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SELECTED ISSUES OF USING LEAN MANAGEMENT IN UNIVERSITY MANAGEMENT

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Purpose: The aim of the article is to present an analysis of selected elements of Lean Management - barriers in management systems and methods of improvement on the example of public universities in Poland.
Design/methodology/approach: The article is a theoretical and empirical study presenting selected results and an analysis of the survey results. The study was conducted on a group of 58 public universities in Poland in 2021-2022.
Findings: The analysis of the research results presents the characteristics of selected barriers in the management systems of the analyzed universities. The answer to the existing barriers is the presentation of selected methods of improvement undertaken by the managers of the surveyed universities in order to minimize or eliminate them.
Research limitations/implications: The limitations relate to the conducted study and result from the selection of selected barriers in university management systems for the study and the ways of improving these systems. Therefore, some of the barriers or ways of improvement may have been omitted, which will be taken into account in subsequent research and articles.
Practical implications: The results of the study show the barriers in management systems in the surveyed universities, which are often a source of waste and other problems. As part of the study results, university managers indicated which improvement methods they take to counteract the existing barriers.
Originality/value: The added value of the article is a study conducted on a group of public academic universities in Poland in the field of implementation of selected elements of Lean Management.

Keywords: Lean Management, university, improvement.

Category of the paper: Research paper.

1. Introduction

The analysis of the literature on the subject and research conducted in Poland and around the world indicates a fundamental tension in the development of university management, related on the one hand to the expansion of management ideas and methods, and on the other hand to

resistance to their application. The development of management concepts and methods can be illustrated by both at the level of solutions concerning academic governance and management within the universities themselves. On a macro scale, in more and more countries, higher education systems and universities are developing towards entrepreneurial universities, moving further and further away from the idea of a traditional Humboldt university. Manifestations of this transformation may be, for example, trends in the growing importance of the market and competition in science and education, commercialization of research, professional university management moving away from the model of "academic self-governance". On the micro and mezzo scale, there is a rapid increase in the importance of management concepts and methods within the universities themselves, which can be exemplified by the functional areas of strategic management, financial management, quality and process management, as well as the areas of marketing and human resources management. The challenge for Polish universities striving to improve their academic activity is the effective implementation of management concepts and methods that have been developed in many good universities around the world (Sułkowski, 2017, p. 11). One of them is Lean Management (Lean, LM).

Lean Management is a business strategy and not a toolset. Lean is the willingness on each hierarchical level to question one's own behavior, to learn from mistakes and to continuously develop new solutions towards waste-free processes. Lean stands for permanent customer-focused and value-adding thinking and acting. Lean has mainly been developed for and applied in the area of manufacturing. However, various activities have shown that the idea of Lean can be applied in the administrative service sector as well. However, how can it be applied in a very special service sector, that of higher education? Everywhere, and thus also in higher education, we are confronted with an increasing degree of complexity. In the past, universities were able to focus on their core competencies: research and teaching. However, today, universities are competing in a global market, with a declining number of potential students, and staff members who would gain much higher salaries in the private market. As a consequence, universities now need to become "decathletes" with ten different skills: excellence in teaching, excellence in online distance learning, excellence in research and development, excellence in gaining research funds, excellence in providing service to students, excellence in managing international partners, excellence in alumni management, excellence in cooperation with companies and knowledge transfer, excellence in ranking management and accreditation and excellence in self-marketing (Höfer, Naeve, 2017, pp. 64-65).

The article is a theoretical and empirical study on the analysis of selected elements of Lean Management at public universities in Poland. The theoretical part of the article presents selected information regarding the concept in question, primarily meaning of Lean Management in Higher Education.

The research part of the article presents selected results and analysis of the results of the survey, which was conducted on a group of 58 public academic universities in Poland in 2021-2022. As part of the analysis of the results of the survey, the barriers present in the management

systems of the surveyed universities were presented, as well as the improvement methods undertaken by the managers of these universities as a response to the barriers.

