

# Problems of Application of Information and Communication Systems in the Organization of Personnel Work in Higher Educational Institutions

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## ABSTRACT

The presented article is devoted to the problems of the use of information and communication systems in organizing the work of personnel in a higher educational institution. The main task of information and communication systems is to automate the key processes taking place in the university, with the aim of effectively servicing the main activities of this organization. Currently used information and communication systems allow solving only certain problems, since there is no integrated system that would include work with all the processes occurring in the university. The staff of a higher educational institution is interested in optimizing all internal organizational processes, and for this it is necessary to develop information and communication systems that will reduce the time to perform routine operations. The paper presents data from an empirical study conducted among scientific and pedagogical workers, administrative and managerial personnel, and educational and auxiliary personnel of a higher educational institution, in order to identify problems in the organization of their work. The results of the analysis allowed us to suggest ways to eliminate the problem areas of the use of information and communication systems in a university.

**Keywords:** *information, information and communication systems, university staff, higher education institution, process, process approach*

## 1. INTRODUCTION

Currently, the amount of information that higher education institutions encounter in carrying out management activities is increasing. The quality of management directly depends on the extent to which the university is able to extract the maximum from the available information. To fulfill this requirement, it is necessary to build an effective information and communication system that will allow people to quickly respond to the current situation and make a high-quality management decision.

The main sources of information for the leadership of higher educational institutions are information and communication systems, the task of which is to automate the key processes of the university. But, most of the existing information and communication technologies make it possible to solve individual problems, because there is no integrated system that would include work with all processes occurring in a higher educational institution [1, 2, 3]. For example, each university uses systems for electronic document management, for working with personnel and students, for the organization of the educational process, etc. And each of them works independently, and for large organizations such as universities, where the constant interaction of all structural divisions is carried out, it is necessary to integrate the automated systems used so that university staff do not

have to look for information in the "bowels" of automated "storages" and resort to the help of specialists with access to them.

The information and communication system of a higher educational institution "should provide various opportunities for obtaining information resources, conducting various monitoring in any areas of activity, analyzing the results of work within the units for all management levels and business processes, i.e. to provide effective informational and analytical support for all types of activities implemented by the university" [4].

The increasing complexity of organizational systems and their functioning processes has led to the need for organizational isolation of information and core activities. This prompted the formation of information and communication systems as independent structures. These systems are designed to collect, store, process and disseminate information. The purpose of their functioning is the information service of the main activity of the organizational system. The role of information in management, which has now become a strategic resource, has grown significantly. This puts forward new requirements for its analysis, which is a prerequisite for the effective implementation of all processes taking place in higher educational institutions. One of these processes is the organization of work of university staff.

Personnel is the core of any organization, including higher education, and the degree of its involvement in the activities of the university determines the effectiveness of the management of this institution [5].

It should be noted that the introduction of a unified information and communication system of the university should be aimed at improving the organization of staff work, which will allow "to increase labor productivity by reducing the time to perform routine operations" [6].

## 2. METHODOLOGY OF THE STUDY

The methodological basis of the study is presented by scientific works of domestic and foreign scientists. In particular, the issues of applying system analysis and a systematic approach to the study of an organization were considered in the works of Ya.I. Kuzminova [7], F.M. Morse [9], S.P. Nikanorova [8], T. Parsons [10], D.S. Semenova [7], I.D. Frumina [7], S. Young [11]; problems concerning the management of the university were considered in scientific research by V.V., Andronaty [12], V.P. Babintseva [13], V.M. Zakharova [14], M.G. Kovyazina [12], S.A. Company [14], M.V. Lugovskoy [14], I.E. Nadutkina [14, 15], L.B. Perelyginoy [12], N.S. Rozova [16], M.V. Selyukova [14], Ya.I. Serkina [15], V. B. Tarabaeva [17], N.P. Shalyginoy [14]; the use of information and communication systems in management was considered in the works of I.V. Boyarinova [21], S.A. Ivashchenok [20], L.V. Kolpina [21], I.E. Nadutkina [20], M.I. Nesterova [4], A.V. Ostroukh [18], A.V. Raichenko [19], E.V. Reutov [21], M.N. Reutova [21], N.E. Surkova [18], V. B. Tarabaeva [20]; the features of the organization of work of the university staff are considered in the works of T.E. Volsky [6], N.A. Novokreshchenova [5], L.A. Fedoskina [5].

The study was based on systemic and process approaches. The main provisions of the systematic approach allow us to fully reveal the integrity of the management process in higher educational institutions, and to reveal the diversity of types of intraorganizational ties. The application of the process approach allows us to consider information flows and their movement within the system, as well as to identify the disadvantages of the use of information and communication systems that negatively affect the management of the university.

During the study, general scientific methods were used: description, analysis, comparison, generalization. The paper presents empirical data collected through a questionnaire, interviewing experts, and the method of photographing the working day was also applied.

