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## MODERNIZATION OF QUALITY MANAGEMENT SYSTEM OF HIGHER EDUCATION INSTITUTIONS

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**Introduction.** With increasing competition in the market of educational services, a necessary condition for successful development of higher education institutions is the continuous improvement of existing management system towards a common integrated quality management system.

This management approach serves to improve the level of teaching and the educational system in general and ensure the most efficient utilization of all available resources.

**The aim.** To determine the general direction of modernization of the total quality management system in higher education institutions based on ISO standards.

**Methods.** In this article, the following general scientific empirical and theoretical methods as were used (the problems and benefits of implementing ISO 9001: 2015 "Quality Management System" and ISO 50001: 2011 "Energy management System") as well as

"Quality Management System" and ISO 50001: 2011 "Energy management System") as well as systems analysis (to determine whether use approaches and international standards for quality management decision-making).

**The results.** The feasibility of implementing a total management system based on integrated ISO standards for higher education institutions have been investigated.

**Conclusions.** Recommendations for implementing integrated quality management system based on international standards ISO will allow optimizing management processes in higher educational institutions of Ukraine.

**Keywords:** resource consumption, quality management system, energy management system, a series of international standards ISO, higher education.

**Problem and its connection with important scientific and practical tasks.** Gradual globalization and economic integration into the Single Global Economic Space on the background of the rapid decrease of resources and increase of the cost turn problem of effective use into one of the most pressing, both for the international community as a whole, and for each individual organization or enterprise in particular. This issue is relevant for higher education. Competitive environment nowadays to achieve sustainable success of the management system of higher education institution (HEI), regardless of the direction of profiling, it needed to quickly adapt to the effects of internal and external factors. Economic leverages force universities to focus on innovation to create conditions for appropriate level of quality–scientific and educational process, based on the cost optimization in general as well as reduction of the expenses for energy consumption in particular.

Currently, scientists have developed a number of conceptual models and strategies of universities to solve urgent problems based on the theory of innovation management, systems of quality of the educational process, design of integrated approaches to management, reengineering, and complex mechanisms for effective resource management, and more.

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Before each manager stands a question of choosing the most effective, but at the same time less costly management approach, using which, universities can become a leader in its field. However, inept use or disregard of the latest management systems would throw universities in zone of outsiders. As one of the most proven and effective management approaches currently considered the quality management system (QMS) developed on the basis of the standards of the International Organization for Standardization (ISO).

Thus, best practices and achievements of leading companies who have implemented these standards - is the basis for a management decision as to form an effective management system. However, a large number of existing standards that may be implemented by institutions (*such as the series of standards: ISO 9000 Quality Management System; ISO 50000 Energy management system; ISO 14000 Environmental Management; BS OHSAS 18001 (draft of ISO 45001 in implementation process) Health & Safety Management System; ISO 26000 Social responsibility; ISO 27000 Information security management; ISO 37000 Anti-bribery management system to fight corruption; ISO 31000 Risk management; ISO 10001 Quality Management - Customer Satisfaction, etc.*) it is necessary to attract a lot of resources (human, material, financial, etc. ) requires a decision to determine the optimal economically viable integrated set of standards for the implementation in educational institution.

**Analysis of recent publications about the problem.** Modern approach to quality management, defining the basic principles and concepts of innovation management and sustainable guarantees for efficient operation are based on the fundamental studies of world scientists such as: G. Emerson, A. Fayolle, H. Ford, W. Shewhart, W. Deming [15], J. Juran, P. Crosby, A. Feigenbaum, K. Ishikawa, G. Taguchi, and supplemented by modern authors such as E. Aspinwall, M. Owlia, [25, 26], and others.

The main achievements of national scientists on introduction of modern quality management systems in higher education is formed by: B. Agranovich [7], I. Bulakh [9], O. Volosovets , Y. Voronenko, A. Volkov [11], L. Vitkin [10], G. Himicheva [17], O. Hafforova [12, 13], V. Zagorski and others.