2. Meaning of Lean Management in Higher Education

In order to use the large scientific and didactic potential of many Polish universities, it is necessary to improve the management of academic organizations. Many organizational solutions used in good universities around the world are innovative and based on a continuous process of learning and improvement. Polish universities should use such benchmarks and implement their own innovations in this area, using good international models. Development strategies may depart from the traditional planning form and move towards an evolutionary approach. The organizational structures of universities can be transformed from hierarchical, often ossified linear solutions, towards flexible solutions, taking the matrix, tensor or network forms. Changing academic cultures can move from traditional Humboldtian university values to entrepreneurial and innovative cultures (Sułkowski, 2017, pp. 11-12; Dyrdal Solbrekke, Sugrue, 2020; Jakubiec, 2021).

Lean Management constitutes a management concept that has been successfully implemented by enterprises and organizations around the world. In Poland, an increasing number of organizations can boast of successful implementations of this concept. The concept of Lean Management is of Japanese origin. It derives from the Lean Thinking philosophy, implemented in the terminology of economics and management by J.P. Womack'a, D.T. Jones'a and D. Roos'a, scientists representing the Massachusetts Institute of Technology (Womack, Jones, Roos, 1990; Womack, Jones, 1996). It should be added, however, that the first term of lean production was used by J. Krafcik, who in 1988 published a work entitled Triumph of the Lean Production System (Krafcik, 1988, pp. 41-52). The concept of Lean Management has been developed in Toyota Motor Company as part of the Toyota Production System and has been used and developed over the years in the production plants of this brand (Lisiecka, Burka, 2011, p. 14; Lisiecka, Burka, 2016, p. 15; Bhasin, 2015). The core of the Lean Management concept is the production process, but it is now being used successfully in the service sector.

Recently organizations are more and more recognizing the potential of Lean Management for different services and industries, resulting in new approaches for and adaption to the respective area, with Lean Management serving as a basis. It is transferable to a wide variety of industrial areas, for example to higher education – Lean Higher Education (LHE). LHE refers to the adaption of Lean thinking to higher education for the benefit of improving academic and administrative operations (Pötters, Szedlak, Leyendecker, 2019, p. 1725). According to W.K. Balzer'a "LHE is a problem-solving framework used to increase the value and

performance of university processes. Grounded in the principles of continuous improvement and respect for people, the successful application of LHE will meet the expectations of those served by processes, engage and develop of employees who deliver the processes, and enhance the efficiency and effectiveness of the university" (Balzer, 2020, p. 16; Balzer, Francis, Krehbiel, Shea, 2016, pp. 442-462).

Thanks to use of Lean in area of education the Lean House in Higher Education has been created (transformation of the components of the so-called Toyota Production System House), figure 1 (Höfer, 2016, pp.189-208; Dyrdal Solbrekke, Sugrue, 2020; Grudowski, Wiśniewska, 2019, pp. 49-61; Hines, Lethbridge, 2008, pp. 53-56; Kucheryavenko, Chistnikova, Thorikov, Nazarova, 2019, pp. 687-705).

