Organization of the educational process based on smart technologies and improvement of the quality of education.

Jurayev Husniddin Oltinboyevich
(Bukhara State University. e-mail: h.o.juraev@buxdu.uz)
Khusenov Murodjon Zokhirovich
(Bukhara State University. e-mail: m.z.xusenov@buxdu.uz)
Tilavov Sherali Kudratilloyevich
(Bukhara State University. e-mail: akasherali@mail.ru**)**

Abstract: today in the world, special attention is paid to the development of information systems for the management of the educational process for the purpose of large-scale use of databases and communication networks in the field of education. In this area, thanks to the introduction of the e-government system in a number of countries, including the United Kingdom, the United States, South Korea, Denmark, Sweden, Iceland and Uzbekistan, the systematic implementation of reforms in the sphere of government, business, especially in the provision of various public services to citizens, is becoming important. This article describes the use of open source LMS for the introduction of distance learning, the organization of educational processes through systems and improving the quality of education.

Keywords: LMS, Distance learning, Smart, Moodle, CMS, University, higher education, LCMS

I. INTRODUCTION

Scientific research is conducted in the world aimed at the development of information systems for learning management, modeling, database design, as well as the development of algorithms. In this regard, one of the most important tasks is to create an information system for managing the educational process of a higher educational institution based on smart technologies (Social, Mobile, Access, Regulated, Technology), including models, algorithms, Entity-Relationship Diagrams (dad), formed on the basis of the Business Process model and notation (BPMN) methodology and relational algebra of business processes, as well as software (Social, Mobile, Access, Regulated, Technology) is considered.

In the new concept of education until 2030, adopted by international organizations and developed countries, “education is recognized as the main driving force of development and an important activity leading to the achievement of Sustainable Development Goals.” One of the important issues is the creation of business process models, the formation of the architecture of learning management systems (LMS), the creation of textual and physical data models in the form of ERD schemes based on the IDEF methodology, the development of diagrams of classes and objects in distributed information systems, as well as an information system for managing the learning process based on SMART technologies.

II. THE MAIN PART.

Nowadays it is difficult to imagine the daily activities of people without modern information technologies. A modern person has a need to study and work at a convenient time and place for him. The world's leading companies respond to trends in

education by introducing new technologies into the educational process. In foreign literature, we use the following abbreviations of educational process management systems [1], [2]:

-**LMS**-Learning management system (learning process management system);

-**CMS**-course management system (course management system);

-**LCMS**-Educational Content management System (educational content management system);

-**MLE**-Managed Learning Environment (Managed Learning Environment);

-**LSS**-Learning support system (learning process support system);

-**LP**-Learning Platform (learning process platform);

-**VLE**-virtual learning Environments (virtual learning environment).

The above-mentioned learning process management systems are the most common LMS and LCMS systems in the world. These training systems make it possible to take into account the needs of the student as much as possible.

The information systems used in the educational process can be classified as shown in Figure 1 [3].

LMS is software that provides an opportunity to A Higher Educational Institution – automation of training courses, a student – to undergo training courses by registering in the system, a teacher – to formulate the content of training courses and control student knowledge [4]. Through the LMS systems, it is possible to provide education not only to the state in which the higher education institution is located, but also to citizens of another state. The main characteristics of LMS systems are:

- individual implementation of training;
- control over the results of the educational process, the development and implementation of educational programs;
- provision of training courses on an individual basis in accordance with the development of the learner's knowledge [5].

These characteristics allow the university to effectively use the opportunities of traditional and e-learning. The world's leading LMS systems include Blackboard Learn, Moodle, desire2learn, Sakai, Angel Lab [6], [7], [8] Western countries were among the first to introduce LMS systems into the educational process. For this reason, we will analyze the LMS systems implemented in higher education institutions in the USA, Canada, Great Britain and Australia [9].

According to Edutechnica, the world's leading universities use the Blackboard Learn information system (40%). Through the Blackboard product, the company has raised $30 million worldwide. about the user gets an education. This company has developed the Blackboard Learn software product, as well as other types of applications for the educational process. Blackboard is a software for mobile phones of the blackboard Mobile platform that allows you to perform joint actions on the Internet through the blackboard collaborate platform [10].

Information systems Blackboard, Instruction, desire2learn, Moodle were introduced into the educational process. Universities with fewer students and insufficient funding use open source LMS systems similar to the Moodle system.

