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Article

Features of Document Circulation Processes in Higher Education Institutions

Matkarimova Sevinchkhon Shavkat qizi*[1]

1. Tashkent State University of Economics, "Information systems and technologies in economics" direction PhD doctoral student

* Correspondence: sevinchxonmatkarimova@gmail.com

Abstract: This article analyzes the organizational and specific aspects of document circulation processes in higher education institutions, existing problems and ways to improve them. The main goal of this study is to identify the shortcomings of existing (used) traditional document circulation systems, assess their impact on efficiency, and develop ways to improve them based on modern information and communication technologies. In particular, the differences between traditional and electronic document circulation systems, their effectiveness and impact on management processes are considered. The article substantiates the fact that the process of working with documents in the higher education system is multi-stage and multi-subject, in which such stages as the creation, review, approval, execution and archiving of documents are carried out in an interconnected manner. The main problems of the traditional paper-based document circulation system are also analyzed, including increased time consumption, dependence on the human factor, disorganization of information flows and insufficient functioning of control mechanisms. The research demonstrates that it is possible to increase management efficiency by automating document flow in the higher education system.

Keywords: EHAT (electronic document management system), document management, electronic document system, higher education, automation, management efficiency, information and communication technologies.

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1. Introduction

In the current context of globalization and digital transformation, improving management processes in higher education institutions is one of the important strategic tasks. The effectiveness of the education system directly depends not only on the quality of the educational process, but also on how effectively the management mechanisms are organized. One of the main components of these management processes is the document management system [1].

The document circulation process in higher education institutions is a complex and multi-level system, which includes such stages as the creation, processing, storage, transmission and control of various documents [2]. Professors, deans, departments, departments and administrative bodies actively participate in these processes. Therefore, the effective functioning of the document circulation system ensures the continuity of the entire institution.

Practice shows that in many higher education institutions, the traditional, that is, paper-based document circulation system still forms the main workflow. This causes a number of problems, including:

- slowness of document processing;
- excessive time and labor;

- errors due to dependence on the human factor;
- the risk of loss or improper storage of documents;
- insufficiently correct and accurate functioning of control and monitoring mechanisms [3].

The rapid development of modern information and communication technologies creates new opportunities to eliminate these problems. In particular, the introduction of electronic document management systems (EDMS) allows automation of the processes of creating, approving, transmitting and storing documents. This, in turn, helps to increase management efficiency, accelerate decision-making, and rational use of resources [4].

In recent years, the digitalization of the higher education system has become one of the priority areas of state policy [5]. In this process, modernization of document management systems, their integration into unified information systems, and ensuring transparency and efficiency at all levels of management are of great importance.

At the same time, document management processes in higher education institutions have their own characteristics that differ from those in other organizations. In particular, here:

- educational, scientific and administrative documents are maintained simultaneously;
- the volume and type of documents are very diverse;
- many participants participate in the processes;
- the control and reporting system has a complex structure.

These factors make optimizing the document management system an even more pressing issue [6].

The purpose of this article is to scientifically analyze the characteristics of document circulation processes in higher educational institutions, identify existing problems and develop proposals for their improvement based on modern information technologies.

The research objectives are:

study the theoretical foundations of the document circulation system in higher educational institutions;

identify and analyze problems in the current system;

assess the capabilities of electronic document circulation systems;

develop scientific and practical recommendations for automating document circulation processes [7].

2. Research Methodology

The study was based on a systematic approach. According to this approach, the document flow process was considered as a single system consisting of interrelated elements. These elements include:

- document types (work in higher education;
- process stages;
- participants (users);
- information flows;
- technological tools.

The processes were also analyzed based on a functional and process approach, which allowed for a separate and systematic consideration of each stage of document circulation.

The research used analytical, comparative and systematic approaches to justify the advantages of electronic document circulation systems. In particular, the possibilities of

document digitization, automatic processing, electronic signature confirmation and real-time monitoring were recognized as important factors in increasing management efficiency.

