

CONDITIONS OF APPLICATION OF LEAN TECHNOLOGIES AT THE UNIVERSITY OF ARTS AND CULTURE

CONDICIONES DE APLICACIÓN DE TECNOLOGÍAS LEAN EN LA UNIVERSIDAD DE LAS ARTES Y LA CULTURA

Posokhova N. V.^{1*}; Merezhko M. E.²; Plyushkina N. E.³; Kistenev V. V.⁴; Kurgansky S. I.⁵

1. SBEI HE “Belgorod State Institute of Arts and Culture”, Russia. science@bgiik.ru
2. SBEI HE “Belgorod State Institute of Arts and Culture”, Russia. merezhko@bgiik.ru
3. SBEI HE “Belgorod State Institute of Arts and Culture”, Russia. n-plyushkina@mail.ru
4. SBEI HE “Belgorod State Institute of Arts and Culture”, Russia. kisvita@mail.ru
5. SBEI HE “Belgorod State Institute of Arts and Culture”, Russia. rektor@bgiik.ru

* Corresponding author: Posokhova N. V., e-mail: science@bgiik.ru

ABSTRACT

The article is devoted to the problem of creating conditions for the application of lean technologies in the university of arts and culture, the need to create prerequisites in a higher educational institution for the preparation of favorable soil, which will allow the effective use of lean technologies. The importance of using lean technologies as an innovative way of developing higher education is considered. The authors reflect on a rethinking of approaches to educational activity, the use of design methods and lean manufacturing in relation to the processes of a creative university. The methods of analysis and synthesis were used in the work, the key, in the opinion of the authors, conditions necessary for the formation and development of the concept of lean manufacturing in a higher educational institution were determined, supported by examples of projects implemented on the basis of the Belgorod State Institute of Arts and Culture.

Keywords: Lean technologies; higher education; Institute of Arts and Culture; lean projects; process factory.

Revista de Investigaciones Universidad del Quindío,
34(S3), 71-81; 2022.

ISSN: 1794-631X e-ISSN: 2500-5782

Esta obra está bajo una licencia Creative Commons Atribución-
NoComercial-SinDerivadas 4.0 Internacional.



RESUMEN

El artículo está dedicado al problema de crear condiciones para la aplicación de tecnologías lean en la universidad de artes y cultura, la necesidad de crear requisitos previos en una institución de educación superior para la preparación de un suelo favorable, que permitirá el uso efectivo de tecnologías lean. Se considera la importancia del uso de tecnologías lean como una forma innovadora de desarrollar la educación superior. Los autores reflexionan sobre un replanteamiento de los enfoques de la actividad educativa, el uso de métodos de diseño y manufactura esbelta en relación con los procesos de una universidad creativa. En el trabajo se utilizaron los métodos de análisis y síntesis, se determinaron las condiciones clave, a juicio de los autores, necesarias para la formación y desarrollo del concepto de manufactura esbelta en una institución de educación superior, sustentado en ejemplos de proyectos implementados en la base del Instituto Estatal de Artes y Cultura de Belgorod.

Palabras clave: Tecnologías lean; educación superior; Instituto de las Artes y la Cultura; proyectos lean; fábrica de procesos.

INTRODUCTION

The sphere of arts and culture is an important area of human life, the task of which is to satisfy the specific needs of a person. The production of unique difficult-to-reproduce objects of material culture is carried out in the process of solving the outlined problem: pieces of painting and decorative and applied arts, musical works, dramatic plays, choreographies. To make the existence and full-fledged functioning of the sphere of arts and culture possible, human resource capacities are needed, that is, specialists involved in creative activity output. Sociocultural universities provide training to specialists in this industry (Krdžalić et al., 2020).

The organization of activities in concerned area implies the establishment and functioning of many processes: enrollment campaign, management of training, research and creative work. At the same time, within the education system, there are a number of auxiliary processes that affect the final result indirectly: logistical support, legal enforcement and staffing, social assistance, volunteering, economic activity and accounting. The set of the described groups of processes is an institutional system of the university. Ensuring the effective functioning of such a system is a priority for the people involved in its management (Kurganskiy et al., 2019).

Improving the processes in the considered university system, addressing the shortcomings that impede its development is a non-trivial task that requires specialists with special competencies, the use of effective methods and tools.

The formation of issues in theory and practice of the management of lean production system in university is prompted by the current transformation of economic systems in the context of innovative approaches to online education in particular and economy in general (Abbassinia et al., 2020).

