

Practical Aspects of Implementation of the "Lean Production" Concept in Light Industry

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Abstract- In the paper have been researched the practical aspects of the implementation of the concept of "lean production" in light industry on the basis of empirical analysis, and scientific conclusions are presented at the end of the article.

Keywords: lean production, cost, production costs, product, light industry.

1. INTRODUCTION

Within the framework of this dissertation research, systematization of the methodological apparatus of the modern state of lean production (TI), the concepts of lean production, theoretical and practical principles of lean production, comparative analysis of approaches and methods to the introduction of lean production, the current composition of lean production tools and the description of their essence contained. Scientific works and articles published in bibliographic databases of Scopus, ProQuest, e-Library information sources of foreign and Russian researchers were used to systematize the methodological apparatus of the modern state of economical production.

2. LITERATURE REVIEW

The concept of economy in production was first introduced by John Krafcik (John Krafcik) [1]. By "economy" (Lean), the author understood that in the new type of production there will be no excess at all. The term "Lean" is understood as "being able to work and work efficiently" (J. Wumek and D. Jones)[2]. In operational management books, lean production has the Uzbek version of "correct", "flat" or "lean" production.

Many authors (Dennis P. Hobbs [3], Stefan Ruffa, George Alukal [4], Lauri Koskela [5] and others) describe lean production as a philosophy of enterprise management based on the principles of lean production.

CIS researchers (Berezovsky E.E.[6], Adler Yu.P.[7] and Shper V.L., Lapidus E.A.[8]) called "Lean production" a means of survival for the enterprise and the production of the product they describe it as a factor of increasing competitiveness.

Many authors (Dennis P. Hobbs, Stefan Ruffa, George Alukal, Lauri Koskela, etc.) describe lean production as a philosophy of enterprise management based on the principles of lean production.

Researchers of our country (Berezovsky E.E., Adler Yu.P. and Shper V.L., Lapidus E.A.) describe IT as a means of survival for the enterprise and a factor of increasing the competitiveness of the manufactured product.

However, scientists and practitioners largely agree on one thing - lean manufacturing is aimed at dealing with losses at all stages of product production and service delivery. In order to ensure the efficient operation of the system, it is necessary to correctly select the cost-effective means of production. The value of the product and service is created by the company's employees at every stage, so it is necessary to carefully train industry experts who will be loyal and useful to the company.

Lean manufacturing theory and current state of research are critically analyzed the undisputed principles of lean manufacturing. The analysis of the composition of these principles showed the existence of three classical groups (improvement principles according to Ed. Deming, principles of lean production according to J. Wumek and D. Jones, and Toyota principles of doing business from J. Liker) (see Table 1.1).

Despite the fact that the authors express different opinions about which group of lean production principles should be used as a basis for the formation of a change program for the introduction of lean production and the organization of production in the enterprise, the main postulates, including value, means of achievement, corporate culture, constant improvement of the obtained results, are inevitable in all studies. participates. Thus, the principles of lean production serve as the foundation for creating a lean enterprise.

Researchers from abroad (Chase R., Galloway L., Sveim R.) and our country (Kononova V.Yu., Kazantseva S.M.) noted that the realization of the company's strategic goals directly depends on the management of the operating system.

The strategic goal of leading a company in the context of lean production is to achieve the efficiency of the enterprise at the expense of reducing costs. Additional goals and tasks in the process of achieving the main (main) goal - to be able to operate and efficiently, to achieve the normative profitability of the owner's capital, to provide uninterrupted service to consumers, to establish modern production that meets ISO standards, to create optimal delivery schemes aimed at saving transportation and warehouse costs is to create an enterprise capable of realizing

strategic goals of establishing cooperative relations with foreign enterprises.

In the context of operational (production) management, lean production is one of the approaches to management and development of an industrial enterprise.

There are currently four approaches to managing operating systems:

- Restocking system;
- Weak point recovery system;
- Pushing system;
- Towing system.

In order to determine the best approach to managing a modern enterprise, the existing approaches were comparatively analyzed. Based on various sources of information Scopus, ProQuest, e-Library database, it was concluded that there are several methods of introducing lean production in foreign and Russian practice.

