The Specifics of Conducting Research Work at the Tver State Technical University

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Abstract: The publication is devoted to the issues of documentary, informational and organizational support for the activities of the university. The work focuses on one of the most important areas in the university - scientific activity. To improve the quality and expand the field of research and work, the university rebuilt its management system, providing scientific activities with material, human resources and the necessary documentation to the maximum.

1 INTRODUCTION

The problem of effective management of modern enterprises is acute in modern conditions, in universities it is even more acute, due to their specificity. At present, the vast majority of domestic enterprises, as in most universities, use functional management. One of the possible ways to create an effective management system is to use a process approach. One of the main directions for creating an effective management system for an educational organization is the application of a process approach to organizing and managing the activities of an enterprise - the basic principle of the ISO 9000 series standards. Analogues for use in the Russian Federation are the standards of the GOST R ISO 9000 series (GOST R ISO 9000, 2015, GOST R ISO 9001, 2015).

The implementation of a quality management system at the university in accordance with the requirements of the ISO 9000 series requires the use of a process approach in management. The essence of this approach is that an activity that uses resources and is managed in order to transform inputs into outputs is considered as a process. Often, the output of one process directly forms the input of the next one, respectively, the output parameters of the previous process affect the quality of the next one, therefore, quality management of each process is necessary to ensure the quality of the functioning of the organization as a whole (GOST R ISO 9000, 2015, GOST R ISO 9001, 2015).

The founder and the state are currently paying great attention to the training of highly qualified personnel. However, much attention is paid to scientific activity at the university. Research associates and scientific and pedagogical workers of higher education are involved in carrying out scientific work in priority areas of state development. The requirements of contracts to ensure the quality of work performed determine the development of local acts, which include requirements for analyzing and preventing risks, for ensuring that manufactured products meet customer requirements, for continuous improvement of production processes, for developing and maintaining QMS documentation, as well as for ensuring regular improvement of personnel competence. In addition to university staff, students of all levels can also be involved in the work. They solve the tasks set by teachers and researchers and at the same time develop their intellectual capabilities, increasing their competitiveness in the labor market. Research teams and collaborations are formed to solve

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specific problems and practical tasks. Their project activities are also regulated by local acts that are developed at the university.

The basis of an effective QMS is well-designed documentation that: meets the requirements of the selected standard, reflects existing processes, includes both necessary existing documentation and additional ones, has an orderly structure, format and methods of documentation, and is developed by groups of competent workers. Also an important requirement of ISO 9001 Quality Management System. Requirements - is the organization of review and approval of documentation before its release (GOST R ISO/TO 10013, 2007).

If an organization plans to implement a quality management system, it should:

- determine the processes necessary for the effective implementation of the quality management system;
- establish the interaction of these processes;
- document the processes, to the extent necessary, to ensure the effective functioning and management of these processes (GOST R ISO 9001, 2015).

In order to improve management efficiency for QMS processes, information cards have been developed at the university, which reflect:

- the purpose of the process (a brief statement of the purpose of the process);
- process manager: a leading specialist who is responsible for developing and ensuring the further normal functioning of the process, including updating it in cases of changes, additions or the development of a new edition;
- process input: documents, resources and other information needed to begin developing process procedures;
- output of the process: developed documents, manufactured products, performed service, etc. in accordance with the purpose of this process;
- input requirement: mandatory conditions that documents, resources, etc. must comply with, given in the «process input» column;
- output requirements: mandatory conditions that must be met by documents, manufactured products, performed services, etc., listed in the «process output» column;
- resources to carry out the process: personnel, materials, infrastructure;
- criteria for evaluating the effectiveness of the process;
- weight coefficients of criteria in accordance with their significance;
- the value of the criteria that determine their scoring;
- frequency of performance evaluation (quarterly, half-yearly, yearly);
- monitoring parameters: what is determined when monitoring the process;
- monitoring methods: information on how monitoring parameters are determined during monitoring (Makarov V.V., 2012).

The quality management system of the university, in accordance with the standard model, includes the main and supporting processes.

The main processes of Tver State Technical University include: marketing, design and development of educational programs, pre-university training, admission of students, implementation of basic educational programs, educational and extracurricular work with students, design of additional education programs, implementation of additional education programs, training of highly qualified personnel (postgraduate studies, doctoral studies), research and development, innovation, international activities.

Supporting processes include: personnel management, resource management (management of infrastructure, educational and industrial environment), quality management system management and environmental management (Petropavlovskaya V.B., 2022), publishing, library and information services, information environment management, procurement management, life safety, social support for students and staff.

The most important in understanding the process approach to management is the concept of «business process». Identification of business processes is the most difficult, since the staff focuses on the performance of certain functions, the achievement of goals and objectives (Mikheeva E.Z., 2008). It is the orientation of universities to business processes that makes it possible to gain competitive advantages in the educational market (Kuzmina S.N., 2012).

In the TQM methodology, a «process» is any activity presented in the form of a process, revealed in the relationship of the main components: outputs, inputs, resources (Nem Zh. A., 2012).