The article also proposes a conceptual approach aimed at automating the processes of forming and managing personal work plans of professors and teachers in higher education institutions. This approach shows the possibilities of optimizing document circulation processes, reducing unnecessary bureaucratic stages and increasing the speed of decision-making.

The results of the study show that digitizing the document circulation system in higher education institutions and using integrated platforms Organization based on it serves to improve the quality of management, the effective use of resources and the overall effectiveness of the educational process. This study is based on the following methods:

Analytical method - study of existing document circulation systems in higher educational institutions; Document circulation systems used in practice in higher educational institutions were studied. Regulatory and legal documents, internal regulations and existing information systems were analyzed.

Comparison method - comparison of traditional and electronic systems; Traditional (paper) and electronic document management systems were compared based on the following criteria:

- speed;
- reliability;
- security;
- level of control;
- resource consumption.

Systematic approach – consideration of document workflow processes as a complex system; Document workflow processes were analyzed at the input, processing and output stages. Problems and efficiency levels at each stage were identified.

Modeling – development of a model for optimizing document workflow processes. A conceptual model was developed to optimize document workflow processes. This model consists of the following components:

user interface (UI);

database (DB);

document management module;

control and monitoring module.

Expert evaluation method The shortcomings and needs of the existing system were identified based on the opinions of specialists (professors, dean's office staff, IT specialists) working in higher education institutions. The study used regulatory legal documents, scientific articles, and practical experience.

3. Results

During the research process, a comprehensive analysis of the current state of the document management system in higher education institutions was conducted, its main features, problems and opportunities for improvement were identified. The results obtained were systematized in the following main areas [8].

Structural model of the current document circulation process

As a result of the analysis, it was determined that the document circulation process in higher education institutions consists of the following main stages:

Document creation (input stage) - a document is prepared by a professor or employees, the document is submitted to the department or department in its initial form.

Review and agreement - the document is checked by responsible person, corrections are made if necessary.

Approval - approved by the management (dean, vice-rector, rector), often a signature is required in paper form [9].

Direction for execution - sent to the relevant departments, executed by executors.

Control and monitoring - the term and quality of execution are controlled.

Archiving - documents are transferred to the archive for storage.

The main feature of this process is that it is multi-stage and repetitive.

Main problems in the document circulation system

The study identified the following problems:

1. Excessive bureaucracy of the process - documents go through several unnecessary stages, the decision-making process slows down.

2. Loss of time - there is a need to manually carry paper documents, searching and finding documents takes a lot of time.

3. Dependence on the human factor - there is a high probability of errors, documents can be incorrectly executed.

4. Disorganization of information flow - documents are maintained in different formats, there is no single standard.

5. Weakness of control mechanisms - there is no real-time monitoring of the execution of documents, deadline violations are frequent [10].

The results of the study show that document circulation processes in higher education institutions have the following characteristics:

Multi-stage structure Documents usually go through several stages:

- preparation
- review
- approval
- execution
- archiving

Multi-stakeholder participation Various stakeholders participate in the process:

- faculty
- dean's office
- rector's office
- departments and services

Dependence on paper documents Many institutions still rely on traditional (paper) documents, which leads to:

- time loss
- increased errors
- risk of document loss.

Complexity of information flow Documents move between many departments, which complicates the process.

Insufficient standardization Some processes are not organized according to a single standard [11].

4. Discussion

The results obtained show that the traditional document management system cannot fully meet modern requirements [12]. Therefore, the following proposals are put forward:

Implementation of an electronic document management system

- maintaining documents in digital form;
- approval by electronic signature;
- automatic control systems.

Automation of processes

For example: automatic formation of personal work plans of professors and teachers, automatic routing of documents.

Creating an integrated platform

- unifying all departments into a single system;
- real-time monitoring.

Training employees on the use of new systems

This provides the following results:

- time is saved;
- the human factor is reduced;
- management efficiency is increased [13].