Production system (derived from Toyota production system) approach is used more by foreign companies integrated in international activities. Within this approach, the main emphasis is placed on inter-organizational cooperation in production management. Proponents of the production system approach are Jeffrey Liker and Dennis Hobbs.

The Lean system (also known as Lean production in many sources) is primarily focused on saving costs by identifying and eliminating waste, thereby creating value for the consumer. Supporters of the lean system approach are James Wumek and Daniel Jones.

Disadvantages of US production methods and concepts include: general description, business characteristics, lack of consideration of existing conditions in the company (conditions for applying lean production), suitability for more production companies.

Business system approach is used more by large enterprises and corporate structures of business. In accordance with this concept, it is envisaged to apply production systems management methods and tools to all processes and structural structures in the enterprise. The business system approach is used in combination with several other concepts, models and approaches, for example, the Lean system. It should be noted that the Lean system and TOC, Lean system and 6 Sigma, Lean system, TOC and Kaizen, Lean system, TOC and 6 Sigma combinations are used in the management and organization of production systems. In this way, the company's management tries to take into account the advantages of each approach. However, one approach is thoroughly mastered before moving to the format of using a combination of several approaches.

The Kaizen approach is the basic concept of all production systems. This approach is aimed at continuous improvement of work and includes quality circles, TPM system, Kanban and other systems.

Recently, the Japanese approach to the introduction of lean production - the "20 keys" method proposed by Ivaio Kobayashi - is actively developing in Russia. The Japanese option of setting up and managing the production system is a very modern, sophisticated and universal approach, which is too expensive for most Russian companies.

There is a new model that is little studied by Russian researchers and practitioners, and this is the 3S model. With the help of this model, the authors Bilaerts, Plis, Voeten and Santema propose to manage the innovative processes in the value creation system based on three perspectives - continuation, configuration and conception, and to evaluate the integration of lean production in the enterprise according to the criteria of "thriftiness". .

A study of the theory and modern foundations of lean production showed that the development of lean production was supported by Taiichi Ono [Ono, 2008], Masaaki Imai [Imai, 2010], David Mayer (David Mayer) and Jeffrey Liker (Jeffrey Liker) [Liker, 2010], Edwards Deming (Edwards Deming) [Deming, 2009; 14 points of Deming's program for management] (see table 1.2) and foreign authors and scientists, inventors and industrialists made great contributions.

Based on the summation of the results of foreign and domestic research on the introduction and development of lean production and the research of various scientists aimed at the development of lean production, the sequence of the development of lean production tools from the discovery of the first tool to the current state of the tools is described.

3. ANALYSIS AND RESULTS

Classical groups of principles of lean production form its foundation, and these principles are implemented thanks to a certain set of tools of lean production. The sequence of the development of lean production tools was clarified and the results of the research conducted in our country made it possible to describe the composition of the tools of the modern lean production system.

Today, lean production consists of 14 tools: 5S - workplace organization; Haijunka - production and work schedule alignment; Hansey - constant self-analysis; JIT – "just in time"/Just-in-Time system; Kaizen – continuous improvement; Kanban - reduction of inter-operational stocks; MRP - Material Requirements Planning;

SMED – quick reset/Single-Minute Exchange of Dies; Standard work - work standardization; Team work - work as a team; TPM - Total Productive Maintenance; TQM - quality management system/Total Quality Management; Visual control - visual control; VSM - Value Stream Mapping.

The tool differentiation method developed by Taichi Ono is recognized as a traditional method and was developed so that employees and suppliers understand the ideology of the Toyota Production System. The system of lean manufacturing tools consists of 5 blocks: principles, foundations, conceptual frameworks, ideological orientation and tactical tools.

The American way of distinguishing between the means and principles of lean production was proposed by James Wumek and Daniel Jones.

A modern system of lean production tools is proposed based on the classical options for distinguishing lean production tools and principles and taking into account the modern composition of lean production tools (see Figure 1.9).

The composition of the modern system of cost-effective means of production has three aspects: fulfillment of delivery conditions, striving to ensure quality, and reduction of production costs.

The modern system of lean production tools is based on the principles of their use, these are: stability (heijunka), standardization (standardization work) [Layker, 2011, p. 156] and team work (teams) [Layker, 2010, p. 424].

