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A MODEL FOR SATISFACTION IMPROVEMENT IN PARTICIPANTS OF THE EDUCATIONAL PROCESS VIA THE INTRODUCTION OF LEAN TOOLS IN THE ADMINISTRATION OF UNIVERSITIES

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Abstract. This paper considers a model to boost satisfaction in all educational stakeholders at higher education institutions via the introduction of lean manufacturing techniques into administrative departments. The authors emphasize the importance of using lean methodology due to increasing competition in the education market and the need for resource optimization. The authors propose a model that illustrates the relationship between resources, processes, lean manufacturing tools, and the level of satisfaction among students, faculty, and staff. The research method involves analyzing current processes, identifying areas for improvement, and implementing techniques such as 5S, value stream mapping, Kanban, and standardization. According to the results, the implementation of lean techniques can reduce time and cost, decrease bureaucratic burden, and enhance service quality. In turn, it would have a positive impact on the satisfaction of all participants in the educational process. The practical significance of this research lies in the potential to apply the proposed model in order to enhance the university performance and ensure sustainable development or higher education.

Keywords: lean manufacturing, higher education institution, dean's office, participant satisfaction, process optimization, standardization, operational efficiency, management model

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МОДЕЛЬ ПОВЫШЕНИЯ УДОВЛЕТВОРЕННОСТИ УЧАСТНИКОВ ОБРАЗОВАТЕЛЬНОГО ПРОЦЕССА ЧЕРЕЗ ВНЕДРЕНИЕ ИНСТРУМЕНТОВ БЕРЕЖЛИВОГО ПРОИЗВОДСТВА В АДМИНИСТРАТИВНЫХ ПОДРАЗДЕЛЕНИЯХ ВУЗОВ

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Аннотация. Статья посвящена разработке модели повышения удовлетворенности участников образовательного процесса в высших учебных заведениях через внедрение инструментов бережливого производства в административных подразделениях. Авторы рассматривают актуальность применения Lean-методологии в условиях растущей конкуренции на рынке образовательных услуг и необходимости оптимизации ресурсов. В работе предложена модель, которая демонстрирует взаимосвязь между ресурсами, процессами, инструментами бережливого производства и уровнем удовлетворенности студентов, преподавателей и сотрудников. Методология исследования включает анализ существующих процессов, выявление потерь и их устранение с помощью таких инструментов, как 5S, картирование потока создания ценности, канбан и стандартизация. Результаты показывают, что внедрение инструментов бережливого производства способствует сокращению временных и ресурсных затрат, снижению бюрократической нагрузки и повышению качества услуг, что, в свою очередь, положительно влияет на удовлетворенность всех участников образовательного процесса. Практическая значимость исследования заключается в возможности применения предложенной модели для повышения эффективности деятельности вузов и их устойчивого развития.

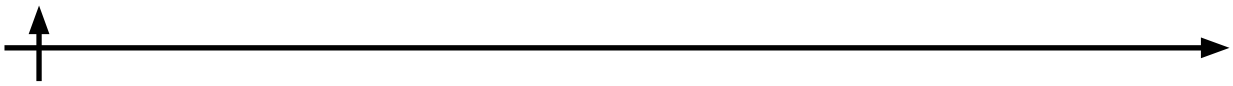
Ключевые слова: бережливое производство, высшее учебное заведение, деканат, удовлетворенность участников, оптимизация процессов, стандартизация, операционная эффективность, модель управления

Для цитирования: Лямин Б.М., Янчевская М.Ю. Модель повышения удовлетворенности участников образовательного процесса через внедрение инструментов бережливого производства в административных подразделениях вузов // Техноэкономика. 2025. Т. 4, № 2 (13). С. 32–41. DOI: https://doi.org/10.57809/2025.4.2.13.3

Introduction

Higher education institutions play a crucial role in socio-economic development by acting as a catalyst and contributing to the formation of intellectual capital. They are essential for transferring knowledge and skills to future professionals, as well as for generating new knowledge, innovation, and technology. The quality of higher education has a direct impact on a country's competitiveness and its ability to face modern challenges, ensuring its long-term sustainable development.