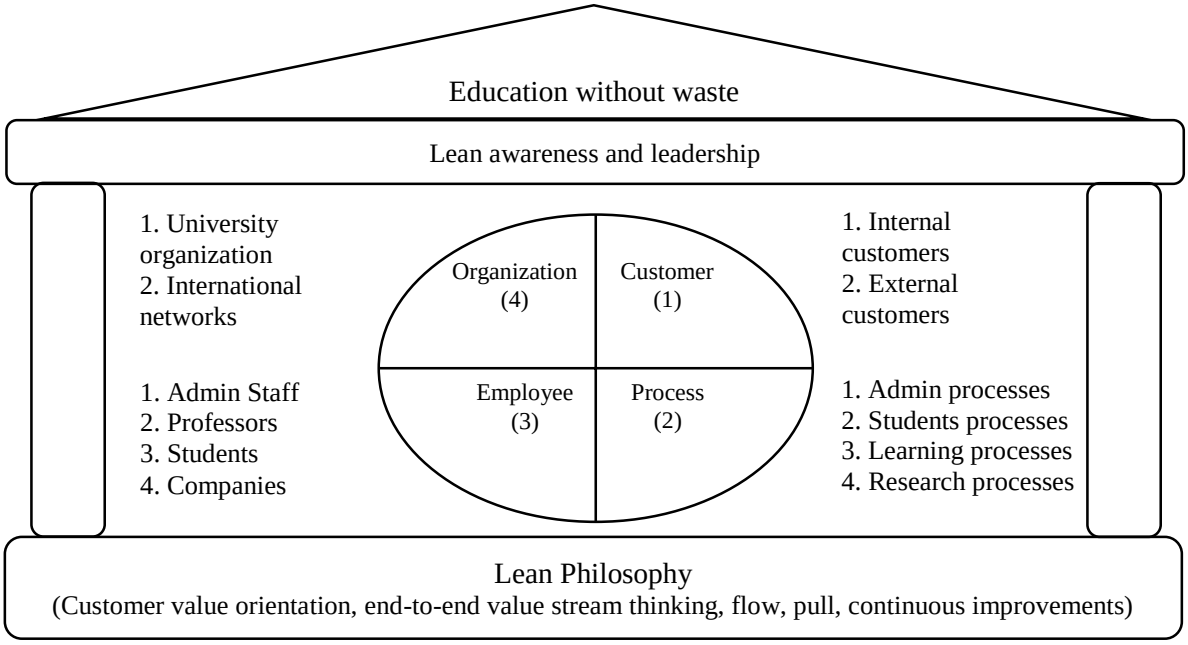

Figure 1. The Lean House in Higher Education. Adapted from: "The aplication of Lean Management in Higher Education" by S. Höfer, J. Naeve, (2017).

Lean House calls for a change in philosophy and organizational culture in university management. It is important to properly understand the requirements of the internal (employees, students, doctoral students) and external (candidates for studies, co-operators and stakeholders), orientation on the process approach and implementation of process management, as well as continuous improvement, which means, among others, the use of a number of management instruments such as tools for quality management and improvement.

Lean management is the expression of the willingness on each hierarchical level of a higher education institutions to question one's own behavior, to learn from mistakes and to continuously develop new solutions towards waste-free processes. It stands for permanent customer-focused and value-adding thinking and acting. Lean management is a humanistic concept of management based on profound self-reflection on organizational, technical, and cultural conditions of a university. It is based on two fundamental values that are close to the traditional academic ethos: respect for people and constant striving for perfection.

In the operational dimension, the implementation of these values is manifested through actions aimed at increasing the value created for the school's stakeholders (students, employees, scientists, lecturers, etc.) by simultaneously minimizing or eliminating all sources of waste (Thomas, Francis, Fisher, Chilton, 2013, p. 43; Vukadinovic, Djapan, Macuzic, 2016, pp. 35-50).

The fundamental features of the Lean Management concept are striving to improve the broadly understood quality, minimize costs and shorten the time of process implementation as a result of the systematic elimination of waste as part of management based on a flat organizational structure. Lean Management stands for process-focused management. Properly implemented principles of process management may be a factor supporting the adaptation of the Lean Management concept. Process management, aimed at achieving the synergy effect to achieve the goals of an organization, has become the basis for "lean management" for the comprehensive improvement of the management system. The key goal of process management and the Lean Management concept based on it is the elimination of rigid functional structures. Instead of this ineffective model, the Lean Management concept introduces a flattened and horizontal organizational structure that focuses on processes and knowledge accumulation, while decomposing the strategic goals into the goals of processes and individual positions along the value chain. Process management in the Lean Management concept concerns not only operational processes, but also auxiliary processes, without which the proper functioning of an organization would not be possible (Wiśniewska, Grudowski, 2014, pp. 34-38; Wolniak, 2014, pp. 157-166).

The implementation of Lean Management means the implementation of five fundamental principles on which the concept is based. These principles are (Litvaj, 2023, p. 17):

1. Identification of the value stream – value must be specified for the product from the customer's point of view.
2. Elimination of waste (Muda) – cancelling of all identified and unnecessary waste like activities, tasks, processes, etc.
3. Ensuring the flow of activities in the processes – make value flow without interruption along the value stream.
4. Process control by means of a pull system – an organization must establish pull and let the customer pull value from the supplier/producer.
5. Constant pursuit of the perfection – an organization must strive for the perfection.