The use of lean production tools (taking into account IT principles) depends primarily on what changes are required in the company's activities and how deeply lean production is implemented in the company. As a result of researching the theory and practice of using lean production, it became clear that the apparatus of lean production is understood at many levels (philosophical, methodological and instrumental).

Lean production at the level of tools is a set of tools for developing production at various stages of business processes, in general, of the organization's activities or its various functional areas. For example, at the level of tools, "kaizen" allows to improve individual operations, methods and processes. In contrast to the tools level, the methodical level of understanding lean manufacturing enables the systematic use of lean manufacturing tools. At the methodological level, "kaizen" is the improvement of the system of basic, management and supply processes that support decision-making methodologically, informationally and organizationally. At the philosophical level, "kaizen" is a culture of continuous improvement characteristic of the entire team of the enterprise.

When the management of the company realizes the importance of kaizen tools in the process, from solving local problems to changing the methods of using tools and the philosophy of business management, the operation of the enterprise will also change.

The use of lean production tools also depends on the organizational components of the company's activities (tasks, quality of employees, organizational structure, technologies used) (see Figure 1.10). The listed components are inextricably linked to the level of understanding of lean manufacturing. Tasks are local at the tool level. The quality of employees is primarily determined by their professional qualifications. Changes in the structure are reflected in the assignment of new tasks to employees within the framework of daily work. The organizational component "Technology" refers to the acquisition of new means of cost-effective production.

At the methodological level of understanding lean production, changes in technology require changes in production methods. The quality of employees is evaluated by the extent to which the work team is involved in the process of change. Changes in organizational structure and cross-functional coordination may be necessary. Tasks defined at this level may relate to a comprehensive approach to implementing change.

At the philosophical level of understanding lean production, tasks are of strategic importance, special attention is paid to the company's new value system focused on lean production, the organization's management structure is restructured, and the entire system of the company's business processes is developed.

At the core of the proposed lean manufacturing lean manufacturing implementation and development methodology is a multifaceted conceptual model of the modern content of lean manufacturing. It includes the classical principles of lean manufacturing described above, the modern composition of lean manufacturing tools, the possible levels of understanding of lean manufacturing in the organization, the organizational components of lean manufacturing and the extent of changes required in the enterprise.

In order to use the theoretical-methodical apparatus in the company's activities, it is necessary to determine what conditions encourage managers of enterprises to understand lean production with different organizational components and apply lean production tools at different levels of change. In order to ensure the applicability of the methodological approach being developed, it was necessary to research the practice of lean manufacturing.

Recognition of human resources as a source of increasing productivity of the organization implies effective use of employees, creation of conditions for them to show and develop their potential. "Efficient technologies" is a management tool that is relevant and in great demand today. Their essence is that losses are eliminated consistently and thoroughly, and at the same time, production efficiency is increased by maintaining respect for the human being. Lean technologies are universal and can be adapted to any enterprise and organization. Let's

consider the essence of the concept of "lean production".

The concept of "economical production" was formed at the junction of various disciplines, such as: scientific organization of work; quality management; psychology; production technology; strategic management; financial management; innovative management; production management; organization of production; human resource management.

Using the concepts of "lean production", scientific organization of labor (MIT), the theories of product quality and human resource management presented in these scientific works, the author defined a number of functions of labor activity that determine the productivity of employees (Fig. 1.3).

Quality management is a coordinated activity that ensures compliance of manufactured products (services) with standards.

The introduction of "lean production" implies the involvement of human resources in the process of optimization. In this case, the "unrealized creative potential" of employees is a type of loss. Employees are the main resource that ensures the increase of production efficiency in the enterprise (organization). Such a personnel management system becomes especially relevant when the organizational structure changes; labor is optimized; employees are regularly developed and their interests are taken into account when management decisions are made.

Let's consider the essence of the concept of "lean production". According to the definition given by the author of the concept, Tahiti Ono, "lean production" is a system in which the activities that take time, but do not create value, are eliminated, and then such conditions are created that the remaining activities that create value are sorted into a continuous flow that the consumer "pulls".

D. According to Liker, "lean production" is a method whose task is to involve all employees in optimizing processes. The purpose of recruitment is to achieve continuous improvement and increase efficiency by effectively developing human potential and realizing it as much as possible on the basis of mutual respect between owners, management and employees.