**The unsolved parts of the study, the purpose of the study.** Nowadays, the lack of experience and skills in implementing the set of researched standards, insufficient of skilled individuals, and limited or slow uptake of management approaches, uncoordinated interventions, limited monitoring and scattered use of management approach leads to inconsistencies of systemic managerial issues affecting the performance of the high educational institution. For the time being, there are non-integrated internally developed management systems still prevails among the vast number of universities in Ukraine. Most of them are used fragments from known concept of total quality management (TQM).

Such approach reduces the efficiency of education process quality and ignores the growing risks of the financial burden of increasing expenses on its own activities.

**The main results and their justification.** Worldwide practice shows that each country has its own approach, not only to the development of higher education but also to finance, scientific, administrative and educational processes in high education institutions. Differences in approaches give rise to the need to study the problems of modernization of higher education system to provide good financial management.

As a consequence is the actualization of the task of integration of existing system into a balanced system of management, the mission of which is to ensure a single set of conditions for increasing competitiveness of higher education institutions, enhancing research, educational services to the satisfaction of all the parties concerned.

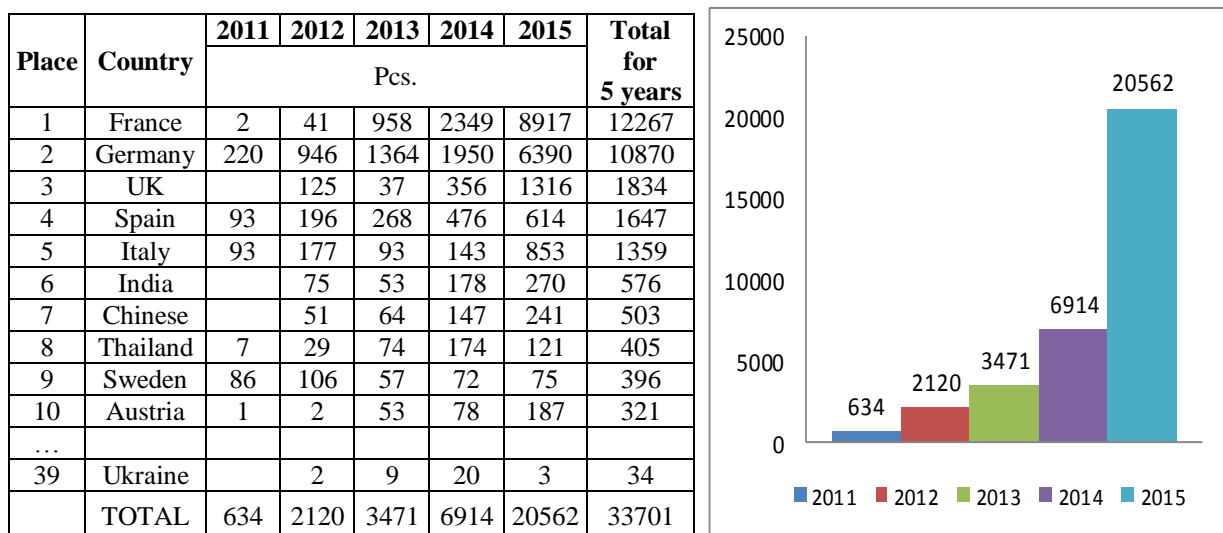
In this sense, a simple logical solution is implementation of quality management system of the educational process based on ISO standards with the subsequent restructuring of the higher education institution on the basis of an integrated quality management system (IQMS). However, should be noted that this system requires significant resources, so rather slowly introduced into the Ukrainian market of educational services.

In this case particularly relevant is the question of implementation due to reorientation of the new version of ISO standards from industrial segment towards services sector and enhancing the role of "process approach.