In the context of improving the efficiency of higher education institutions, the concept of lean manufacturing has become increasingly relevant. This approach, which is based on the principles of flexibility, resource optimization, customer focus, and loss minimization, offers powerful tools for enhancing educational processes and improving service quality (Loginova, 2021).



With increasing competition in the education market, implementing lean manufacturing principles has become not only desirable but essential for the successful operation of universities (Myslyakova, 2020; Romanov, 2021). Optimizing processes, rationally utilizing resources, and enhancing the quality of educational programs enable universities to strengthen their market position, attract talented students and faculty, and contribute significantly to economic and societal development (Pulin, 2020; Lyamin, 2023; Bykova, 2020).

The adaptation of Lean-principles in higher education involves transforming them to fit the specific needs of educational activities. Customer orientation in this context means focusing on the needs of students and other stakeholders. Resource optimization implies using financial, material, time, and intellectual assets rationally. The introduction of lean technologies into educational processes improves the quality of services, reduces costs, and enhances interaction with the outside world. This, in turn, helps increase the competitiveness and long-term sustainability of higher education institutions (Sharafullina, Chelombitko, Golubenko, 2020; Turieva, Brenman, 2024).

The relevance of integrating lean manufacturing into the strategic and operational activities of higher education institutions is determined by several interrelated factors. In today's rapidly evolving educational environment, where competition in the education market is growing, universities are faced with the challenge of increasing resource efficiency, optimizing business processes, and ensuring high-quality education. Lean manufacturing, which focuses on minimizing all kinds of losses and continuous improvement, provides a set of tools to help achieve these goals (Avdeeva, 2019; Akmayeva, 2019).

The significance of implementing this approach stems from the need to adapt to changing student and labour market demands, enhance the transparency and accountability of the university, and pursue sustainable development in the long run. Therefore, introducing lean manufacturing principles represents a strategically significant step towards enhancing the competitiveness and efficiency of modern universities.

One of the key principles of lean manufacturing is a focus on the customer. In the case of educational institutions, this means focusing on the needs and expectations of various stakeholders, including students, teachers, administrators, and potential employers. Implementing this approach requires an in-depth understanding of the current needs of each stakeholder group, as well as systematic efforts to optimize and improve internal processes.

This includes the use of lean manufacturing techniques such as MUDA and process standardization, as well as continuous improvement (Kaizen). These tools help to improve the quality of education and meet the expectations of every party involved in the academic process.

Materials and Methods

The study used an integrated approach to increase the satisfaction of participants in the educational process by introducing lean manufacturing tools to the administrative departments of the university.

At the first stage, the authors analyzed the current processes of the dean's office to identify losses that did not add value for students, faculty, and staff. Monitoring, document analysis, and interviews with key stakeholders were used for this purpose.

What is more, the authors assessed efficiency based on a comparison of indicators before and after introduction of lean tools, such as query processing time, error rate, participant satisfaction, and departmental efficiency. Descriptive statistics and comparative analysis were invited to process statistical data. This approach ensures the repeatability of the research and the ability to adapt the proposed model to other universities, considering their unique organizational characteristics.

Results and Discussion

To optimize the operation of university departments, the integration of lean manufacturing tools is essential. As part of implementing lean manufacturing tools in university departments, it is crucial to identify and eliminate potential losses that may arise at various stages of the process. These losses primarily include the following:

– Preparation of unnecessary or overly voluminous reports, providing information that exceeds the requested amount, or duplicating data in different documents—all these are examples of overproduction;

– Lengthy approval and decision-making processes, slow IT system operations, and delays in delivery and/or response to calls;

– Errors in the preparation of documents, such as spelling, punctuation, and content, as well as mistakes in entering data;

– Various comments during re-approvals and information requests for clarifications and reformulations;

– Missing records or lost documents.

