increased revenue of this enterprise. The moral and psychological climate in the team has significantly improved. This company not only uses advanced foreign and domestic methods to improve production processes, but also successfully implements personnel training activities.

In general, we can say that the introduction of lean production at Russian enterprises, although it is associated with a number of difficulties, is still being implemented, as it is evidenced by the positive experience of domestic enterprises.

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