

Application of digital tools in the management of universities in Kazakhstan

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Abstract

The development of competition in the international educational space intensifies the role of transformation of the higher education system. In the context of modern realities, educational institutions have to compete for students with new participants of the digital education market. Numerous studies point out that digital technologies bring the potential for successful implementation of education: the introduction of artificial intelligence (AI), interactive platforms in the academic process that allow for more effective learning of theory and practical skills. For the successful digital transformation of higher education, it is important to revise traditional management methods in order to implement the principles of educational management. In accordance with the Concept of Development of Higher Education and Science in the Republic of Kazakhstan until 2029 approved in 2023, Kazakhstani universities should move to the model of “smart universities” with a digital ecosystem in accordance with the world's successful practice of digitalization. The article considers the application of digital tools in the educational management of higher education institutions in Kazakhstan. This study attempts to assess the implementation of the tasks specified in the Concept of Development of Higher Education and Science of Kazakhstan.

Keywords

digital tools, higher education, university, digital campus, educational management.

Introduction

For the development of the higher education system of Kazakhstan it is necessary to realize the digital transformation of universities, paying special attention to the key elements that contribute to increasing its competitiveness. In this context, the main emphasis is placed on evolutionary development and continuous analysis in accordance with global standards and best practices (Akinfiyeva, 2022).

The use of digital tools in education is not only necessary to facilitate the labor of teachers and improve student performance, but also to manage the activities of higher education institutions (Shaugarayeva, 2020; Shindina, 2023; Khudyakova, 2023). To date, the efforts of supervising departments of the Republic of Kazakhstan create conditions for the activation of digital transformation of the higher education system. In this regard, it is relevant in methodological and practical terms to consider the tools and mechanisms of digital transformation of higher education institutions in Kazakhstan.

Materials and methods of research

Scientific publications of scientists of Kazakhstan and other countries of leaders in the digitalization of higher education served as a methodological base. Official data presented on the official websites of the Eurasian National University, Satpayev University, as well as normative legal acts of the Republic of Kazakhstan regulating the implementation of state policy in the system of higher education were analyzed (Ministry of Science and Higher Education of the Republic of Kazakhstan, 2024; L.N. Gumilev Eurasian National University, 2024; Kazakh National Technical University named after Kanysh Satpayev, 2024; D. Serikbayev East Kazakhstan Technical University, 2024; The concept of development of higher education and science in the Republic of Kazakhstan for 2023-2029, 2023; National Development Plan of the Republic of Kazakhstan until 2029, 2024; The development program of the L.N. Gumilyov Eurasian National University, 2022; The development program of the Non-profit Joint-stock company «D. Serikbayev East Kazakhstan Technical University», 2020). The study uses theoretical methods – abstraction, analysis, concretization, generalization; empirical methods – study and generalization of universities' experience in the development and application of digital tools.

Results and discussion

In 2023, the Concept of development of higher education and science in the Republic of Kazakhstan for 2023-2029 was approved (The concept of development of higher education and science in the Republic of Kazakhstan for 2023-2029, 2023). In the context of higher education transformation, the approved concept requires the provision of training opportunities in higher education institutions, taking into account the proactive formation of the country's personnel composition and subsequent employment of graduates, the formation of digital systems in the education system (fig. 1).

Concept of development of higher education and science in the Republic of Kazakhstan for 2023-2029

Development of higher education infrastructure and digital architecture

Enhancing the digital competences of citizens

Modernization of scientific infrastructure and digitalization

Development of applied science and ecosystem for commercialization of the results of scientific and scientific-technical activity

Figure 1. Directions for the development of digitalization of higher education in the Republic of Kazakhstan

The concept emphasizes the development of the digital system of higher education. Let us consider the basic components of the digital architecture being formed:

- it is planned that the system of higher education institutions will include a set of infrastructural elements, software and applications for application in the learning process, management of educational resources and university activities, as well as interaction between students and faculty;
- creation of digital campuses in the concept is considered as one of the key factors in the formation of a digital ecosystem of higher education institutions in Kazakhstan. Digital campuses are based on online platforms with access to various educational and organizational resources: class schedules, educational materials, library collections, interactive courses and others;
- digital modernization of libraries, connection to the educational platforms Open University and Coursera, digitalization of business processes of educational activity management become an important task

accepted for implementation. Digital competencies of students will be emphasized as a mandatory element in educational standards.

In accordance with the above-mentioned Concept, the system of higher education and science should undergo a transformation process taking into account the presented digital components in order to increase competitiveness and ability to meet modern requirements. Emphasize that the main task of digital transformation of universities is to improve current methods of management of the higher education system in Kazakhstan through constant analysis and application of experience of international universities with positive experience.