Another set of common issues is presented below:

– Irrational planning of work areas and inconvenient file locations;

– Departure of an employee for a meeting that could have been organized remotely;

– Sequential coordination instead of parallel coordination;

– Transferring documents or information manually to the next stage;

– Restoring and saving files;

– Transporting files or folders with documents;

– Storage of prepared information and analytical materials that are no longer relevant, accumulation of unresolved tasks and issues, as well as excess office supplies—unnecessary reserves;

– Excessive information in documents (emails), unnecessary information on presentation slides, and unnecessary approvals—excessive processing.

Eliminating the identified losses at all stages of the cycle is a key factor in improving its operational efficiency. Meanwhile, the analysis and assessment of activities should be conducted systematically in order to continually improve and create a sustainable organization.

Researchers and scientists are focusing on the potential of lean tools to optimize various university processes, including educational, research, and administrative activities.

Vladyka M.V., Gorbunova E.I., and Polevoy I.N., in their work, emphasize the need for a modern integrated lean manufacturing concept adapted to the specific needs of educational institutions. They also note the significance of adopting a synergistic approach to managing lean production technologies through the use of complementary and reinforcing tools and techniques that form an integrated lean educational system (Vladyka, 2019).

On the other hand, Khuziev G.M. and Sagitova N.S. emphasize the importance of employing a process-based approach when implementing lean production tools. They argue that in order to achieve effectiveness, it is essential to develop an adaptable model that prioritizes meeting the needs and expectations of all stakeholders (Khuziev, 2019).

In her research, Surovitskaya G.V. emphasizes the importance of lean manufacturing tools in the context of increased uncertainty and a rapidly changing external environment. These tools are crucial for ensuring the sustainable development of organizations. The author states that the maximum efficiency is achieved through the integrated use of these tools, considering their interrelationships and synergies (Surovitskaya, 2023).

The research data indicate a significant positive correlation between the use of lean technologies in universities and the satisfaction of participants in educational and administrative processes. The implementation of the 5S approach ensures the ergonomic working conditions for

the faculty and a convenient learning environment for students, stimulating their engagement and internal motivation.

In addition, mapping the value stream helps minimize the time spent on administrative tasks, reducing psycho-emotional stress and increasing employee satisfaction. This, in turn, contributes to a more efficient educational process.

Thus, it can be concluded that the use of lean tools in higher education is an effective way to optimize the management of educational, scientific, and administrative processes. Researchers emphasize the need to tailor lean approaches to the specific needs of universities, such as developing integrated models based on a process-oriented approach and combining various methods.

As mentioned above, the growing demand for management efficiency and the rational use of resources dictates the need for an increasing interest in the lean manufacturing methodology (Chelombitko, 2020; Hadasevich, 2022; Shustrov, 2023). The directorate (dean's office), as the key administrative unit responsible for coordinating educational, scientific, and economic processes at the institute (faculty) level, represents an important platform for the implementation of lean techniques (Silkina, 2023; Yanchevskaya, 2024; Lyamin, 2024). Therefore, the study of the practical application of these techniques in the operations of the directorate carries an outstanding significance.

Table 1. Application of lean tools in the operation of Dean's Office

Lean tools	Application example
5S	The introduction of a document management system that follows the 5S principles will reduce the time it takes to find necessary documents and lower the risk of losing valuable information.
Mapping	An analysis of the transfer process may identify redundant stages or duplicated functions, which can reduce the time needed to process a student's request.
Kanban	Using Kanban boards to manage exam retake and consultation requests can prevent overlaps and delays.
Standardization	Standard operating procedures (SOPs) for processing sabbatical requests will help reduce lead times and errors.

Students are key participants in various processes at the university, not only related to educational activities but also in other areas, such as administrative ones. Student satisfaction directly affects the reputation of the institution.

The implementation of lean principles and techniques, such as value stream mapping, standardization of procedures, and the Kanban system, can help reduce processing times, minimize errors, and improve service quality. This includes optimizing processes related to academic certificate issuance and course transfer.

These changes have a positive impact on the corporate image of the institution and enhance student loyalty. As for the personnel aspect, it is worth noting that the staff of the Dean's office performs a significant amount of operational work on a daily basis. They are responsible for document management, accounting document preparation, and coordination between teaching staff and students.