There are several reasons for the growing interest in the process approach in management:

1) is one of the eight basic principles of the QMS;
2) allows you to reduce the functional constraints between the structural divisions of the enterprise by establishing horizontal links between processes;
3) ensures the continuity of management at the junction of individual processes within their system, as well as in combination and interaction;
4) increases the responsibility of the employee of the enterprise involved in the process by expanding the powers delegated to employees with a

simultaneous increase in requirements for the quality of labor results;

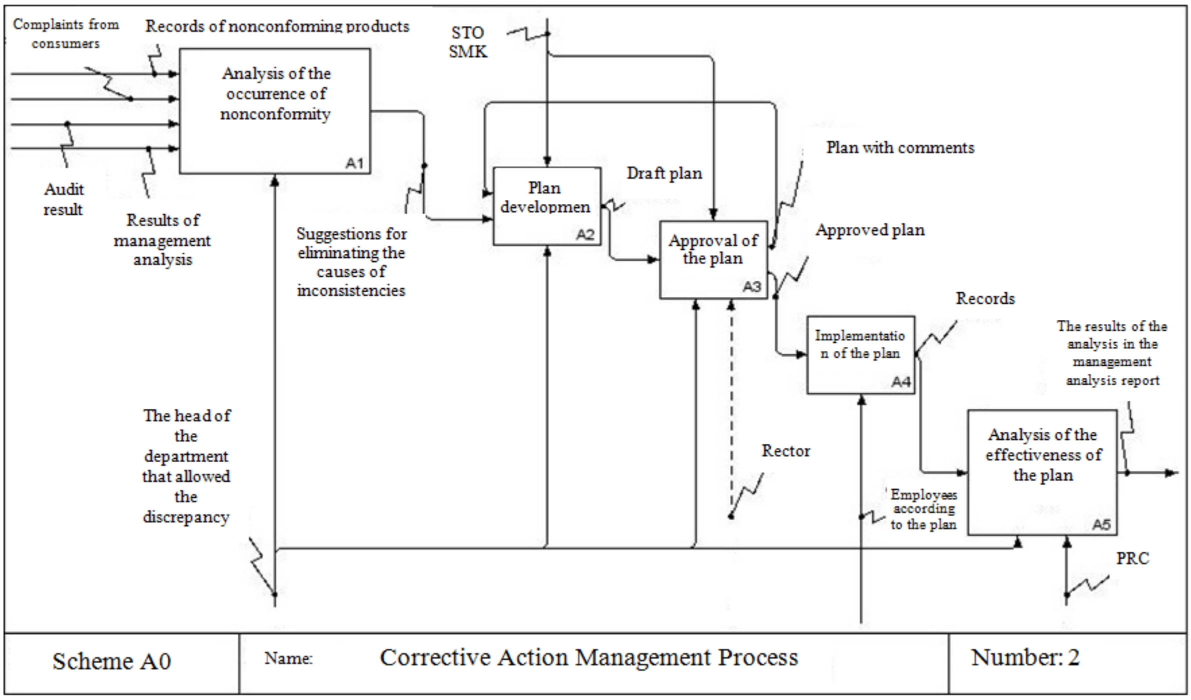

Figure 1: Corrective action management process.

5) ensures the «transparency» of the presentation of the enterprise's activities (Polovinchuk D.Yu., 2014).

The key principles of the process approach at the university are:

- result orientation (intermediate results are evaluated and a comprehensive assessment is carried out at the final stage);
- improvement of human capital, its competencies that meet the needs of the market;
- productive interaction of participants by harmonizing interests;
- efficient use of resources (Shevchenko T.A., 2013).

The identification of processes in the activities of the university is accompanied by their documentation. It is carried out in the form of process maps. They reflect the main activities of the university (Fig. 1 and Fig. 2).

International and national standards do not contain specific requirements for the content and design of maps. Therefore, the university independently determined: the content of the maps and the procedure for their development, implementation and management.

The applied form of cards is one of the most common forms at the moment. Maps consist of a main document and three appendices. They include sections: approvals and approvals, general information (the process manager and process purpose are indicated), process outputs and their consumers, external suppliers and process inputs, types of activities within the process, management and required resources.

Applications as part of the information card:

mandatory Annex A «Process planning» (process indicators, their measured values, actual and target values, methods (methods) of measurement and analysis);

recommended Annex B «Measures to improve the process» (factors influencing the change in indicators, measures aimed at changing the values of influencing factors, the timing of the implementation of measures, responsible persons, additional resources / performers);

recommended Appendix B «Corrective and preventive actions» (identification and characterization of nonconformity, search for the cause of nonconformity, corrective and preventive actions, correction (elimination) of nonconformity, verification of the effectiveness of corrective actions) (Kuzmina S.N., 2012, Nem Zh. A., 2012).

When developing the «Research and Development» process map, the purpose of the process was determined by a whole list: obtaining new knowledge, finding solutions to applied problems and putting developments into practice, increasing the level of staff training, etc.