Lean Management creates a new approach for HEIs. It raises both concerns and hopes.

Lean Management is an effective, comprehensive methodology aiming for the reduction of nonvalue adding activities. Defining value, mapping and redesigning processes in order to provide continuous improvement, eliminate waste and to focus on customer expectations are among the major principles of Lean (Grudowski, Wiśniewska, 2019, p. 52; Balzer, Francis, Krehbiel, Shea, 2016, pp. 442-462).

3. Research method and results of analysis

This part of the article presents selected fragments of the research carried out in 2021-2022 at public academic universities in Poland. The analysis of the research results presents the characteristics of selected barriers in the management systems of the analyzed universities. The answer to the existing barriers is the presentation of selected methods of improvement undertaken by the managers of the surveyed universities in order to minimize or eliminate them. Fifty-eight public universities took part in the study. The return of completely and correctly completed questionnaires was received from 38 universities, which gave a return of 65%. Table 1 presents the assumptions related to the conducted study.

Table 1.
Assumptions of the research

Items	Description
Research goals	Theoretical: Presentation of selected information regarding the concept in question, primarily meaning of Lean Management in Higher Education. Practical: Analysis of the barriers in the management systems of the surveyed universities, as well as the improvement methods undertaken by the managers of these universities as a response to the barriers.
Research method	Survey study.
The interviewees	The Rectors and other managers and employees suggested by the rectors of 58 public academic universities in Poland.
Date of realization	Two years: 2021-2022.

Source: personal elaboration.

The characteristics of selected research results began with the identification of barriers in the management systems of the surveyed universities. The following barriers were identified for the study:

1. Constant changes in the law, forcing a change in management directions of the university.
2. Large formalization and bureaucratization of management.
3. Poor integration of employees with the organizational unit.
4. Employees avoiding responsibility and self-solving problems.
5. Disapproval of the academic community to changes in the concept of management.
6. High independence of employees, especially the habilitated.
7. Focus on tasks, not processes.
8. Lack of implemented management through processes.
9. Implementation of often contradictory goals by organizational units/departments/ groups/employees.
10. Lack of ongoing monitoring of the achievement of goals.
11. Application of corrective actions, lack of risk estimation, and thus, none taking preventive measures.

12. Not seeing the right client (student, doctoral student) and not creating value, for both the client and the individual.
13. Failure to identify the causes (sources) of waste/problems.
14. Waste of many resources, such as money, time, office supplies, etc.
15. Supply orientation in terms of the educational offer (focus on resources, not on market requirements).

During the study, the respondents were asked for an assessment on a scale of 1 to 5, what impact the barriers have on the university management system. The analysis of the response results includes the averaged impact forces of individual barriers (figure 2).