The introduction of lean tools, such as the 5S system, helps to structure work procedures and optimize time for information retrieval. It also reduces stress factors associated with multitasking by standardizing operational procedures. For instance, the ergonomization of the professional environment through the 5S (sorting, maintaining order) system significantly reduces the risk of losing documentation and optimizes access to information assets.

This transformation leads to an increase in operational efficiency and a higher level of professional self-fulfillment among the staff. The introduction of lean production tools has contributed to the development of a culture of continuous improvement in the dean's office.

For example, the Kaikaku system for proposal submission has provided an accumulation of ideas for optimizing the dean's office activities from key stakeholders, demonstrating a synergistic effect that not only increases operational efficiency but also strengthens team spirit and engagement among participants.

This integration of lean tools into the operations of the Dean's Office at the university represents a scientifically sound approach to improving administrative and managerial processes. The implementation of this approach has several benefits:

1. It reduces the duration of task cycles;
2. It reduces errors in document management;
3. It increases the loyalty of the academic community, including students, staff, and faculty.

In today's competitive higher education landscape, universities face increasing pressure to deliver quality educational services. To meet these challenges, it is essential for universities to optimize their operations and improve efficiency.

Administrative, educational, and research processes within universities often suffer from bureaucracy and inefficient resource allocation, leading to decreased satisfaction among key stakeholders such as employees, teachers, and students. To address these issues, universities must adopt modern management approaches to enhance their efficiency and create a more positive working and learning environment.

A model has been developed to analyze the impact of Lean manufacturing tools on participant satisfaction. This model examines the relationship between the implementation of Lean techniques, process optimization, and enhanced satisfaction for all stakeholders involved.

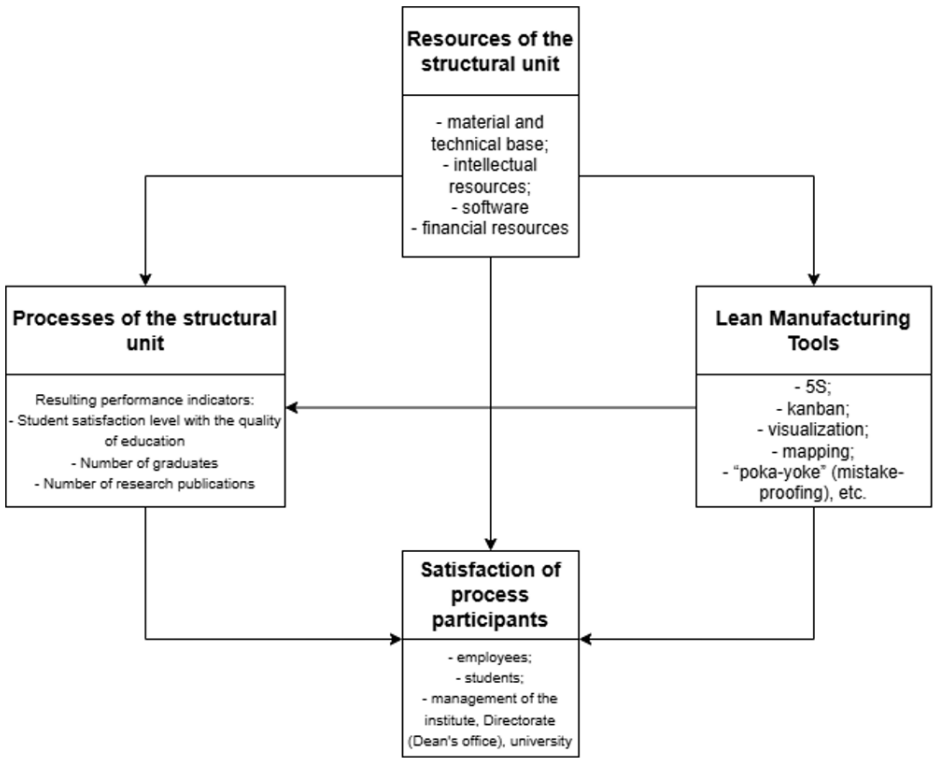
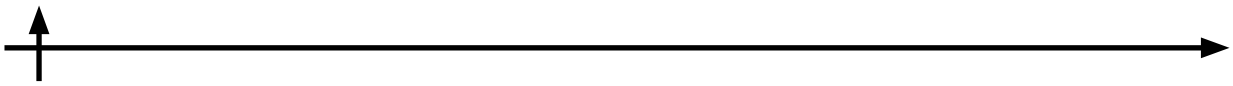