The main provisions of the higher education policy until 2029 presented in the Concept are aimed at improving the regulatory and legal framework, ensuring the autonomy of universities, attracting talented specialists to the scientific sphere, improving the quality of education through the implementation of modern educational programs focused on the economy of the future taking into account global trends. Elements of digital technologies are gradually planned to be introduced into pedagogical design to respond to modern challenges in higher education. It is necessary to create centers of academic excellence on the basis of leading universities, creating modern teaching and research laboratories, which will be an important factor for training personnel for their participation in the high-tech economy and stimulating the commercialization of scientific developments.

Digitalization of internal document flow between the structural units of the leading research universities of Kazakhstan began in 2022. The process is implemented using the Directum QAZ electronic document management system, this system has already effectively demonstrated itself in the work (fig. 2). In order to effectively manage documentation, the agreed materials in electronic form in the electronic document management system are equal to handwritten agreement on paper.

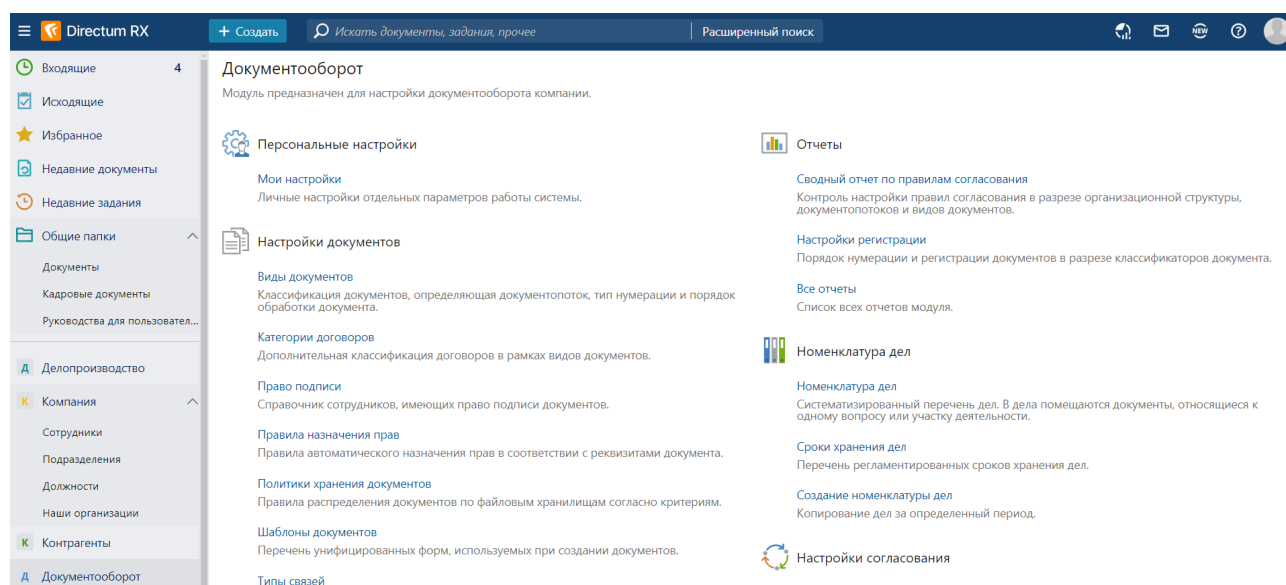


Figure 2. Interface of the electronic document management system (L.N. Gumilev Eurasian National University? 2024)

Directum QAZ the leader among the leading universities in Kazakhstan is L.N. Gumilev Eurasian National University, a research university that strives to improve the quality of educational services and increase research potential. L.N. Gumilev Eurasian National University is a research university that strives to improve the quality of educational services and increase research potential. Smart.enu is a large system, consisting of a website and a mobile application. Its peculiarity is that all data are entered only once and displayed on all systems at once.

In 2024, IT specialists of this leading national university integrated the university information system smart.enu with the Egov Mobile application (fig. 3). Now, on the smart.enu platform, university faculty, students and staff can sign about ten types of documents by scanning a QR code.

This measure is aimed at developing our own ecosystem and simplifying processes. The capabilities not only save time and budget spent on printing documents, but also benefit our environment. Automation has

simplified and accelerated production processes. In the first 5 months of 2023, 3,100 contracts and 5,000 silabuses were signed through the smart.enu system.