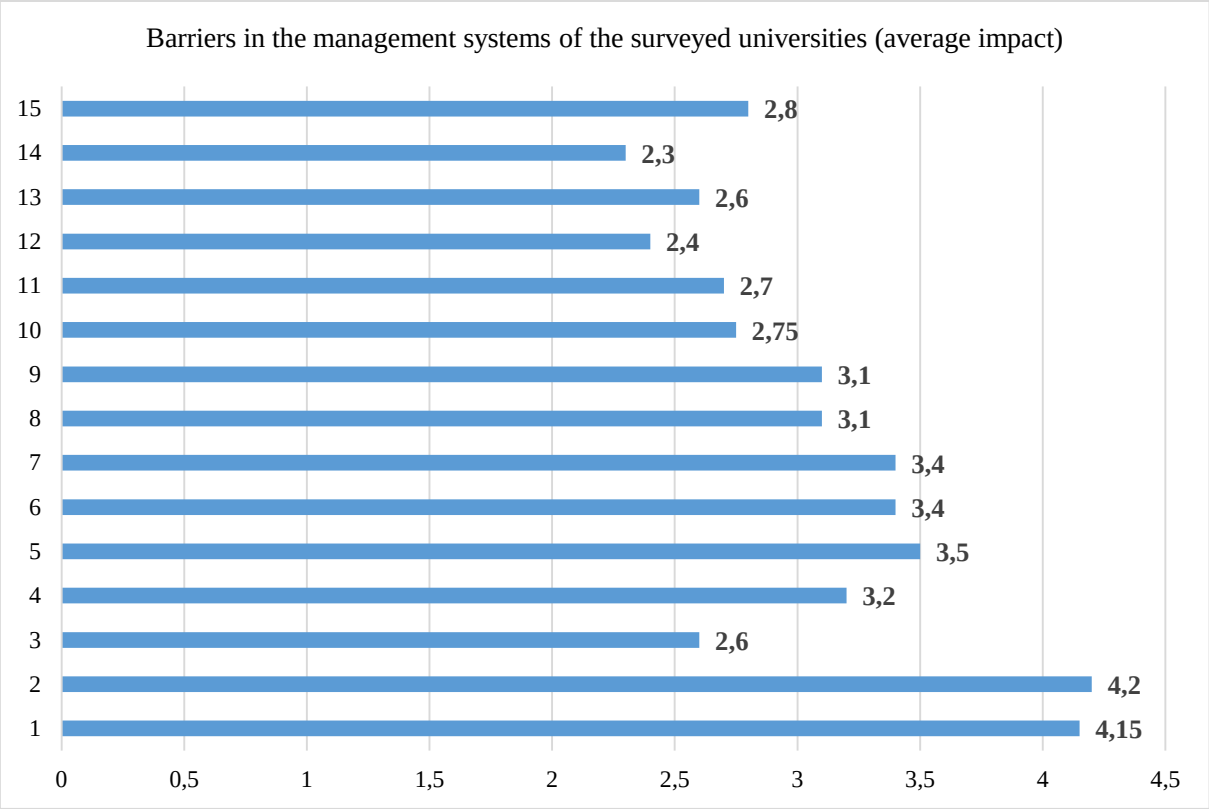

Figure 2. Barriers in the management systems of analyzed universities.

Source: Personal elaboration based on research results.

On the basis of the study, it was found that the average impact strength of barriers in university management systems for all 38 surveyed universities was 3.08. In view of such a result, for analytical purposes, an average impact force of 3.0 was adopted as the limit value, which should be considered high. As a general conclusion, it can be noted that eight barriers present in the management systems of the analyzed universities affect these systems in a strong and very strong way. These are the following barriers, taking into account the strength of their impact:

1. Large formalization and bureaucratization of management (4.2).
2. Constant changes in the law, forcing a change in management directions of the university (4,15).
3. Disapproval of the academic community to changes in the concept of management (3,5).
4. High independence of employees, especially the habilitated (3,4).
5. Focus on tasks, not processes (3,4).
6. Employees avoiding responsibility and self-solving problems (3,2).
7. Lack of implemented management through processes (3,1).
8. Implementation of often contradictory goals by organizational units/departments/ groups/employees (3,1).

Next, barriers with an average impact force were specified:

1. Supply orientation in terms of the educational offer (focus on resources, not on market requirements) (2,8).
2. Lack of ongoing monitoring of the achievement of goals (2,75).
3. Application of corrective actions, lack of risk estimation, and thus, none taking preventive measures (2,7).
4. Poor integration of employees with the organizational unit (2,6).
5. Failure to identify the causes (sources) of waste/problems (2,6).
6. Not seeing the right client (student, doctoral student) and not creating value, for both the client and the individual (2,4).
7. Waste of many resources, such as money, time, office supplies, etc. (2,3).

Identifying barriers in university management systems is essential for their proper functioning. Referring the identification of barriers to Lean Management, it is a contribution to the use of specific methods of improvement and the use of various instruments of the concept.

The analysis of the results of the study in terms of existing barriers shows that the barriers with the highest impact strength are the barriers that have been a problem for Polish universities for many years. Changes in the law, and thus the constant bureaucratization and formalization of management, combined with the unfavorable attitude of some of the academic community to changes, create barriers to the implementation of solutions such as Lean Management. Process orientation is also necessary. This is difficult to implement, but not impossible. The processes at universities are formalized to some extent, for example through education quality assurance systems. It is important to transfer this to the faculty level and then to the whole university. Management through processes is the next step to broadly understood improvement. Thanks to process management, it is possible to delegate responsibilities and powers more effectively, properly define internal and external customers, monitor goals on an ongoing basis, as well as reduce resource consumption depending on processes and take actions to prevent the occurrence of barriers.