Lean production is the necessary tools that allow for the optimization of the processes occurring within university (Bogomolova et al., 2021). Lean competencies having been engendered and tested in the production environment are successfully implemented at all levels of education from kindergartens and schools to colleges and universities. However, in practice lean technologies should be adopted

not via modeling and following the patterns servilely, but via thoughtful adapting to specific tasks. Interestingly, the adaptation process in the university of arts and culture differs significantly from other focus areas due to its specificity. The educational process has a distinct personified character. Many disciplines involve the one-on-one interaction of teachers with a student or in a small group. Most of special creative disciplines are implemented exclusively using a student-centered approach, not the other way round – it is impossible to teach playing a musical instrument, plastic dance, processing ceramics or metal by applying only unified standards.

Hence, there are a lack of time on the part of teachers, loss of time in the form of waiting on the part of students, mistakes in preparation of a large number of training materials. This is the top layer of problems revealed by a cursory look. Yet a deeper study of the problems of educational process has exposed other problems: inadequate level of mastery of information and communication technologies; scheduling conflicts due to the employment of students in city, regional, federal creative events, excessive time expenditures when navigating students in educational buildings due to the design features of buildings the university has (Mullakhmetov et al., 2019).

In addition, the presence of such techniques as “improvisation”, “author’s vision”, “interpretation”, “creative reading” of educational material is allowed in a number of specialties, which, of course, enriches the future specialist, however, on the other hand, complicates the process of unification of standards and educational trajectories, encouraging educators to find compromise solutions for effective learning.

Creative thinking and outlook of some teachers and students are in conflict when trying to interact with the administrative structures of university, working under strict regulations. The current situation, in turn, motivates specialists in the field of lean management to maximize the points of intersection, try to develop interaction algorithms by mapping processes, find losses and try to eliminate them.

METHODS

An important factor that played a decisive role in the fact that preference was given to the lean manufacturing toolkit was its versatility and eased adaptation.

]The planned improvements per se are a positive moment in the context of the activities of the organization’s employees, however, their being unmethodical and isolated from the strategic goals, from the mission of the university, can ultimately lead to negative effects since they will not work as a team.

The BSIAC implements the Sustainable Innovative and Creative Development Program. This guide aims to ensure sustainable innovative and creative development of BSIAC by improving the quality of education and enhancing competitiveness in Russian and international markets for scientific and educational services and the creative industry through the integration of scientific, creative, personnel, material, technical and managerial potentials of the institute and the region.

The designated priority tasks the solution of which should be reached at all levels of the institution’s functioning contribute to achieving the objective.

RESULTS AND DISCUSSION

In accordance with experts' vision, a hierarchy of priority directions for the development of BSIAC in a strategic perspective is being arranged. These directions are as follows:

1. learning activity (by default);
2. creative activity (100% of experts consider this area to be of priority);
3. scientific work (79,71%);
4. international activities (65,22%);
5. social work (53,62%);
6. personnel functions (52,17%);
7. financial and economic activity (43,48%).

Correlation of the concerned areas with the SQDCM goal management system is as follows: S (safety) – social and educational work. We associate safety with the formation of a comfortable environment for the main client of the services we provide – a student (see Fig. 1 and 2).