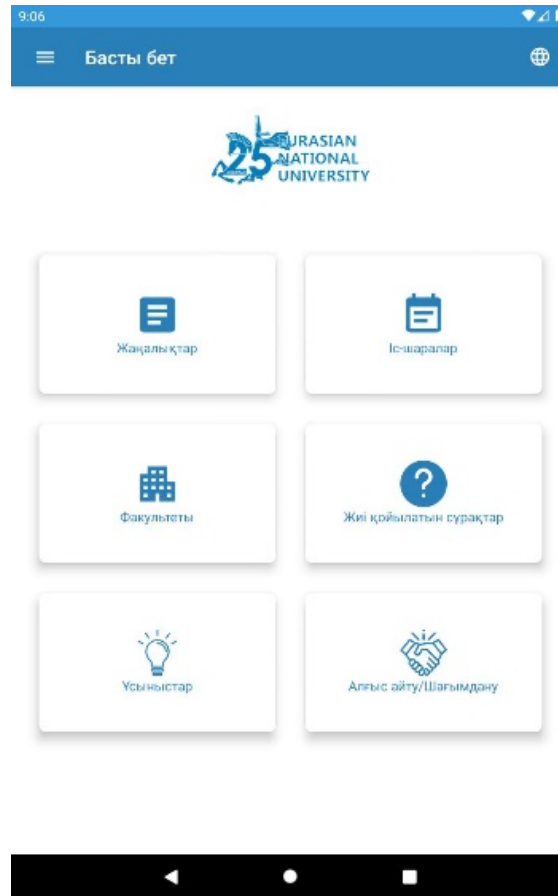


Figure 3. Application interface SMART.ENU (L.N. Gumilev Eurasian National University, 2024)

Taking into account the high rate of development of digitalization of higher education in the Republic of Kazakhstan, integration of all electronic systems of universities into the Unified System of Higher and Postgraduate Education, the position of digital officer in the person of a member of the Board – Vice-Rector for Digitalization and Infrastructure is introduced in national universities.

The development of the «smart university» concept implies the need for qualified IT-specialists, the need for prompt coordination of management decisions related to the digitalization of the university in all areas of its functioning. It is necessary at the initial stage to build management business processes in order to implement them in the digital university. In 2023, a large pilot project – a digital university – was launched. We decided to take two universities: one of national level Satbayev University (Kazakh National Technical University named after Kanysh Satpayev., 2024), the second – regional East Kazakhstan Technical University named after D. Serikbayev (D. Serikbayev East Kazakhstan Technical University, 2024).

The development of the digital university model is primarily aimed at the transformation of management and educational processes and management systems in higher education institutions using digital tools. The main goal of transformation is to improve the quality of higher education.

Satbayev University has developed a model of a digital university, which implies the creation of a solid foundation for digitalization, namely:

1. transformation of the business process management system, introduction of key performance indicators, which will form the basis for the functioning of the digital educational platform;
2. training of employees in cross-sectoral digital skills, taking into account their professional activities.



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The model of the digital university

Data-driven management systems;
Digital educational technologies;
Individual educational trajectories;
Digital Economy Competencies.

Figure 4. Structure of the digital university – Satpayev University

The structure of a digital university consists of four main areas presented in figure 4:

1. Data-driven management systems designed to analyze information about students, teachers and the learning process to make management decisions.
2. Digital educational technologies – mandatory use of online platforms, virtual laboratories and other tools to improve the quality of learning.
3. Individualized educational trajectories where students choose their learning track based on their interests and needs.
4. Digital economy competencies are important for future specialists capable of working in the modern labor market, where digital technologies play a key role.

The concept of «Digital University» is implemented through the introduction of modern digital technologies and applications in the educational process, the use of online educational platforms, offering students and teachers new opportunities and formats of interaction (fig. 5).