It is also important to convince employees that the changes are right. There is a need for training, motivational meetings and awareness of the effects that can be achieved thanks to the implementation of Lean Management assumptions. This should also affect the relations and attachment of employees to the organizational unit.

A detailed analysis of the answers to this question showed that the greatest number of barriers were identified in universities and technical universities, the least in the group of economic universities.

The occurrence of barriers in management systems causes specific problems in the implementation of processes, tasks or the functioning of individual university units. Therefore, in this context, specific ways of improvement should be undertaken as a response to emerging barriers and allowing to eliminate them or minimize the effects of their occurrence. In the course of the study, selected methods of improvement were analyzed and their application was assessed, also on a scale from 1 to 5.

As part of the study, the following ways of improvement were analyzed:

1. Implementation of management through processes.
2. Ongoing monitoring of process implementation.
3. Establishing responsibility for individual processes.
4. Flattening the organizational structure - appointing ad hoc teams to implement processes (solving problems).
5. Implementation of the so-called Continuous Improvement - use of available Lean Management instruments.
6. Better identification of internal and external customer needs.
7. Involving the external client in the implementation and improvement of processes.
8. Identification of causes (sources) of waste.
9. Reducing the waste of resources.
10. Reducing bureaucracy at universities.
11. Implementation of management through quality - orientation towards a learning organization myself.

Figure 3 presents the average assessment of the application of individual improvement methods.

The average degree of application of selected methods of improvement in the surveyed universities from all 38 analyzed surveys was 2.73. As the limit value of the average degree of application of the analyzed methods of improvement, 3.0 was adopted and considered sufficient. The results of the study show that only two methods of improvement exceed this value: flattening the organizational structure - appointing ad hoc teams to implement processes (problem solving) - (3.25) and identifying causes (sources) of waste (3.05). The remaining 9 analyzed methods of improvement should be considered as methods with a low degree of application.