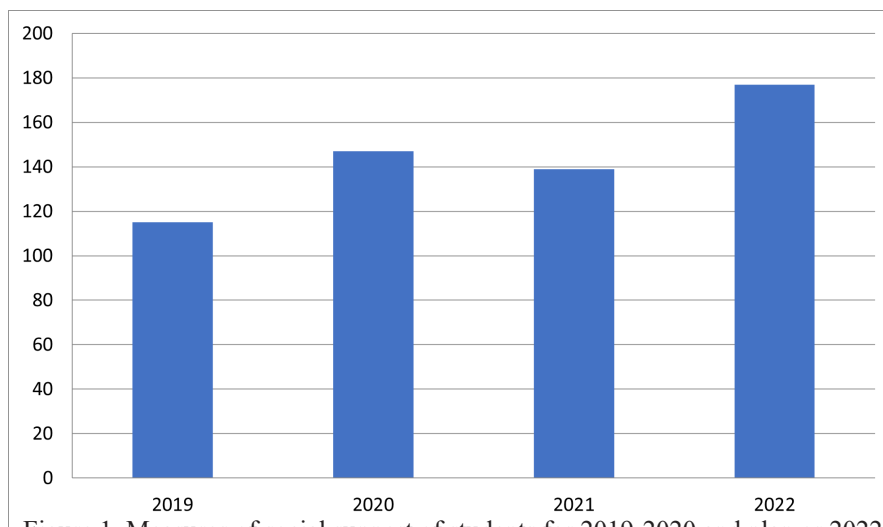


Figure 1. Measures of social support of students for 2019-2020 and plan or 2022

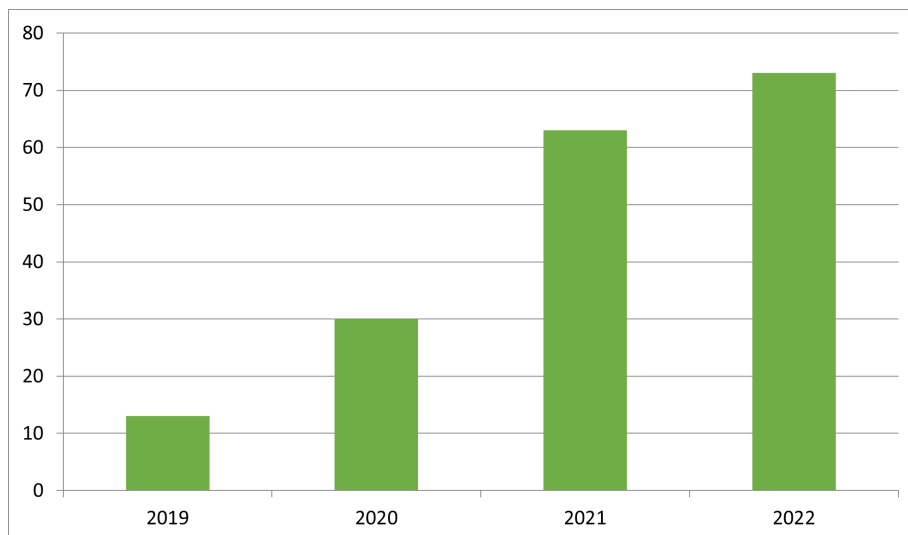


Figure 2. Dynamics of the growth of student associations in the BSIAC for 2019-2022 and plan for 2022

Q (quality) refers to learning activity (see Fig. 3):

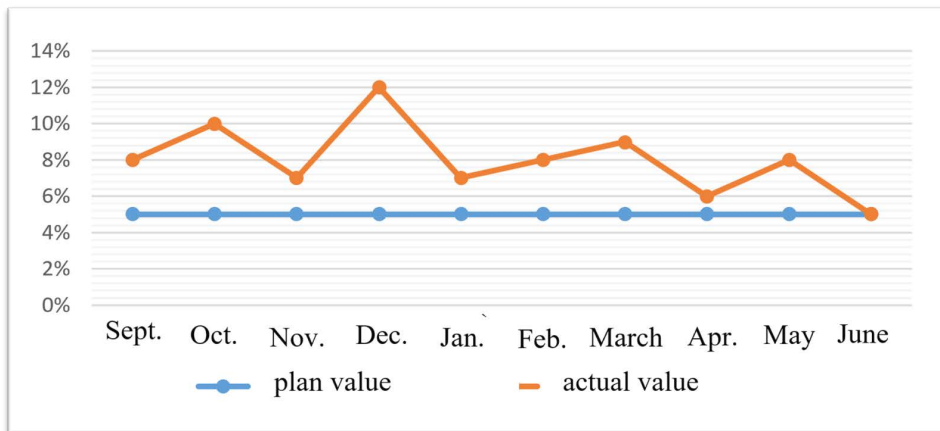


Figure 3. Hours of students absence from lessons without good cause in 2019-2020 academic year

D (delivery of orders) – in this section there are performance indicators of personnel management and international activity (work of the admissions committee, work of the international center to attract foreign students) (see Fig. 4 and 5).