Although there are obvious positive perspectives in the management of higher education institutions if IQMS is implemented, some experts say [19] that the integration process could become the reason to increase the cost of resources for the development, implementation and difficulty of perception by users due to increased volume of documentation etc. Therefore, criticism goes toward management approach when the existing system is proposed as an annex, and does not create a harmonized system, built to process integration and standardization of functions within a single quality management system.

By results of a research it is established that a single database containing the number and type of ISO certification of high education institutions currently unavailable. First of all it is due to the large quantity of accredited certification bodies the number of which reaches almost 800 centers around the world. The overall picture of the implemented quality system in compliance with ISO standards was highlighted in the annual review of the ISO secretariat [6]. For example, analysis of an existing online databases on a network of certified and registered universities in the International Certification Network Association certification IQNet (Bern, Switzerland) shows the current limited set of implemented standards at ISO 9001 and ISO 14001 only.

However, starting from the first universities certified in 2011, «College Cork University, Ireland; Sheffield Hallam University's, United Kingdom; worldwide universities actively promote the certification in accordance with ISO 50001, which in turn confirms the effectiveness and relevance of these standards and which should be used in Ukraine (Figure 1). The growing popularity of ISO 50001 is due to its economic orientation to reduce energy resource costs and is characterized as energy management process with an explicit focus on performance and continuous improvement [18, 30]. The basic difference relating to ISO 50001 compared to other "classical" (ISO 14001, OHSAS 18001) is the direction to increase in efficiency of use of energy resources and reduction of expenses, and according to the author opinion, this standard has to have a high priority to be implemented in Ukraine education sphere.



**Fig.1 Number (pcs.) of certified objects according to ISO 50001 in the world, based on statistical data of the International Organization for Standardization ISO, in 2015 [2].**

Among these “key benefits” of ISO 50001 implementing which are very varied in nature, it is possible to distinguish the following effect of the renewed stimulus efforts in particular:

- to ensure the logical framework to identify priorities and assess the consistent implementation of energy management programs and energy efficiency measures;
- to help in the organization of effective use of the existing and potential power assets;
- to energy resources saving and environment protection;

- to involve scientific and educational personnel and student's community to creation of prerequisites of formation of energy saving culture and effective use of energy resources;

- to determine the possibility of energy resource economy due to more effective utilities operation

- to reduce the air emissions of greenhouse gases and other impacts on the environment,

The collection of ISO 50001 standards is being constantly updated, and reviewed every five years in accordance with current market requirements. The revised version of ISO 50001 is expected to be published in 2019. Currently, the following standards are under development by committee of ISO / TC 301:

– ISO 50007. Activities related to energy services –Energy services -- Guidelines for the assessment and improvement of the energy service to users.

– ISO 50008. Commercial building energy data management for energy performance - Guidance for a systemic data exchange approach.

– ISO 50021. General guidelines for selecting energy savings evaluators

– ISO 50044.. Energy Savings Evaluation -- Economics and financial evaluation of energy saving projects.

– ISO 50045. Technical guidelines for evaluation of energy savings of thermal power plants.

– ISO 50046. General quantification methods for ex ante or expected energy savings.

– ISO 50049. Calculation methods for energy efficiency and energy consumption variations at country, region and city levels: relation to energy savings and other factors.

Intended implementation of ISO 50001 at universities in Ukraine is determined by a number of regulatory legislation and national programs for energy efficiency, including those developed by the Ministry of Education and Science of Ukraine [4].

At present, every university has own management system, which it uses in its work. The problem lies in the fact whether it satisfies the requirements of international standards.

In the educational field, there are three most used international quality standards:

– Standards and directives of European Association for Quality Assurance of Higher Education (ENQA) in Europe;

– European Excellence Model of the European Foundation for Quality Management (EFQM);

– Standards ISO 9001 of International Organization for Standardization.

However, to work efficiently, universities have to create an appropriate quality management system with maximum synergies in all areas of its operations.