D. Vumek and D. Jones said that "lean manufacturing" is a management concept that was created at the Toyota Motor Corporation and is based on the desire to eliminate all types of losses without deviation. Within the framework of the concept, it is intended to involve every employee in the process of business optimization and direct all processes to the consumer as much as possible.

E.A. According to Bashkardin, "lean production" is the organization of the workplace, production areas, service and repair, logistics, accounting, other administrative and is a comprehensive production system that covers support services, i.e. planning of the company as a whole.

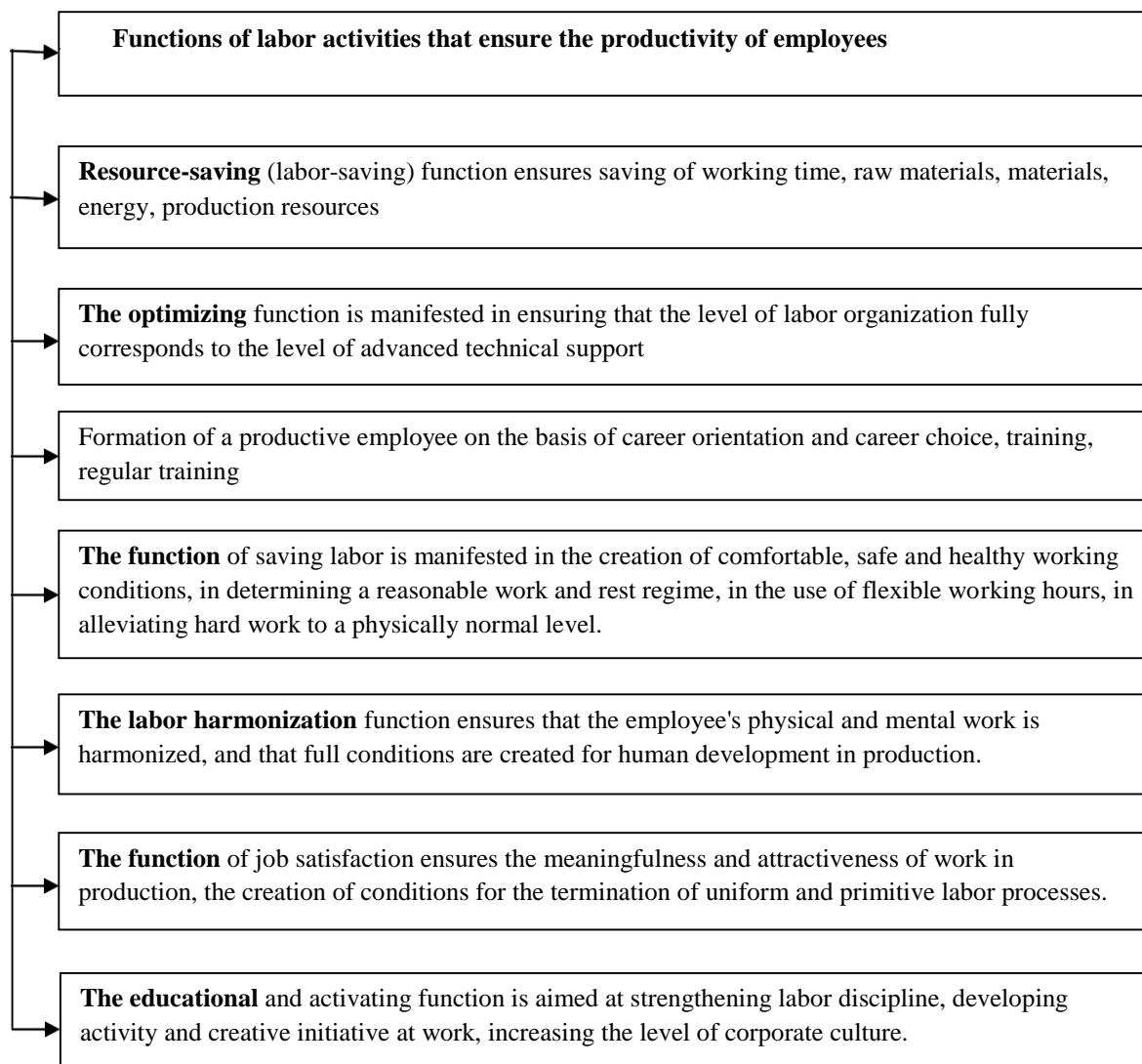


Figure 1.Labor activity functions

N.S. Davidova notes that "lean production" is based on regular reduction of non-production costs and continuous improvement of the production process.