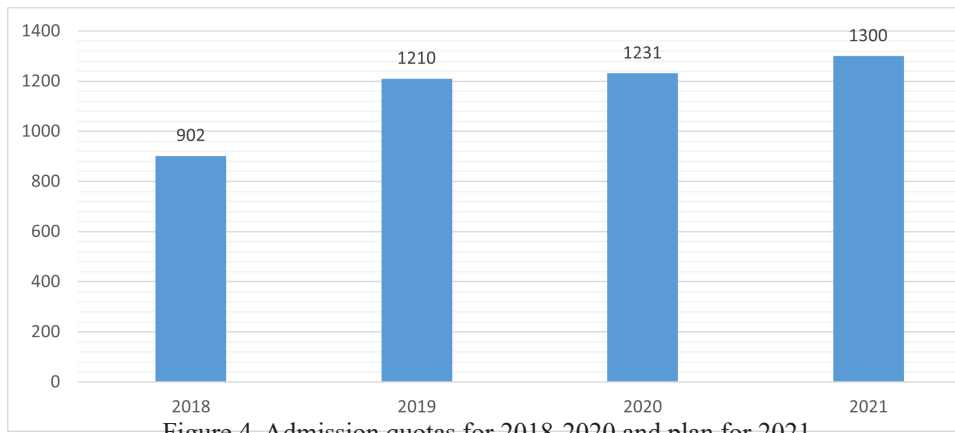


Figure 4. Admission quotas for 2018-2020 and plan for 2021

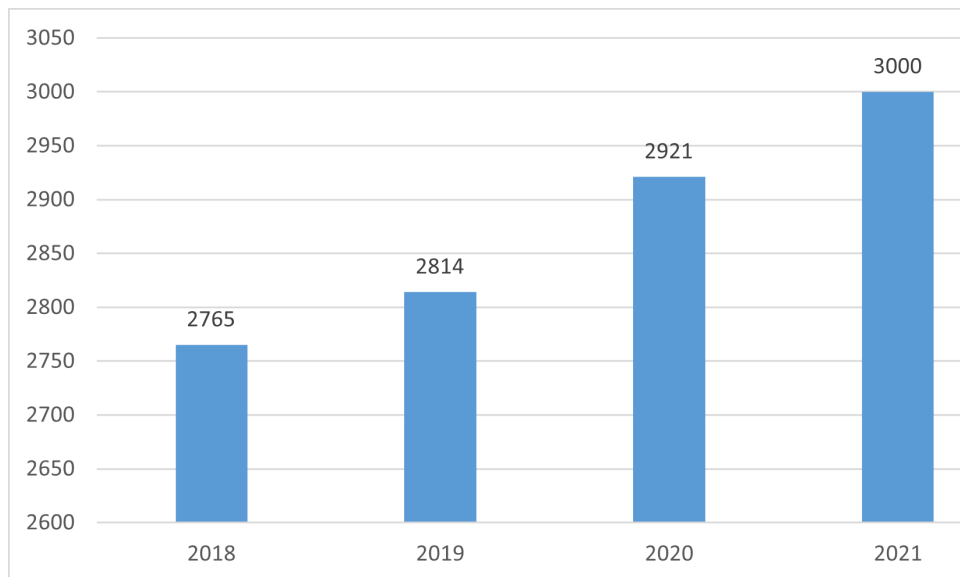


Figure 5. Numbers of students for 2018-2020 and plan for 2021

C (costs) are indicators of financial and economic, creative and research activities (see Fig. 6). Figure 7 “The number of registered objects of intellectual property” reflects the results of both scientific and creative activities, expressed in an objective form and received protective documents – certificates and patents:

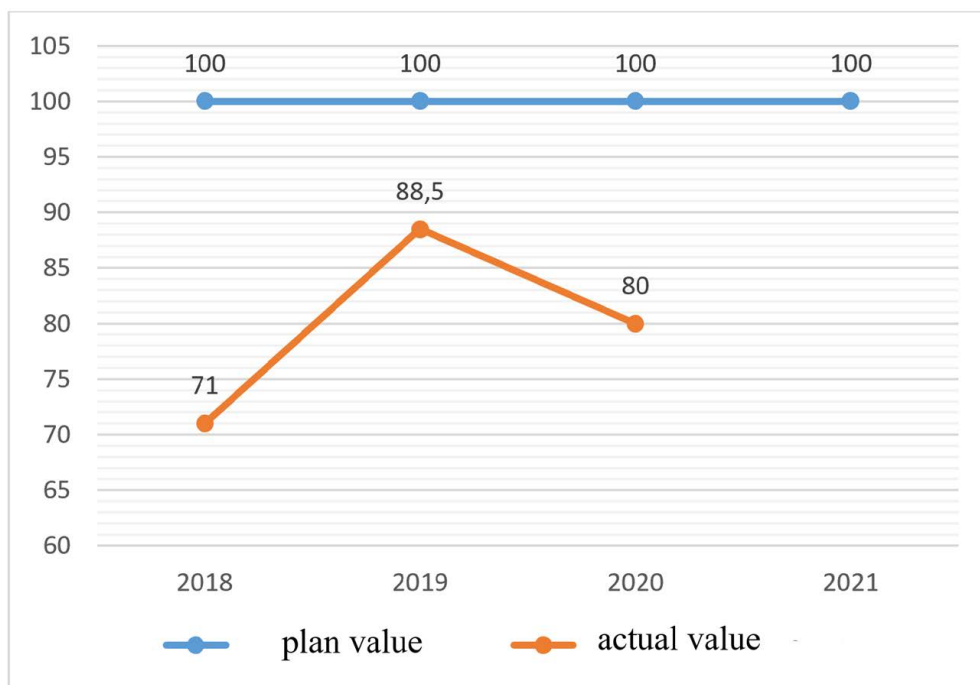


Figure 6. Performance of income generating activities for 2018-2020 and plan for 2021 (Thousands of roubles)

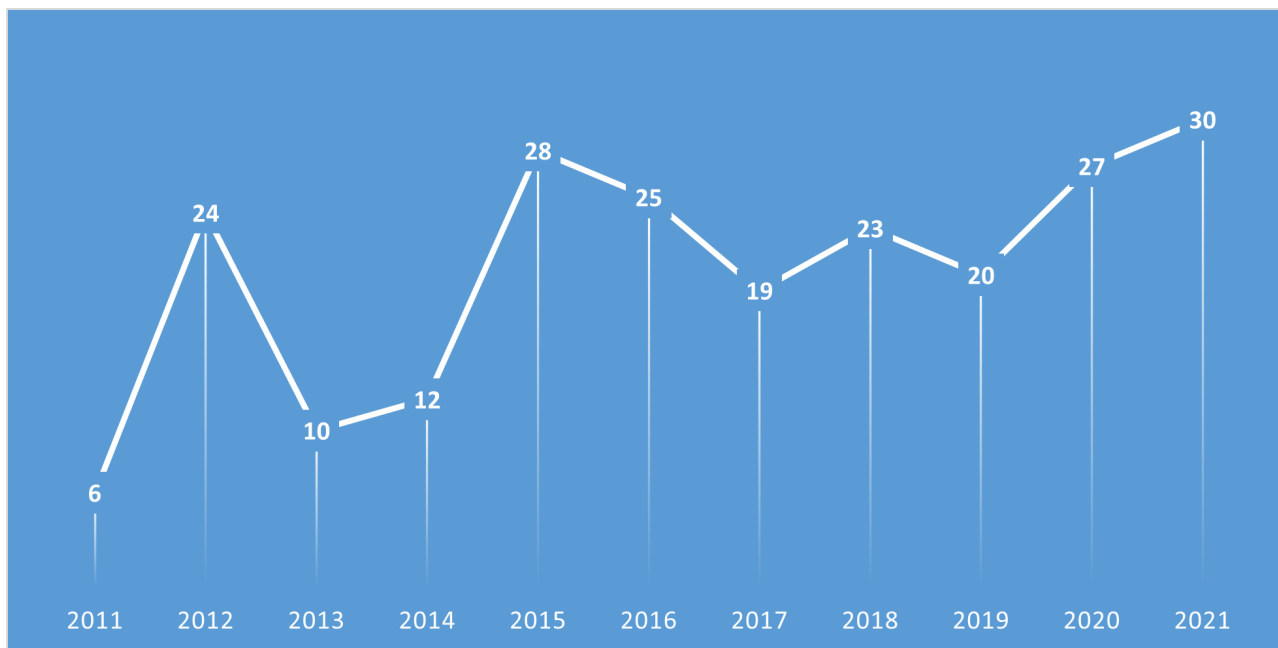


Figure 7. Numbers of registered intellectual property’s objects for 2011-2020 and plan for 2021

M (Morale) includes human resource development indicators (see Fig.8) and the indicator “Dynamics of Professional Development of Teachers”, correlated with educational activities (improved quality of education).