According to this approach, activities to improve the quality and development of ISO integrated system are based on the implementation of the four stages, so-called the Shewhart-Deming cycle: surveillance; collection of information; development of measures to improve quality; implementation; analysis. This cycle is better known by the acronym PDCA, which means: P – planning (Plan), D – implementation (Do), C – check (Check), A – action / entry regulations (Act).

Development and implementation of an integrated quality management system is based on ISO 9001 and can be implemented in two ways:

- Gradual integration with expanding the scope by introducing other ISO standards;
- Simultaneous integration of multiple standards of ISO series.

This especially becomes important, because the release of the new international standard ISO 9001: 2015, which contains a number of significant changes that bring this standard to a new level, compared to the previous version of ISO 9001: 2008. The new version of the standard in the first place among other benefits is aimed to facilitate the development of integrated quality management systems (IQMS) and focuses on:

- harmonizing the structure of the standard with uniform section title;
- introducing the risk management models, in contrast to the use of corrective and preventive actions in previous versions;
- taking into account factors that can affect the stability of the system to the influence of external factors such as energy use, materials procurement, environment and internal factors (corporate culture, organizational discipline, etc.);
- simplification of the documentation procedures and reduction of their required number, by introducing a new term "documented information";
- reducing the number of quality management system principles;
- changing the philosophy of the final product of the organization by introducing the term "goods and services" instead of the term "product" and many others.

In other words, the key changes in the new standard can distinguish orientation of IQMS and gradual transition from "industrial" approach to "service". To service it is possible to carry fields of activity and system of ensuring quality of the higher education.

The quality assurance system of higher education can be classified as "the service» correspondingly. Thus, creating a classic integrated management system based on ISO 9001, which, depending on the availability of resources

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and willingness can complement the desired list of other ISO standards. The above-mentioned management system can be characterized as those areas of activity:

- creating of a common management culture in the field of scientific and educational process, energy efficiency, safety, risk management;
- establishing the uniform standards in all areas of the university activities;
- encouraging staff interested in improving the level of quality management to energy efficiency, environmental protection, safety, risk management without impairing someone's interests;
- reducing the risk of non-compliance in activity, which potentially important now or that would be needed to university tomorrow;
- formatting and ensuring measures for effective and rational improvement of all areas of the organization;
- developing the set of integrated documentation including instructions to achieve a good level of development;
- strengthening the leading role of top management, who considers the overall process management based on comprehensive business strategy and development plan;
- integrated approach to policy and objectives;
- integrated approach to planning and management system
- integrated approach to internal audit;
- integrated approach to process improvement (corrective and preventive actions, measurement and continuous improvement);
- confidence that requirements are met and therefore reduce their monitoring;
- comprehensive management and accountability.

As the area of IQMS covering does not include other components of general management (financial management, personnel management, innovation management, etc.), the main focus in control and quality assurance in higher education is an educational process. It should be noted that the plan of IQMS implementation includes many things that can be strengthened or levelled to successful results. Some of them are the following:

- IQMS is philosophy and management tools;
- IQMS is a long-term commitment, not a short activity;
- the process of implementation and application can take several years and which consists of many steps and items depending on the structure, direction of educational activities and facility status;
- necessity to allocate sufficient time and resources to develop IQMS;
- simplification and cost reduction.
- decreasing the number of processes, rules and regulations, delaying the process of implementing I IQMS;

– adopting an aligned process of interaction with stakeholders.

Taking into consideration analyses and all listed above, the author proposes a scheme of integrated quality management system.

The main elements of the integrated quality management system are (Fig. 2):

1. Educational services.
2. Processes: basic and subsidiary.
3. Resources: tangible, financial, human, information (software)
4. Interaction with the environment.
5. Project, knowledge, change, risk, innovation.
6. Internal environment.