Thus, "lean production" is a management philosophy based on systematic identification of unproductive losses and improvement of the production process. The introduction of "lean production" requires new approaches to human resource management based on the recognition of employees as the main source of increasing the efficiency of the enterprise.

Based on the above, we present the main principles of "lean production":

- 1) Understanding value - it is necessary to understand what is valuable to the consumer.
- 2) Determining the value creation flow – it is necessary to study the value creation process and identify non-production losses.
- 3) Dealing with losses - reducing or eliminating the main types of losses (waiting, overproduction, transportation of materials, overprocessing, stocks, trips from one place to another, defects).
- 4) Product flow - ensuring that the product moves in a continuous flow through special production cells from raw materials to finished products.
- 5) Production "withdrawal" - no work is done unless it is used in further operations, there should not be a large stock in the warehouse.
- 6) Continuous improvement - the process of continuous reduction of losses, reduction of time for work operations, cost of products, etc.

Speaking about the principles of lean production, Jones and Wumek emphasize that the product or service is

valuable. They say: "... In almost every place where traditional organization and technology, an outdated idea of economies of scale prevails, the concept of value is misinterpreted. Managers around the world say, "We can do this job on the equipment we have." If consumers don't like it, we will lower the price or conduct a sensational advertising campaign." In fact, it is necessary to look at the concept of value through the eyes of the consumer and fundamentally revise it.

In lean production, the goal is not only to make a profit, but to create a product or service that is highly satisfying to the consumer, is useful for him, feels a need for him, and is valuable for him. For this, marketers constantly study the market, conduct surveys, study the experience of using a similar product, and study in detail similar products or services of competitors. Such studies allow to determine both the required product and its characteristics, description and functions. Determining the cost of the product is precisely this - this is the first principle of lean production.

Another important principle of lean manufacturing is to create a value stream. It is with its help that simple production turns into cost-effective production. Here the main meaning is summed up in the word "flow". A value creation stream is a set of all operations performed to produce a given product. "Flow" means their continuity and unity.

Japanese engineers changed the philosophy of flow. In organizing all processes and establishing a flow, the main focus is on the continuous movement of bodies and products. They should always be at work, not lying in an unknown amount near the warehouse or workplace. This philosophy became the prelude to lean manufacturing. According to Wumek and Jones: "All men should give up the tendency to compartmentalize and piecemeal work, because there is a more efficient method in which the product is continuously processed as it travels from raw material to finished product. In order to increase efficiency, it is necessary to focus not on the enterprise and equipment, but on the product and its needs.

Lean production is able to change the situation not only by making a small adjustment, but also to fundamentally change the order in the company. It's not that you and your staff are doing poorly. Simply, the implementation of lean production in the enterprise allows to reduce the time spent on the production of products, reduces waste and increases productivity.

A key principle of lean manufacturing thinking is value creation. Value is the behavior that a consumer is willing to pay for. A value-creating action must meet the following three criteria: First, the action is needed by the consumer. Second, this action changes the form/function of the Product/Service, thereby bringing it closer to its final state. The third is that the action must be performed from the first time and without defects.

The next principle of lean production is to eliminate losses.

Any action that does not create value is a waste. 8 types of losses are distinguished:

- Overproduction
- Excess stocks
- Defects
- Actions that do not create value
- Waiting
- Excessive movement
- Transportation in transport
- Untapped potential of employees.

If the habit process is observed, it can be seen that all the behaviors that are not focused on value creation occupy 50-90% of the production cycle.

Process flow / The principle of continuity of product and information flow is that work is in continuous motion from START TO FINISH. The goal of any process is to ensure that the product or information is in a continuous flow from beginning to end. Challenges that hinder stream creation:

Inefficiency of flow. All efforts should be aimed at controlling the flow, and if deviations are detected, action should be taken.