## 3. RESEARCH RESULTS

Improving the management system in a higher educational institution requires "reliable information about the main aspects of the employees' work, and the staff gets the opportunity to convey to the management the opinion of the

work collective on the conditions of their work and the actions that should be performed to increase its effectiveness. Ensuring such interaction implies a systematic nature of the study of staff opinions, that is, it should be carried out as part of a staff satisfaction assessment system" [5].

In order to identify the main problems of the use of information and communication systems in organizing the work of personnel in a higher educational institution, in 2019 (April to November), we conducted an intelligence (production) study. The technique of this type of research is presented in the work of V.I. Dobrenkova and A.I. Kravchenko [22]. The collection of empirical data was carried out on the basis of the Belgorod State National Research University (hereinafter - the University) of the Federal State Autonomous Educational Institution of Higher Education.

1. The results of processing the obtained data by applying the method of self-photography of the working day.

When conducting self-photography of working hours (carried out by the employees themselves without using external monitoring), we used the method of photographing working hours.

The table "Self-photography of working time costs" was developed by type of work for 1 week, and we invited university staff to fill out this Table, taking into account that the working day lasts 8 hours. In total, 20 people were interviewed from among the administrative and managerial personnel (the level is the educational unit of the University), educational and auxiliary personnel, and scientific and pedagogical workers.

At the next stage, the job descriptions of the study participants were studied. The analysis of this type of document allowed us to choose those functional responsibilities that are associated with the analysis of information. At the next stage, 10 types of work were identified that were included in the survey sheet.

Types of jobs:

1) *Preparation of the workplace* (turning on (turning off) the PC, setting tasks for the working day, etc.). All interviewees take an average of 15 minutes to prepare a workplace.

2) *Work with correspondence* (viewing documents and letters on paper; viewing electronic messages and letters; preparing prompt answers that do not require a long analysis and searching for information). It takes 10 to 60 minutes to work with correspondence. (30 minutes on average). At the same time, this work takes 60 minutes for the teaching and auxiliary personnel, and only 20 minutes for the administrative and managerial personnel.

3) *Work with organizational and legal documents* (development, search for previously approved documents: provisions; instructions; regulations). Work with this group of documents takes an average of 60 minutes. At the same time, teaching and support staff spends up to 30 minutes of working hours, and administrative staff up to 60 min.

4) *Work with administrative and reference documents* (familiarization with orders and instructions for the University, preparation of draft orders and orders relating to issues of the structure, analysis of reports received for

registration of memos and statements, preparation of memos sent to management (or other structures). Interviewees noted that they have to work with these documents: from 30 to 60 minutes. - administrative and management personnel - from 60 to 240 minutes. - educational support staff (up to 50% of the working time). 5) *Telephone conversations* (incoming and outgoing calls). Phone calls take up to 60 minutes of working time for management personnel and about 120 minutes of the teaching support staff. At the same time, the specialists of the educational and organizational department noted that in certain periods they spend 30% of the working time on telephone alerts of teachers, curators, students, parents.

6) *Analytical activity* (preparation of information and analytical reports, plans, roadmaps, inquiry letters, response letters, etc.). Analytical activity takes from 20 to 60 minutes of working time for the majority of respondents, but it is worth noting that the curator and teacher encounter this work 1-2 times a month.

7) *Participation in the work of collegial bodies* (meetings, planning meetings, etc.). All respondents have to participate in meetings, depending on the sequence of events. Administrative staff takes part almost daily and takes 20 to 60 minutes to do this per day, but the rest participate from 1 to 3 times a week.

8) *Work in information and communication systems*. Work in information and communication systems is carried out by the methodologist, department head and deputy director daily. It takes 50-60% of their working time. The rest of the respondents noted that they took an average of 60 minutes to do such work in a day.

9) *Reception of visitors* (heads of structural divisions, representatives of other organizations, teachers, students, parents, etc.). Reception of visitors is carried out daily and throughout the working day.

10) *Unplanned work* (work that occurs by chance, requiring urgent implementation). On average, all respondents spend about 120 minutes on unplanned work in a day.

So, the analysis of the results of self-photography of working time showed that up to 50% of the working time is spent on working with documents, while unplanned work takes 25% of the working time, and in most cases, it is also associated with the preparation of documents.

The document flow of higher educational institutions has its own specifics, namely a large number of paper documents accompanying educational, scientific and managerial activities. They are formed in various structural divisions both in manual form and using information systems. "The following methods of storing and processing documents are currently widespread in universities: printing and storing in paper form, storing in personal folders, storing on network shared resources, and also in information systems" [23]. All this only complicates the work of searching for information and its systematization and reduces the effectiveness of the managerial decision.

2. Interviews with experts. The interview was conducted among representatives of administrative and managerial staff, teaching support staff and scientific and pedagogical

workers with 5 to 15 years of experience in these types of activities (N = 20).