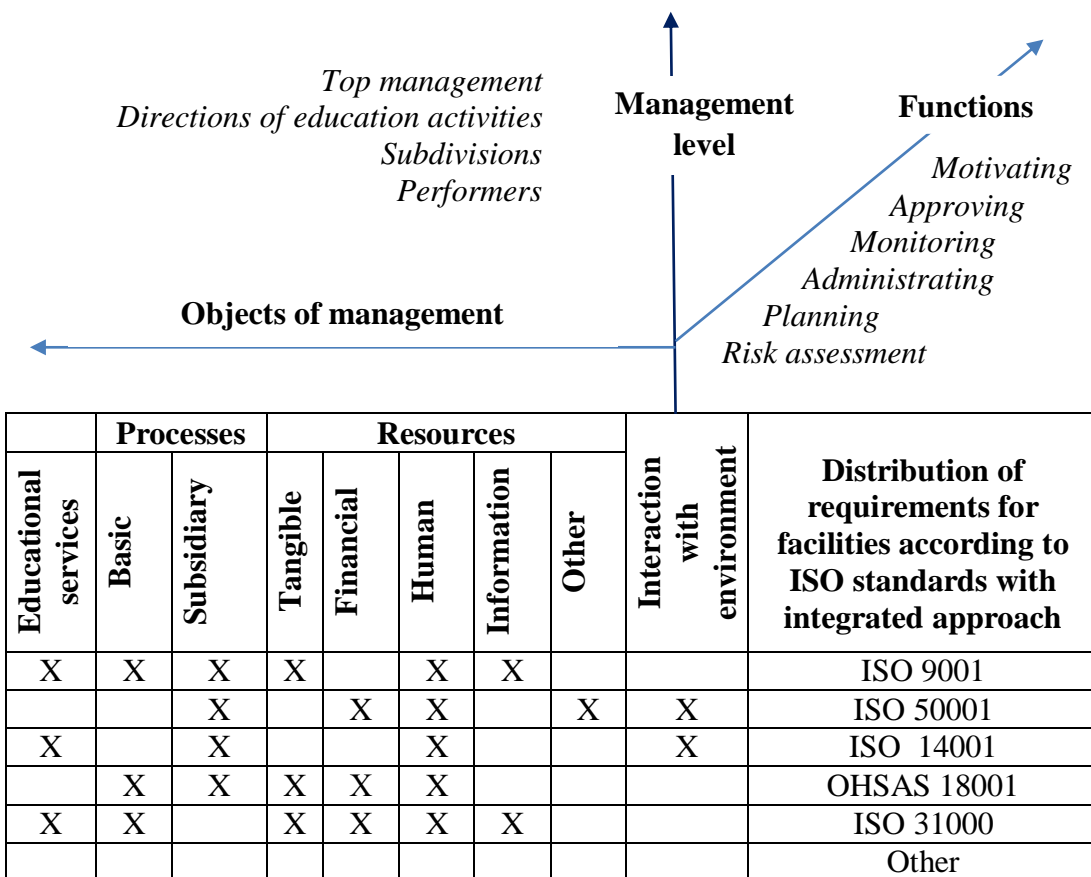


Fig.2. The scheme of integrated quality management system of Universities

**Conclusions and prospects for further research.**

The status of quality management systems certification based on ISO have been analysed shows that the educational institutions actively pass the certification process during recent years, worldwide.



The most popular are certification in accordance with the requirements of international standard ISO 9001, ISO 14000, BS OHSAS 18001 as well as the number of ISO 50001 have been growing rapidly.

In the present economic situation in Ukraine, this challenge is particularly acute at strengthening efficiency and competitiveness of quality management systems. This approach focused on changes from “policy of stability” to the “policy of innovative changes” is aimed at continual improvement and comprehensive to ensure effective financial condition with economical use of resources.

The development and implementation of demand-driven integrated standards ISO 9001 and ISO 50001 is a new challenge that the higher education institution faces, requires further research, "motivating factors" including consideration of ways and means to ensure the rational implementation of integrated system.

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