The flow is out of bounds. In this case, the process goes beyond its limits. It is important for professionals working with the flow to understand its limits. If the process goes beyond its limits, it will also lead to losses.

The principle of "pulling" is characterized by having a clear idea of how much product is needed, which allows you to know in advance the amount of raw materials needed and how often it needs to be replenished. The "pull" system is also characterized by small lot sizes and low levels of work-in-progress and stocks. The "pull" system forms a management style characterized by the presence of reporting and signaling systems, as well as an advanced communication system.

The main goal of any process is perfect efficiency. And for lean production, creating an invisible and perfect production flow without losses is the solution to this task.

What are the main tools of lean production?

5S method (Selection, Organization, Order, Standardization, Discipline, (+) Safety).

Elimination of losses.

Determining the required tact and pace time for the process.

Creating and using a Kanban system (signal system). The goal is to reduce work in progress and losses.

Using the Poka Yoke method ("Protection from Errors" system). Identify errors early on.

Create a seamless flow of raw material/information.

Reducing the time it takes to change shifts to minutes (instead of hours).

The Andon method, or using a visual signal system to let the machine know that it needs attention.

When talking about the principles of economical production, it would be wrong not to talk about a principle that is simple at first glance, but difficult to implement. Without this principle, all plans remain on paper. It requires two conditions to be met in order to implement lean manufacturing. The first is the determination to establish and adhere to lean manufacturing. This intention must arise in the management of the enterprise and become a tool that guides the entire team. Lean manufacturing is not a one-time event, but a way of working and a course of action for all employees. Lean manufacturing is not implemented from outside, for example, by orders from above or with the help of invited consultants. It's not that counselors can't help, they certainly can. The fact is that the leader and management should not monitor or control this process, but should manage and lead.

The second and very simple condition is to master, apply and creatively develop the principles and tools of lean production. It requires constant study of theory, learning of experience of other enterprises, training of employees.

From the experience of implementing lean technologies, it is clear that no matter how much employees improve processes, no matter how "lean" they make it, new ways to eliminate losses will appear. Improvements and value creation are driven by the efforts of employees. Employees are the main asset of the enterprise and the owners of the cultural value of lean production.

Only if all employees of the enterprise, from the business owner (top management) to the ordinary worker, follow the principles of lean production, the enterprise becomes "lean" production. Both existing and new employees must be trained to ensure that lean manufacturing principles are consistently followed. In addition, not only the operating kernel, but also operating system objects, including suppliers, business partners, are involved in the learning process. The concept of hansey (hansey) is used to make the logic of lean production tools complete. Hansei is part of the company's culture and is an integral part of a company that constantly improves knowledge. Constant changes, innovation and flexibility have become an integral part of successful business and an inevitable condition for operating without facing a crisis in the 21st century. A new approach requires the development of reading skills. Lean enterprises use conscious balancing and standardization to realize the innovative idea put forward by the project team. These innovative ideas are standardized and used until a new approach is found. Standardization combined with innovation anchored in new standards forms the basis of a new approach to training and creating an ever-learning enterprise.

In a continuously improving and learning enterprise, learning also extends to suppliers. Lean manufacturing expands its boundaries, and the complex process of integrating independent suppliers into a single network begins. Such a structure is called a "training cost-effective enterprise". Collaborative learning is carried out through practical workshops on production improvement, the supplier is responsible for the results of the learning. Different approaches to organizing the work of suppliers are tested in these workshops.

The successful operation of the "learning lean enterprise" requires skilled top management of the manufacturing company, cooperation with suppliers, a culture of continuous improvement and mutual learning.

Studying the textile industry, which plays an important role in the economy of the Republic of Uzbekistan, and determining its future prospects are important issues not only for the country's economy, but also for increasing the well-being of the population and ensuring employment of the population. Because the development of the textile industry is primarily based on the adequacy of our own raw materials and workforce.

In this regard, the decree "On the strategy of actions for the further development of the Republic of Uzbekistan" states:

- ensuring the balance and stability of the national economy, increasing the share of industry, service sector, small business and private entrepreneurship in its structure;

- setting priority tasks such as further modernization and diversification by moving the industry to a qualitatively new stage aimed at the rapid development of high-tech processing industries, first of all, on the basis of deep processing of local raw materials, on the production of finished products with high added value, determines the relevance of the raised topic .