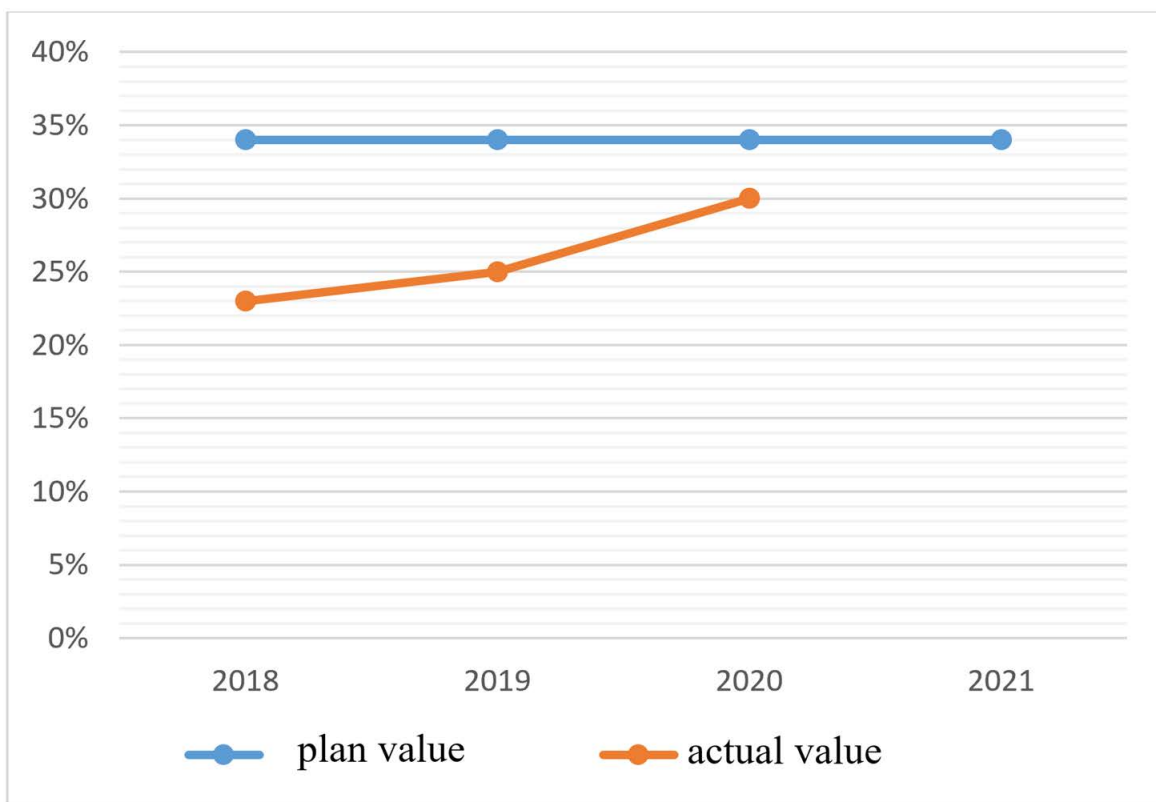


Figure 8. The dynamics of upgrading qualifications of teaching staff for 2018-2020 and plan for 2021

Thus, thanks to the SQDCM system, it became possible to efficiently monitor the key strategic indicators of the university development, adjust it, and form up tactical objectives that correlate with strategic ones. Thus, arrangement of a harmonious system of goals has been achieved: there are no contradictions within the hierarchy, everything is targeted at a common result.

The indicator of the number of registered intellectual property objects (hereinafter referred to as IPO) is strategic, since in the long term it reflects the development potential of the institute's innovative activities, and, consequently, the potential for the commercialization of registered results of intellectual activity, the economic efficiency of the university. The dynamics over the years makes it possible to predict the development of the university in the indicated direction in order to achieve the desired results.

This indicator is also included in the report on the results of monitoring the performance of educational institutions in the section "research activities" and expresses the result of the tactical task on the number of registered objects over the past year.

At the local level, the indicator of the implementation of the plan for registering IPO is carried out by employees of the intellectual property department at time intervals of a smaller scale – a month and a quarter. Thus, with low indicators, for example, in the first quarter, it is possible to adjust the tactical plan by mobilizing efforts at the operational level. This is achieved by holding events aimed at increasing the activity level of the higher-education teaching personnel, point projects with individual authors, holding workshops, organizing competitions for the best IPO of the institute in conjunction with the International Day of Intellectual Property

Key Conditions for Application

1. One of the key conditions for the use of principles of lean technologies is understanding the need for changes (Cudney & Furterer, 2020). Awareness and readiness of getting outside of the comfort zone for the sake of transition to a qualitatively new level of functioning are qualities inherent in the team of not every institution. The notion that the management and processes are well-functioning and the streams are optimized is sometimes too tempting to refuse. This illusion lulls sound ambitions and craving for development, thereby leading to a decrease in competitiveness, a loss of attractiveness for customers, and the risk of being out of the market for services delivered. The solution of the listed risks is the task facing organizational leadership (Betzler et al., 2021).

