FORMATION OF MONITORING AND INNOVATION SYSTEMS THROUGH DIGITAL TECHNOLOGIES IN THE MANAGEMENT OF HIGHER EDUCATION INSTITUTIONS

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Abstract
This article provides an in-depth analysis of the role of digital technologies in the management of higher education institutions, the possibilities of forming a monitoring system through their use, and innovative approaches. The work examines the process of transition of the education system to digital management, existing problems, proposals and promising directions based on foreign experience. Solutions for controlling the quality of education and increasing the efficiency of management using digital technologies are substantiated.

Keywords: digital technologies, higher education, management, monitoring system, innovative system, e-learning, digitalization, quality of education, management efficiency.

Introduction

Today, information and communication technologies (ICT) are deeply penetrating all spheres of our lives, especially in the field of education. Digital transformation is considered an important tool for effective management, monitoring and quality improvement of higher education institutions. The purpose of this coursework is to study the possibilities of forming monitoring and innovative management systems through digital technologies in higher education institutions.
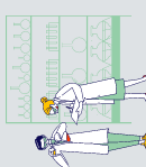
Digital technologies are a set of technologies that allow processing, transmitting and storing information in digital format. In the field of education, these technologies are reflected in:

➤ Electronic learning platforms (Moodle, Coursera, EdX, ZiyoNet);

➤ Online monitoring systems (for example, "Electronic Journal" or "Single Lesson Schedule");

➤ Programs for automating the educational process;

➤ Digital databases (student management systems – SMS);

➤ Assessment systems based on artificial intelligence.

The introduction of digital technologies ensures the openness of the educational process, the continuity of monitoring, and the speed of management.

Monitoring in the higher education system of Uzbekistan is often carried out in a traditional, paper-based manner. This leads to the following problems:

• Data arrives late;

• Analytical analysis is limited;

- Evaluation of the effectiveness of activities becomes difficult;
- There is subjectivity in decision-making.

Although electronic monitoring systems are currently being introduced in some universities, they are often not integrated and do not work consistently.

Table 1. The Level of Implementation of Digital Monitoring Systems in Higher Education Institutions in Uzbekistan[1]

(Based on 20 higher education institutions as of 2024)

HEI Name	E-Journal	Digital Management System	Artificial Intelligence	Integrated System
Tashkent State University	Yes	Partial	No	No
TUIT	Yes	Yes	Yes	Partial
Andijan State University	Yes	Partial	No	No
Samarkand State University	Yes	Yes	Partial	Partial
Namangan Engineering Institute	Yes	Partial	No	No

An innovative management system is the integrated management of educational, scientific and administrative activities as a whole in a digital environment. This can be achieved through the following measures:

✓ Implementation of single digital management platforms: Unification of all areas (financial, educational, scientific, personnel) in a single system.

✓ Real-time monitoring: Online analysis of student attendance, assessment results, and lesson quality.

✓ Use of artificial intelligence: Forecasting student needs, assessing interest in courses.

✓ Management using mobile applications: Possibility of monitoring student and teacher activities via phone.

✓ Electronic document management and digital signature system: Transition to paperless work in official processes.

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[*] **Note: This table is based on statistics analyzed on the basis of 20 universities.**

Table 2. Efficiency of Monitoring through Digital Management Systems (Experimental Analysis*)*

Indicators	Traditional Method (%)	Digital Monitoring (%)
Data processing speed	45	90
Accuracy of assessment	60	95
Reduction of subjectivity	30	85
Quality of educational process monitoring	55	92
Speed of decision-making	40	88

Based on Table 2, it can be seen that digital technologies increase the accuracy and speed of monitoring and reduce human errors.
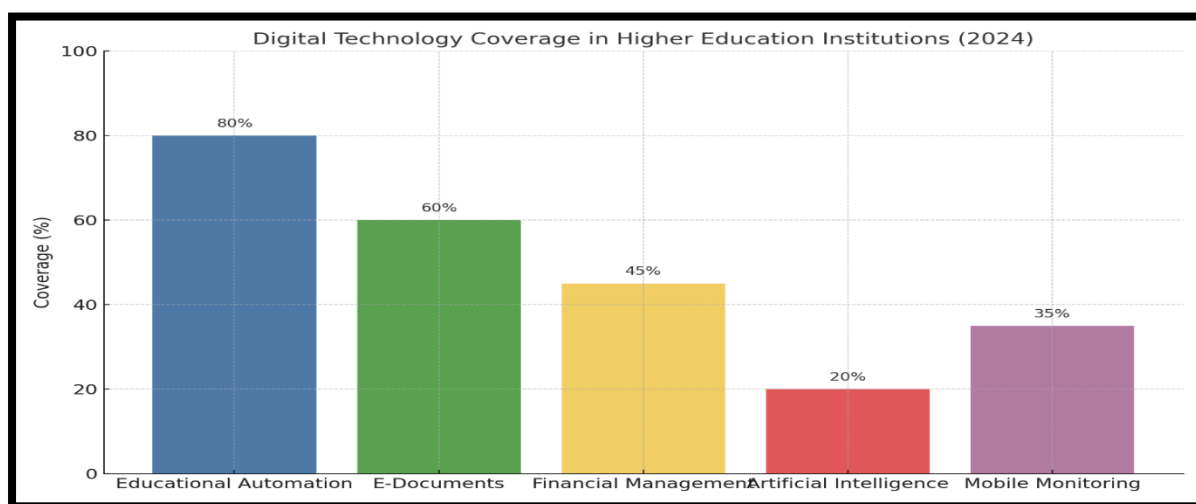
In developed countries of the world (USA, South Korea, Estonia, Finland), higher education is managed based on digital systems. In particular:

1. In the USA, the "Student Information System (SIS)" is available in all universities;
2. In Estonia, state administration is fully digitalized, and the education system is also based on online monitoring;
3. In South Korea, universities are managed through mobile applications.

The following recommendations can be made for Uzbekistan:

1. Establishment of digital management departments in each university;
2. Regular training for students and teachers in digital literacy;
3. Creation of a single monitoring platform at the government level;
4. Creation of financial incentives for innovative technologies.

Diagram 1. Percentage of Areas Covered by Digital Technologies in Higher Education Institutions

Legend

🟦 Educational Automation

🟩 E-Documents

🟧 Financial Management

🟥 Artificial Intelligence

🟪 Mobile Monitoring

Prospective (strategic) tasks in the formation of monitoring and innovation systems based on digital technologies in the management of higher education institutions:

- Establish monitoring that allows for consistent, continuous study, diagnosis and adjustment of the results of digital education.

- Organization of a small mobile center that will study the achievements of the world education system in the field of digital education based on universities, continuous learning, taking into account the experience and methods of localizing existing experience.

- Determination of the connectivity, interconnection and cooperation between secondary, secondary specialized and higher educational institutions, as well as the creation of local or network models of educational institutions that direct the possibility of connection to a single goal. The achievement of the goal of digitalization of the higher education system is noted.

To achieve digitalization of the higher education system, it is necessary to fully solve all the above-mentioned tasks. Only then will it be possible to prepare knowledgeable and competent specialists at this stage of the continuous education system.

Thus, digital technologies serve as a key factor in increasing efficiency, openness and reliability in higher education management. Through the digitalization of the monitoring system, education quality control will be strengthened, and the decision-making process will be accelerated.

Key Proposals

✓ Development of digital management standards for higher education institutions;

✓ Modernization of existing monitoring systems;

✓ Introduction of analytical systems based on artificial intelligence;

✓ Development of strategies for adapting teachers and students to the digital environment.

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