Currently, universities are developing and adopting regulatory legal acts (in the form of regulations, rules, procedures) that allow regulating individual management processes and requirements for decision-making. But, so far, not all processes are regulated by this type of document. Consequently, it is difficult to understand in which case and on what issue, and most importantly, by whom the decision will be made and with what structures it is necessary to carry out the approval procedure. As part of the interview, we tried to identify the problems of organizing the work of the university staff, in particular, what difficulties scientific and pedagogical workers, administrative and managerial staff and teaching and auxiliary personnel encounter when processing documents.

To the first question "what is the procedure for approval of the memorandum before the issuance of the administrative document?" the answers were distributed as follows: 70% of the respondents noted that after registering the memorandum in the electronic document management system, they personally take the document to the structural units from which a mark of approval is required, and after the issuing of the administrative document they personally take a copy of it; 20% of respondents said that in accordance with the established rules for organizing workflow, they transmit the document to the department of document support of the office and expect that a copy of the administrative document will be received by e-mail; 10% of respondents said that it all depends on the circumstances.

Answers to the question "Do you find it difficult to search for legal and administrative documents on the official website of the University?" the distribution of answers revealed the following: 50% of respondents answered that they were more likely to cause difficulties; the second half of the respondents answered that they didn't most likely cause it — they were 40% of the respondents, and clearly 10% of the respondents did not cause difficulties.

90% of the experts to the question "Do you think that the rules of documentary support of management at the University are not clear enough and are not clearly regulated?" answered "rather yes than no" and only 10% - found it difficult to answer.

To the question "Do you have to develop, coordinate, sign documents (or comply with the standards, requirements set forth in documents) that are not able to eliminate the existing problem, but are needed in order to avoid conflict situations in the future?" the answers were distributed as follows: 30% answered unequivocally "yes"; 60% answered "rather yes than no"; 10% found it difficult to answer.

Thus, the results of the interview showed that the university staff is rather not satisfied with the organization of work with information and communication systems, since they do not cover all the processes taking place at the University. Therefore, the time for routine operations is not reduced, which reduces the efficiency of the university staff and the speed of managerial decision-making.

#### 4. DISCUSSION OF RESULTS

During the study, problems were identified regarding the use of information and communication systems, in particular: there is no regulation and optimization of existing processes (in this case, paperwork); there is no diagram of the route of movement of information flows (it is necessary to clarify that we are talking about documentation); the automated system is not fully used to optimize the development, decision-making and preparation of the necessary documents for standard situations (i.e. not requiring an approval procedure, if there is a regulation with a clear description of a specific process or procedure within a specific process).

We agree that the information and communication system of a higher educational institution should meet the following tasks:

- provide managers of all levels of university management with the necessary data posted in information and communication systems [4];
- to give staff "effective tools for automating the analysis of sets of indicators in all areas of the university" [4];
- provide conditions for increasing the efficiency of information exchange, ensuring the accuracy of the data entered and stored in the information and communication system [1, 2].

Thus, we offer the following solutions to the problems identified:

#### 5. CONCLUSIONS

Improving the information and communication systems that are used in universities should be carried out taking into account the need to merge all the automated systems existing in the organization into a single whole, which will optimize the search for the necessary information for operational decision-making and thereby increase the effectiveness of university management.

At present, the organization of the work of personnel in a higher educational institution is not optimal. This is due to a number of problems: lack of regulation of all processes occurring in the university; there is no transparent scheme of the route of movement of information flows; the automated system is not fully used to optimize the development, decision-making and preparation of the necessary documents for standard situations.

To eliminate these problems it is necessary: to conduct an examination of legal documents with a view to systematizing and placing them in the information and communication system; to develop and place in the information and communication system an algorithm for the movement of documents, which should be associated with the regulations for each process or process procedure; automate work on all routine operations where a large number of approvals and analysis of additional information are not required.

The implementation of the above measures will optimize the work of the staff of a higher educational institution, as well as increase the effectiveness of university management through the use of an integrated information and

1. The problem of the lack of regulation and optimization of existing processes can be solved by conducting an examination of all existing legal documents in order to systematize them, eliminate duplicate functions and then place them in the information and communication system.

2. The problem of the lack of a route for the movement of documents can be solved by developing a clear algorithm for the movement of documents from the moment of their creation to the moment of decision-making and bringing decisions to the performers. This algorithm should be placed in the information and communication system, and it must be associated with the regulations for each process or process procedure.

3. The problem of the incomplete use of the information and communication system to optimize the development, make individual (standard) decisions and prepare the necessary documents can be solved by automating work on all routine operations where a large amount of coordination and analysis of additional information is not required.

The application of the process approach will reduce the number of levels of managerial decision-making and increase the effectiveness of management at the university. All activities of the organization should be divided into processes and each process should be regulated, while the regulation should describe not only the process itself, but also the interaction between structural units for its implementation.

communication system to reduce the time spent on certain types of work.

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