Among the mentioned tasks, the development of this field is manifested in the consistent implementation of correctly made decisions and plans. For this, it is necessary to develop a scientific conclusion and proposals based on the results of an in-depth study of the industry, economic and econometric analysis. In this sense, we will perform an econometric analysis using the statistical data of network activity for the years 2000-2020. This, in turn, is the basis for making a clear and scientific conclusion about the activity of the industry.

Among the mentioned tasks, the development of the light industry network is manifested in the consistent

implementation of the right decisions and plans. For this, it is necessary to develop a scientific conclusion and proposals based on the results of an in-depth study of network activity, economic and econometric analysis. In this sense, we will perform an econometric analysis of network activity using statistical data from 2008-2019. This, in turn, is the basis for making a clear and scientific conclusion about the activity of the industry.

In this regard, in our opinion, it is appropriate to use the STATA16 program, which is used in international statistics, in order to save time and ensure the reliability of models when performing econometric analysis. Based on the data from Chapter 2, we will create a regression equation for him:

$$Y = -3246,43 + 0,578 \cdot X_5 + 28,197 \cdot X_{13} + 60,284 \cdot X_{15}$$

By criteria and considering that $df=10$ is equal to 1, t_{x_3} , t_{x_4} and t_{x_5} it is reasonable to check the equation according to the criteria determining the quality of the forecast model (Mean absolute percentage error-MAPE) and (Theil inequality coefficient-TIC) $0 \leq TIC \leq 1$ (Figure 2).

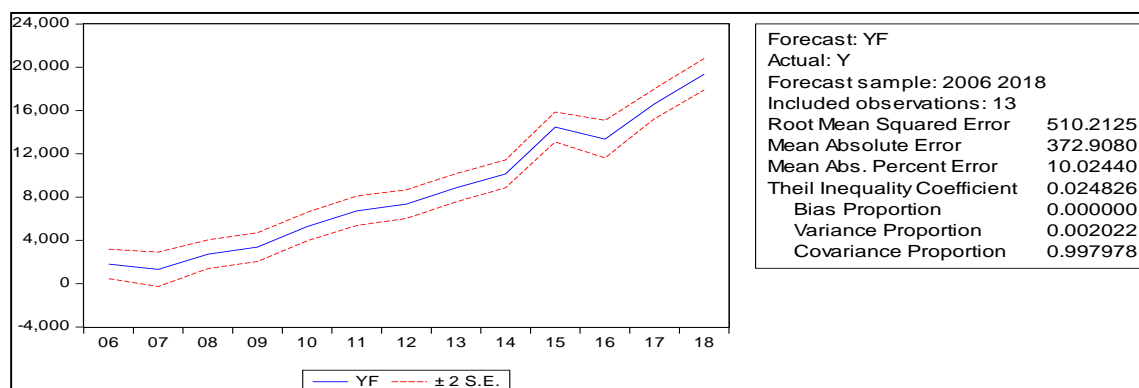


Figure 2. MAPE

According to the above test results, according to the t-Statistic, it is seen that X2 is insignificant, in this sense, to check the significance of this parameter, MAPE and TIC criteria are checked as alternative measures of forecast accuracy (Figure 3.1). Based on the information presented in the figure, $10 < MAPE < 20\%$ Since the prediction accuracy is good and X2 is significant from the $TIC > 1$ level, equation (1) is reliable and adequate.

It should be noted that labor productivity depends on the number of workers on the one hand, and on the rational organization of production on the other hand. If a light industrial enterprise makes full use of equipment and production areas, advanced technologies, and works on the basis of the lean production concept, labor productivity will increase.

Prospective medium and long-term development of light industrial production in Uzbekistan is determined by the volume of investments aimed at updating the material and technical base of enterprises and the level of competitiveness of products in domestic and foreign markets. The investment activity of enterprises is the main factor in the formation of demand for textile products. The logical result of technological innovations in the field of light industry should be to increase the competitiveness of the industry in the domestic and foreign markets.

It is recommended to consider the main possible scenarios for the development of the sector within the framework of a comprehensive state program for import substitution. Alternative scenarios are based on the forecast for the development of the market of light industrial products until 2024 and depend on the level, forms and methods of state support for the industry.