An Econometric Approach to Reducing Paper Consumption

One of the most immediately visible economic results of digitizing document management in higher education institutions is the reduction in paper consumption [14]. Typical retail prices for 500 sheets of A4 office paper on the Uzbek market are approximately 64,000 sums, 73,000 sums, and 75,000 sums; based on these prices, the average price of 1 box (500 sheets) is 70,666.7 sums, and the average cost of 1 sheet is 141.3 sums.

Econometric Model

The following regression model can be used to estimate paper consumption:

$$Q_t = \beta_0 + \beta_1 D_t + \beta_2 X_t + \beta_3 S_t + \beta_4 E_t + \varepsilon_n$$

Here:

Q_t — Paper consumption in period t (in sheets),

D_t — number of official documents,

X_t — number of employees and professors,

S_t — the number of students or the volume of documents related to serving them,

E_t — the level of implementation of the electronic document management system,

ε_n — random factors.

The economic interpretation of this model is that as the number of documents, the number of employees and the volume of services to students increase, paper consumption increases, and as the share of the electronic system increases, paper consumption decreases [15].

Simplified practical model

If you want to show practical calculations in the article, rather than complex regressions, the following model is very convenient: Q = N * H * P

Here:

N — number of document preparation staff,

H — the average volume of documents prepared per employee per month (in sheets),

P— number of periods (months).

After digitization:

$$Q' = Q * (1-r)$$

Here r is the paper consumption reduction coefficient.

Economic savings on paper:

$T = (Q - Q') * C$

Here C is the price of 1 sheet of paper.

Sample calculation

Let's assume that a higher education institution has 600 professors, teachers and staff who regularly work with documents. Each employee prepares an average of 25 sheets of various work plans, reports, notifications, assignments and other official documents per month. Then the annual paper consumption is:

There will be Q = 600 * 25 * 12 = 180 000 sheets [16].

If an electronic document management platform is implemented and the volume of paper documents is reduced by 70%, then the new annual cost:

So, the amount of paper saved is: Q' = 180 000 * 0.3 = 54 000

ΔQ = 180 000 – 54 000 = 126 000 sheets

Or makes up: 126 000 / 500 = 252 boxes.

Assuming that the average cost of 1 box of paper is 70,666.7 sums (the price of paper was taken based on the price of quality paper on the Uzummarket platform), the annual economic savings from the paper itself alone:

It will be – 252 * 70 666.7 = 17 808 000 sum

Enhanced economic efficiency

In practice, the cost of paper is not limited to the sheets themselves. Physical document management also includes folder, file, storage, copying, printer resource, and archiving costs. For example, in some markets, an A4 document file is offered for 500 sums, and a button-type document folder is offered for around 10,900 sums. Thus, when electronic document management is introduced, not only paper costs are reduced, but also the ancillary costs associated with storing and organizing documents. Therefore, the overall savings in the article can be expressed as follows:

$$TS = T_q + T_p + T_m + T_a$$

Here:

- T_q — money saved from paper,
- T_p — savings on folders, files, and storage media,
- T_a — savings on archiving costs,
- T_m — Economic efficiency due to labor and time savings [17].

Table 1. Comparative analysis of paper consumption and costs before and after digitization.

No.	Indicator	Before digitization	After digitization	Difference
1	Annual paper consumption (sheets)	180 000	54 000	126 000
2	Number of paper boxes (500 sheets)	360	108	252
3	Average price for 1 box	70 666,7 sum	70 666,7 sum	—
4	Annual paper costs	25 440 012 sum	7 632 004 sum	17 808 000 sum

5. Conclusion

Document management processes in higher education institutions are a complex and multi-stage system, and their effective management is important. Taking into account that documents are the main factors that form the main business processes in higher education, proposals were made on the need to properly organize measures to increase efficiency (rational use of resources). The results of the study show that by automating these processes and transferring them to electronic systems, it will be possible to significantly increase management efficiency.

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