The head of the process is the Vice-Rector for Research and Innovation. The outputs of the process are documents (scientific reports, patents, monographs, textbooks, teaching aids, methodological developments, etc.), technologies, samples, projects, etc. The range of consumers is wide: scientific and pedagogical workers, students, institutes, departments, external organizations, etc. Scientific and innovative activities are implemented in TvSTU according to the TQM methodology - in the form of an ordered set of works and operations, with the regulation of entry and exit and the availability of documented procedures for their implementation (Kuzmina S.N., 2022).

The requirements for the process determine the social and economic orders of the state, as well as contracts and technical specifications of specific customers. The inputs of the process are contracts, plans, tasks, on the one hand, human and material resources, on the other. Each input has a provider process or department and documentation that specifies the requirements for the inputs.

Activities can be divided into three groups, indicating external and internal regulatory documentation: research work in general, research work carried out by the teaching staff in accordance with an individual plan, research work of students.

Process planning is carried out on the basis of accreditation indicators. It is aimed at achieving the following goals: to ensure the range and volume of fundamental, applied scientific research and development, including research work of students, the efficiency and effectiveness of activities in the main scientific areas, the demand for research work by external organizations (consumers) for ongoing research projects. directions. The focus of scientific work is described in the development strategy of the university. It is consistent with the basic principles of ESG (Environmental, Social, Governance principles) and sustainable development (Kuzmina S.N., 2020).

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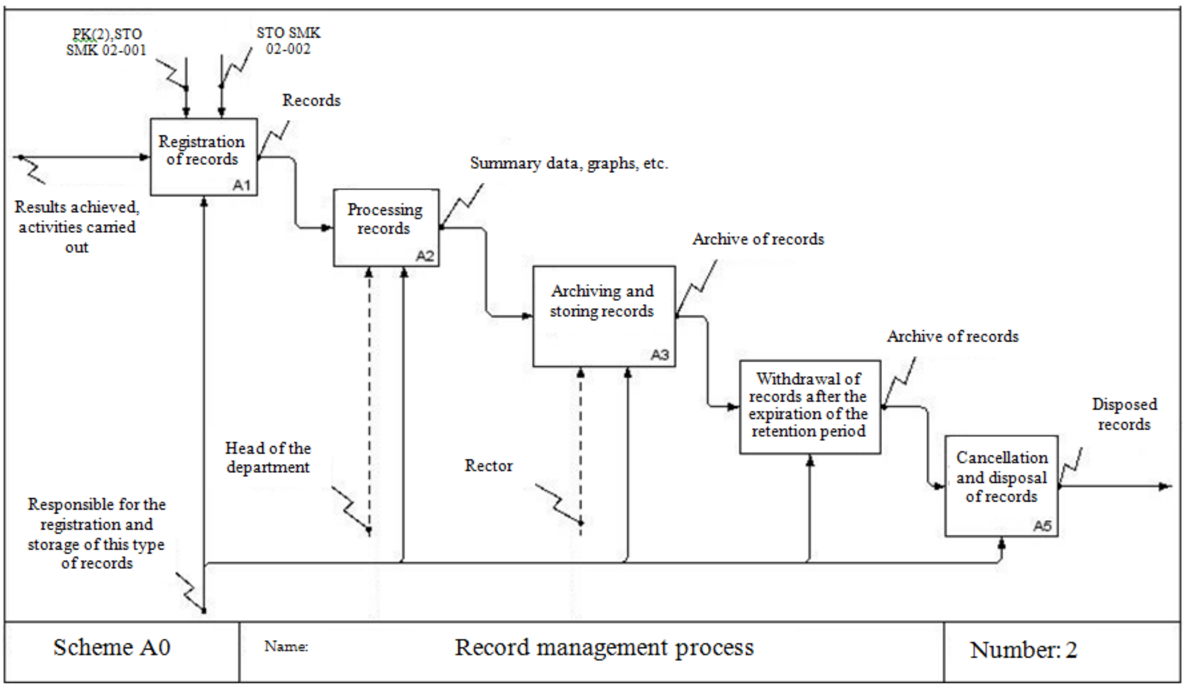

Figure 2: Records management process.

Process improvement activities are always directed towards process objectives. The main influencing factors are human and material resources, the brand of the university, marketing, level of organization, etc., for each factor, measures should be formulated indicating the responsible person and deadlines.

The order of development, approval, circulation and management of process maps, as well as other documentation, as a rule, is established by the documented procedure «Documentation Management». Process maps are an independent document and are used by the department to which they belong. On the basis of maps, if necessary, standards, regulations, regulations containing more detailed information can be developed.

Documentation of processes in accordance with international standards provides a complete and visual description of the responsibilities of process executors and their interaction.

2 CONCLUSIONS

Thus, process management can improve work efficiency and strengthen competitive advantages. But it should be noted that one approach to management does not exclude the other, and with a complex organizational structure, approaches can be combined; with a functional approach, you can use dedicated business processes [6]. At the same time, when developing options for growth, management must take into account that in modern conditions it is research and development activities, as well as innovation, that are key business processes. It is they who today determine the leading positions of the university.

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