Therefore, in order to prepare a stepping stone for adopting lean technologies, first of all, it is the leadership of the university that is to be ready (Flew & Kirkwood, 2021), ready for applying lean technologies and relaying existing competencies to junior colleagues.

In February 2019, the leadership of BSIAC, represented by the rector, vice-rectors, heads of structural divisions, successfully completed qualification upgrading courses, including both the analysis of theory and the development of practical skills, as well as participation in the process-enterprise of the Belgorod State Research University.

The result of the training is the mainstreaming of lean competencies in solving strategic tasks facing university by the leadership (Florescu & Barabas, 2022), the implementation of SQDCM methods, their correlation with the University Development Strategy. Also, during the year, several large projects have been executed by representatives of the administration of the institute. These projects have affected the activities of the entire university:

“Optimization of the management system of stage outfit at BSIAC” is a project aimed at improving the system of accounting, storage and issuance of stage costumes. Concert and performance activities are an integral part of the educational process in a number of specialties. The collection of costumes was large, but it was fragmented, the institute had 8 scattered storage facilities, which created considerable inconveniences for both students and teachers and wardrobe staff: there were errors when issuing suits, the search for costumes was difficult, sometimes students had to go around several wardrobe rooms before finding the required suit (up to 47 minutes just to go around all the dressing rooms, taking into account that the student is not a freshman and clearly understands where each of the storage facilities is and find the right suit). The time spend for searching was also reduced through the introduction of an automated accounting system. Now it takes approximately 4 minutes 30 sec. for a student or a teacher to get the required stage costume, i.e. the procedure has been cut down to almost 10 and a half times.

“Modernization of the process of preparation of material-and-technical facilities by way of the example of the Small Hall of the BSIAC” is a project within the framework of which the modernization of material-and-technical equipment and the remodeling of the Small Concert Hall of the BSIAC were carried out. The aim of the project was to reformat the space to make it possible to arrange paid concerts for an external customer, primarily general education and preschool institutions. Since the condition of the hall was partly critical, potential events were associated with risks to children’s life and health. Thus, it was necessary to use alternative sites of the university in a restricted mode, which led to the obvious missed profit out of booking. The renovation of the hall, purchase of new

equipment, organization of the space of the auditorium and the stage in accordance with modern safety and comfort standards made it possible to increase the number of monthly concerts and performances from 3 (at alternative venues) to 12 in a specially adapted Small Concert Hall.

2. The next key condition is insight into the problem. Acquaintance with the tools, the study of existing experience allows:

- to make to the task solution as clear as can be;
- to frame an action plan drawing from capabilities of the educational organization;
- to choose the most effective tools;
- to identify areas for implementation of lean technologies as soon as possible.

For the achievement of this condition, it is essential to organize and conduct training. Within the framework of the courses held in the BSIAC in December 2019, 26 people were trained, who received certificates of advanced training. The course was attended by top managers of the institute: deans of faculties, their deputies, heads of departments, heads of structural divisions. These employees, albeit not all of them, have also become the authors of successful lean projects. By sharing their experience with colleagues in the working environment, they became popularizers of the concept of economical habits, which in turn provoked the next wave of interest: within the framework of trainings at the BSIAC process enterprise that opened in March, another 40 employees were trained. The launch of the very enterprise was also packaged into the project:

“Organization of the process enterprise at the BSIAC” is a project that has taken place at the workshops of the Faculty of Design and Technology. Its implementation made it possible to fully realize a practical component of professional development of workers of cultural institutions of the region who have already been undergoing theoretical training at the BSIAC. The participation of members of the Institute in the process enterprise made it possible to master practical skills and abilities of lean production, as well as to apply them within the framework of professional activities.

3. Another necessary condition, in our opinion, is the determination of a deadline for implementation. Devising strategic and tactical plans with a detailed roadmap (Alagić, 2019), with the appointment of the responsible ones for the blocks of work will personalize responsibility, as well as facilitate monitoring of the execution of orders. The importance of time constraints in planning is due to the fact that any change even if it leads to a positive result cannot last as long as desired. Endlessness stresses out the performer, creates the effect of an endlessly stretching procedure, reduces motivation, negatively affecting the result.