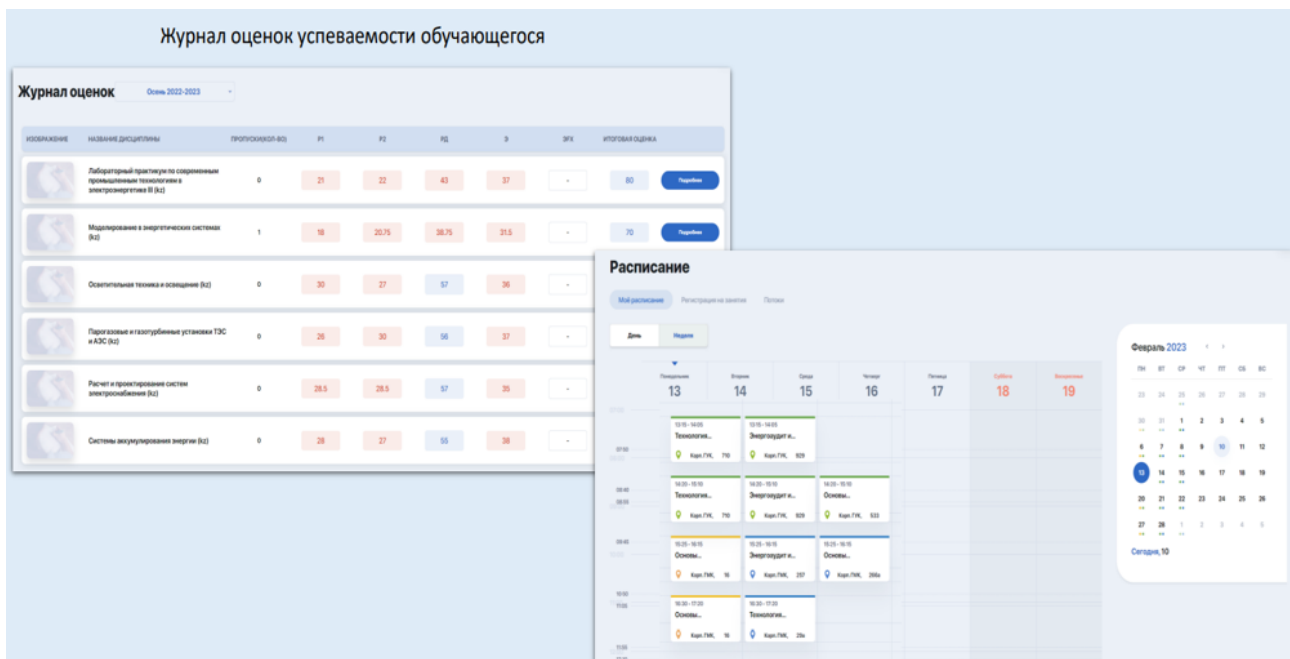


Figure 5. Pilot project of Satpayev University (Kazakh National Technical University named after Kanysh Satpayev)

To form a digital campus, the following steps are planned: introduce an online platform, place all resources on it, supplement the platform with such management tools as a class schedule, library resources, and others. Let us consider the process of digital transformation of the higher education system. In 2024, 15 universities in Kazakhstan started to implement Google courses on artificial intelligence, 12,000 students participate in the Generative AI project. Two universities are participating in the Google for Education pilot project. In order to develop cooperation and application of innovative learning technologies, negotiations were held and Memorandums were signed with such large companies as Coursera, «Huawei Technologies Kazakhstan» LLP, Binance Kazakhstan. Huawei ICT Academy was established on the basis of 35 universities, where certified courses from Huawei are provided. Thanks to the support of Binance Kazakhstan, about 350 teachers of ICT faculties from 22 universities have been trained in blockchain technologies. To date, about 102 Coursera courses have been translated into Kazakh and Russian. In 2024, 40,000 licenses have been allocated to students from 93 universities. The digital ecosystem in universities is also strengthening: all universities are connected to LMS platforms (Platonus, Univer, Moodle, etc.). Digital transformation is not just about automation, but about finding new and efficient ways of working, adopting a new culture and worldview, not just IT skills. Transition to easier processes and mechanisms to manage the whole chain of university business processes. The main task of the considered digital tools used in the universities of Kazakhstan is to create a unified information space for digital interaction within the university.

Conclusion

At the moment, Kazakhstan is actively implementing measures on digitalization of the higher education system. Particular attention is paid to improving the efficiency of higher education institutions. These transformations are aimed at bringing the country to a leading position in the global educational space.

All considered technological solutions are aimed at digitalization of scientific and educational process, automation of business processes. The creation of digital universities is one of the tools that are used to develop the overall digital architecture of higher education institutions.

Considering the prospects for the development of digital transformation, it is assumed that there is a growing need for specialists in information technology and data analytics, as well as a flexible system of automation of management of higher education institutions.

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Применение цифровых инструментов в управлении высшими учебными заведениями Казахстана

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Аннотация

Развитие конкуренции в международном образовательном пространстве усиливается роль трансформации системы высшего образования. В условиях современных реалий учебные заведения вынуждены конкурировать за обучающихся с новыми участниками рынка цифрового образования. Во множестве исследований отмечается, что цифровые технологии несут потенциал для успешной реализации образования: внедрение искусственного интеллекта (ИИ), интерактивных платформ в учебный процесс которые позволяют более эффективно осваивать теорию и практические навыки. Для успешной цифровой трансформации высшего образования важно пересмотреть традиционные методы управления для внедрения принципов образовательного менеджмента. В соответствии с Концепцией развития высшего образования и науки в Республике Казахстан до 2029 года утвержденной в 2023 году, казахстанские университеты должны перейти к модели «smart-университетов» с цифровой экосистемой в соответствии мировой успешной практикой цифровизации. В статье рассмотрено применение

цифровых инструментов в образовательном менеджменте высших учебных заведений Казахстана. В данном исследовании произведена попытка оценки реализации задач, указанных в Концепции развития высшего образования и науки Казахстан.

Ключевые слова

Цифровые инструменты, высшее образование, университет, цифровой кампус, образовательный менеджмент.

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