Fig. 1. Model of the lean-tools impact (designed by the authors).



The proposed model illustrates the relationship between the implementation of lean techniques and the level of satisfaction among participants in university activities. It also shows the correlation between the resources, procedures, and tools used in lean manufacturing and the satisfaction level of participants.

The model is based on the idea that optimizing processes through lean tools leads to improved efficiency, reduced costs, and enhanced service quality. This, in turn, positively impacts the satisfaction of university staff, faculty members, students, and other stakeholders.

This model can be seen as a system where resources are inputs, processes are converters, lean production techniques are catalysts for increased efficiency, and participant satisfaction is the result of activities reflecting the effectiveness of the whole system.

Resources form the foundation for the operation of any university department. These include:

- Material and technical resources (classrooms, laboratories, equipment);
- Human resources (teachers' qualifications, staff's scientific potential);
- Information technology (educational management systems, online learning platforms);
- Financial resources.

The availability of these resources—including financial, logistical, human, and informational—has a significant impact on the selection and use of lean manufacturing tools. The development of a set of techniques that ensure maximum efficiency is determined by the specific needs of the organization and its limitations in terms of resources.

Resource potential is a crucial factor in determining the efficiency and quality of operations in structural units. Adequate resource availability is a necessary condition for the sustainable operation and development of processes. Insufficient or inappropriate use of resources can lead to decreased productivity and poor performance. The modern material and technical infrastructure is linked to student satisfaction with the educational experience, while intellectual capital influences the publication activity of graduates and their competitiveness in the job market. Resources also influence the selection of lean manufacturing methods, as their implementation requires specific infrastructure and skills.

It is important to note that optimizing processes through the use of lean techniques can lead to improved performance, which in turn enhances the satisfaction of those involved in the process. Lean manufacturing techniques aim to eliminate waste, increase efficiency, and enhance the quality of work. These techniques have a dual impact: they improve the performance of the organization and the satisfaction of its members.

The interrelation between resources, processes, lean production tools, and participant satisfaction forms a complex system of interdependencies that determines the effectiveness of higher education institutions.

The proposed model demonstrates the complex impact of lean production resources, processes, and tools on the satisfaction of participants in university business processes. It emphasizes the importance of an integrated approach to implementing lean production principles in organizational activities. Effective resource management and the use of lean manufacturing tools are key factors in optimizing processes and increasing satisfaction among all stakeholders.

The implementation of this model can increase the efficiency of university structural divisions and create a favourable environment for all participants in the educational process. However, further research is needed to develop methods for quantifying the impact of each element of the model on the final results of university activities.

Conclusion

Overall, the developed model, which incorporates resource management, process optimiza-

tion, and the use of lean techniques, has a significant impact on enhancing the satisfaction of participants in the university's educational programs. The results indicate that the systematic implementation of the lean methodology not only contributes to enhancing the operational efficiency of the university's departments but also creates a supportive environment, significantly improving both productivity and the quality of educational services.

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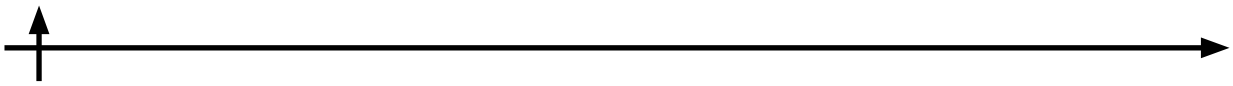

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