The results of the analysis of the strategic development prospects of Uzbekistan's light industrial industry show that there are two options for solving the system problem.

1. The inertial scenario ensures the preservation of the current development dynamics without any major changes in the development of the country's light industrial complex. This leads to a further increase in the share of imports in the domestic market, and subsequently to a decrease in the export of this sector.

The inertial scenario does not imply any significant action by the state. The role of the state can be minimized and can be in the continuation of the policy of encouraging certain directions of research and design activities, maintaining the acceptable level of tariffs for importing equipment from abroad, increasing the level of localization of machine tool production, subsidizing and other forms of support.

In the case of an inertial scenario, the existing negative trends in the development of the industry will continue and may lead to undesirable consequences in the future:

- the production capacity of enterprises decreases and labor productivity does not increase;
- The share of imported equipment in the market of Uzbekistan may increase to 90% in 5-7 years, and domestic products may be completely replaced for some light industrial technologies;
- reduction of the number of people employed in light industry due to a sharp decrease in production.

The current trend in technology provision of light industry has a serious impact on technological security, and spending on related sectors (fuel and energy sector, metallurgy, mining industry, etc.) will increase sharply due to increased dependence on imports.

2. The innovation scenario involves modernization of the material and technical base of enterprises in the field of scientific research of local manufacturers, resource-efficient production lines are involved, and the organization of work based on the concept of "Lean production".

The main goal of forecasting the volume of production of light industry is to calculate the net income from product sales, profit tax, the economic efficiency achieved by the annual average use of production capacities in the light industry. Based on the changes of the products produced in the light industry sector in the Republic of Uzbekistan in 2000-2020 and the volume of these produced products, prospective changes can be predicted in several decades.

It is reasonable to accept the highest achieved level during the years under review in the forecasting of the production volume. From this point of view, the following results were obtained based on the regression functions for forecasting the production level in the inertial scenario and the minimum critical point of development.

The significance of the forecast indicators according to the obtained model (1) is $p \leq 0.05$ at $R^2 = 0.974$, which means that the forecast values obtained according to the model are reasonable.

Based on the obtained regression models, the production volume of the inertial scenario of light industrial products in 2024 is 35874.1 billion amounting to 39,975.6 billion soums, the production volume of the innovative scenario light industrial products in 2024 it was determined to be soum (Table 1).

Table 1: 2020-2024 forecast indicators of production volumes of light industry enterprises in inertial and intensive directions

Years	Innovative scenario	Innovative scenario
2024	35874,1	39975,6
2025	37084,9	41204,7
2026	38421,6	42777,9
2027	39758,4	44351,1

The development of the light industry network in the republic is planned on the basis of the modernization scenario planned for 2024-2027, and it will be implemented through the following advantages:

Development of public-private partnerships in the field of scientific research by financing part of the expenses for research and development in the real sector of the economy;

- providing state guarantees for loans attracted by engineering companies for the purpose of obtaining a license or developing research and development works;
- provision of "long" credit sources while covering part of the interest rate at the same time;

As a result of the implementation of the modernization scenario, the following positive results will be achieved:

- increase in the number of design-oriented innovative enterprises in the engineering complex;
- to reduce the duration of creation and development of new products due to strengthening the coordination of ongoing research and development;
- increase in co-financing from extra-budgetary sources;
- implementation of modern management concepts in light industrial enterprises, ensuring the rationality of choosing the priority areas of research and development.

Thus, the conducted research came to the following conclusions:

1. Improvement of the model of effective use of production capacity, improvement of labor productivity, improvement of corporate spirit and corporate culture in the team, organization of coaching, using lean production tools (SMED, 5S systems) in light industrial enterprises are part of the daily task should be rotated.
2. In light industrial enterprises, it is necessary to regularly receive and implement suggestions from employees on saving time, setting machines to work at the same time, and reducing the duration of operations, as well as rational organization of production. In this chapter, the 2020-2024 forecast indicators of the production volumes of light industry enterprises in our country in inertial and intensive directions are calculated, and the necessity of development according to the innovative scenario in order to increase the efficiency of the use of production potential is scientifically based.

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