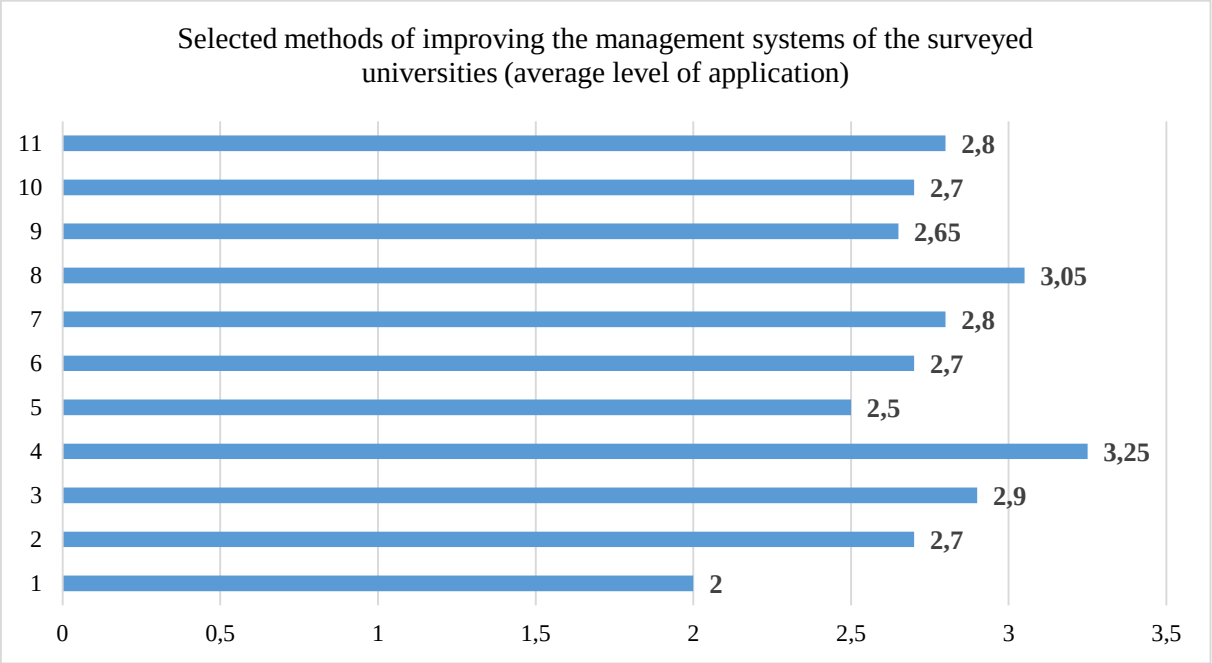

Figure 3. Methods of improving used by surveyed universities. Personal elaboration based on research results.

In the author's opinion, the results of this study are quite surprising. They show relatively low marks for the degree of application of selected methods of improvement, and two methods that are above the 3.0 mark, despite the fact that they constitute the assumptions of Lean Management, do not emphasize other important assumptions, such as proper identification of internal and external customers at the university and the inclusion of him in the implementation of processes. The analysis of selected ways of improvement draws attention to the fact that taking the right ways of improvement is the answer to emerging barriers. In this area, one can see the need for further education in the field of management quality and improvement of management quality by undertaking appropriate improvement methods. The implementation of appropriate methods of improvement by universities may contribute to more effective achievement of the assumed goals and organizational improvements across the university.

It should be emphasized that the implementation of a significant part of improvement methods that have received a low degree of application depends directly on the rector or other persons from the management of the university. These are e.g., ways of improvement such as: implementation of management through processes, implementation of continuous improvement and the use of Lean Management instruments, reduction of waste or less bureaucracy of universities. The methods of improvement mentioned above refer to the assumptions of Lean Management and their adoption will undoubtedly contribute to the increase in the importance of the concept and its application.

4. Summary

The article is a theoretical and empirical study presenting selected results of a study carried out on a group of public academic universities in Poland. The subject of the study concerned the analysis of the Lean Management concept in terms of its assumptions, elements of the concept culture and Lean improvement instruments.

As part of the presentation of selected research results, reference was made to the most common barriers in the management systems of the surveyed universities. As a response to emerging barriers, ways of improvement undertaken by university managers were presented.

The analysis of the survey results showed that among the barriers with the greatest impact, the following were indicated: high formalization and bureaucratization of management, constant changes in the law, forcing changes in the directions of university management, unfavorable attitude of the academic community to changes in the concept of management, high independence of employees, especially independent scientists, concentration on tasks, not on processes, employees avoiding responsibility and solving problems on their own, lack of implemented management through processes and the implementation of often conflicting goals by organizational units/departments/groups of employees. This is not a closed catalog, but only an indication of those barriers that appear as typical problems in the functioning of the surveyed universities.

As a response to emerging barriers, the surveyed universities implement methods of improvement with the use of Lean Management instruments. However, the assessment of the use of selected methods of improvement in the surveyed universities was low. The assessment was made on a scale from 1 to 5. The assessment level of 3.0 was considered sufficient. Only two methods of improvement exceeded this level: flattening the organizational structure - appointing ad hoc teams to implement processes (solving problems) and identifying causes (sources) of waste. The above results regarding the methods of improvement show that the surveyed universities still undertake actions that are not adapted to the emerging problems. In this regard, it is crucial that the methods of improvement allow to eliminate or minimize the effects of existing barriers. It is justified to continue educating and raising awareness of the managers of the surveyed universities in this regard.

In the summary of the article, it should also be mentioned that the study in general terms contributed to an increase in awareness among the managers of the surveyed universities regarding the assumptions of the concept in question. This fact may be a turning point for a wider application of the concept.

The possibilities of further and wider use of the assumptions of Lean Management and its instruments in the surveyed universities and other universities depend on the awareness and need for broadly understood improvement of the university management system, processes and services. It is important to verify emerging problems and barriers in university management on

an ongoing basis and to undertake improvement methods in response to the above, using specific Lean Management instruments. It is also necessary to strive for greater implementation of the elements of the Lean Management culture, resulting from such assumptions as the process approach or the appreciation of the role of human capital.

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