CONCLUSION

Thus, despite the uniqueness of some of the challenges facing the university, it is quite obvious that the use of lean technologies to solve them is fully justified. The key conditions necessary for compliance in the process of applying lean competencies, from the perspective of the authors of the article, are universal and can be borrowed by specialists from other fields of activity. We will briefly list them again:

1. Realization of the increasing demand for change. With all the non-obviousness of changes for some managers, the use of systems of continuous monitoring of indicators, the organization of feedback,

the conduct of sociological research are the minimum set of tools that allow you to see reason why introducing lean management is needed.

2. Understanding the topics and immersion in the philosophy of economy. It is important to demonstrate to junior colleagues through personal example the effectiveness of using lean production methods that enable not only to increase impersonal indicators, but also to show an improvement in the “quality of life” of an employee, relieve them of routine processes, and eliminate losses arising in the process of professional activity. This can be done only by having absorbed the basis: to acquire the necessary knowledge, skills and abilities in the learning process. This can often be done without discontinuing work.

3. Planning. Effective management that implies a clear delineation of tactical and strategic tasks, an adequate assessment of one’s own capabilities, a SWOT analysis in the process of working on a lean project, a strict time limit for procedures and operations planned for improvement (Klein et al., 2021). The application of the listed conditions, based on the experience of the Belgorod State Institute of Arts and Culture, makes it possible to take a step towards qualitative changes using lean management tools.

In 2019, the BSIAC successfully implemented nine projects, in 2018 there were only five. According to the preliminary results of the first half of 2020, 7 projects are already in various stages of planning and preparation. The main results of implementation of the projects were an increase in customer-focusedness, a reduction in time in performing services, elaboration of visual frameworks and manuals, correction of errors, development and modernization of new and existing regulations, formation of an electronic information educational environment, working-out of educational trainings in new fields, including the basics of lean production.

REFERENCES

- Abbassinia, M., Kalatpour, O., Motamedzadeh, M., Soltanian, A., & Mohammadfam, I. (2020). The application of lean production in reducing human error and improving response in emergencies: A case study in a petrochemical industry. *Iranian Journal of Ergonomics*, 8(2), 39-49.
- Alagić, I. (2019, June). Kaizen in practice-case study of application of lean six sigma method in working condition of wood-processing firm. In *International Conference “New Technologies, Development and Applications”* (pp. 189-198). Springer, Cham.
- Betzler, D., Loots, E., Prokūpek, M., Marques, L., & Grafenauer, P. (2021). COVID-19 and the arts and cultural sectors: Investigating countries’ contextual factors and early policy measures. *International journal of cultural policy*, 27(6), 796-814.
- Bogomolova, I. P., Krivenko, E. I., Kocharyan, A. G., & Tigranyan, V. Z. (2021). Application of resource-efficient technologies in the framework of lean management of industrial enterprises. *Vestnik Voronežskogo Gosudarstvennogo Universiteta Inženernyh Tehnologij*.
- Cudney, E. A., & Furterer, S. L. (2020). Lean Six Sigma in Higher Education: State-of-the-Art Findings and Agenda for Future Research. In *Lean Six Sigma in Higher Education*. Emerald Publishing Limited.
- Flew, T., & Kirkwood, K. (2021). The impact of COVID-19 on cultural tourism: Art, culture and communication in four regional sites of Queensland, Australia. *Media International Australia*, 178(1), 16-20.
- Florescu, A., & Barabas, S. (2022). Development Trends of Production Systems through the Integration of Lean Management and Industry 4.0. *Applied Sciences*, 12(10), 4885.
- Klein, L. L., Tonetto, M. S., Avila, L. V., & Moreira, R. (2021). Management of lean waste in a public higher education institution. *Journal of Cleaner Production*, 286, 125386.

-
- Krdžalić, A., Brgulja, A., & Durakovic, B. (2020). Implementation of Lean Practices in a Higher Education Institution's Student Affairs Office: A Case Study from a Bosnian University. *International Journal on Advanced Science, Engineering and Information Technology*, 10(2), 567-577.
- Kurganskiy, S., Kireeva, O., Belogortseva, I., & Kireeva, N. (2019). Analysis of foreign and Russian experience in implementing Lean Technologies in educational institutions. *Dilemas Contemporáneos: Educación, Política y Valores*, 7(1).
- Mullakhmetov, K. S., Sadriev, R. D., & Akhmetshin, E. M. (2019). Influence of corporate culture on the system of management in modern conditions. *Entrepreneurship and Sustainability Issues*, 7(2), 1098.