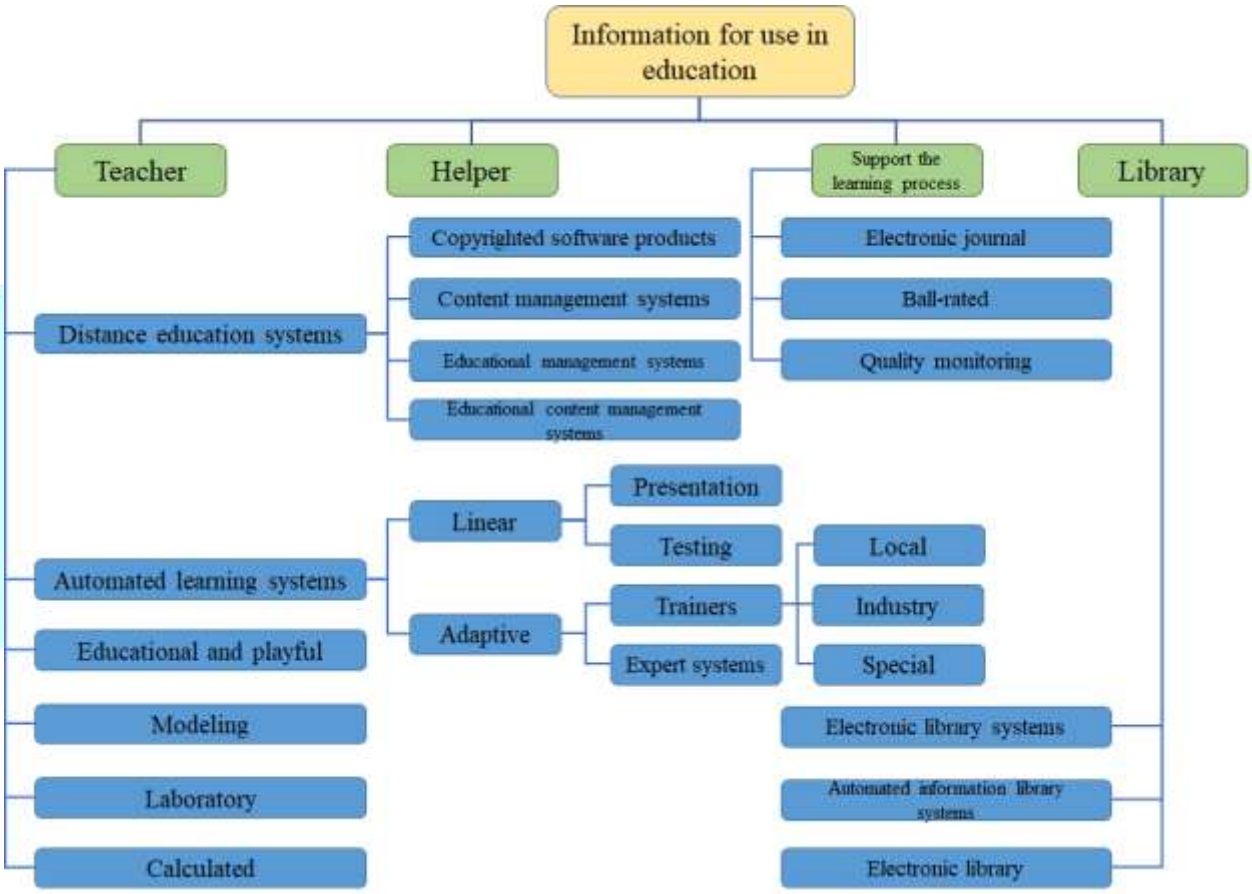

Figure 1. Information systems used in education

Information systems Blackboard, Instruction, desire2learn, Moodle were introduced into the educational process. Universities with fewer students and insufficient funding use open source LMS systems similar to the Moodle system.

Blended learning modern educational trends in the world are focused on the use of blended learning in universities. That is, training sessions in the educational process at the university are traditionally conducted remotely, along with classes in classrooms. Based on this approach, distance learning is used in the educational process, while preserving the achievements of traditional educational technologies.

Both educational technologies serve to eliminate their weaknesses by using them in the learning process.

Blended learning is an effective integration of various forms, models of learning, taking into account the specifics of students. Educational process management systems solve this issue.

The works of Coursera, Udacity, edX, Udemy can be cited as information systems containing open online courses.

Coursera is a platform that contains free online courses developed by the world's leading universities. 180 universities participate as partners in the project. The universities of Stanford, Pennsylvania, Princeton, London, Manchester also contributed to this project. Most of the training courses are in English and consist of a set of video tutorials. The learning process is free, and to obtain a certificate, you must pay a certain amount.

Udacity is a platform developed in collaboration with Google, AT&T, Facebook, Salesforce, Cloudera and consisting mainly of training courses in the field

of information technology. All training courses are created in English and are supported by subtitles in Chinese, Spanish, French and Portuguese.

edX-created in collaboration with Massachusetts and Harvard Universities. in the edX information system, along with monthly courses, classroom classes are possible.

Udemy is a platform that mainly includes paid training courses and is based on the use of mobile devices.

The Academic Earth website contains articles from the Massachusetts Institute of Technology (232 training courses and more than 1,000 lectures), Yale University (43 training courses and more than 1,000 lectures), Stanford University (161 training courses and more than 1,700 lectures), Harvard University (17 training courses and more than 195 lectures.

Training courses can be created and used through the **Blackboard coursesites** platform. The platform is designed specifically for university teachers. Unlike CourseSites, the Open Education platform is designed for HEI. At the beginning of 2022, the Open Education platform developed 998 free training courses designed for 24 universities.

III. DISCUSSION AND RESULTS.

Currently, the use of LMS systems in our country is somewhat behind the world's leading universities. In many of our local universities, business processes, mainly related to attendance, class schedules and scholarships, are automated, covering certain parts of the LMS functionality. Ensures the organization of a modern and effective educational process through the introduction of LMS systems in the universities of the republic.

When organizing the educational process on the basis of new modern technologies, improving the quality of education is achieved through the visibility of educational material, increasing the types of interactive communication between a student and a teacher, and constant monitoring of the educational process.

LMS systems expand the possibilities of tools for working with students:

- *use of chat, video conferences, webinars, virtual classrooms;*
- *provides discussions and collaboration on projects.*

In addition, through the LMS, direct communication between the student and the teacher can take place at any time. The presence of feedback from the teacher and the absence of reference to the time or place of contacting the teacher increase the effectiveness of learning. As a result, the constant access of students to high-quality educational services contributes to strengthening the reputation of the university [11].

From an economic point of view, the organization of the educational process through the LMS at the university is cheaper than in the traditional education system. The costs of organizing the educational process at the university can be seen from the results of a study conducted at Fordham University (in the USA, 10,000 et is spent per student per academic year):

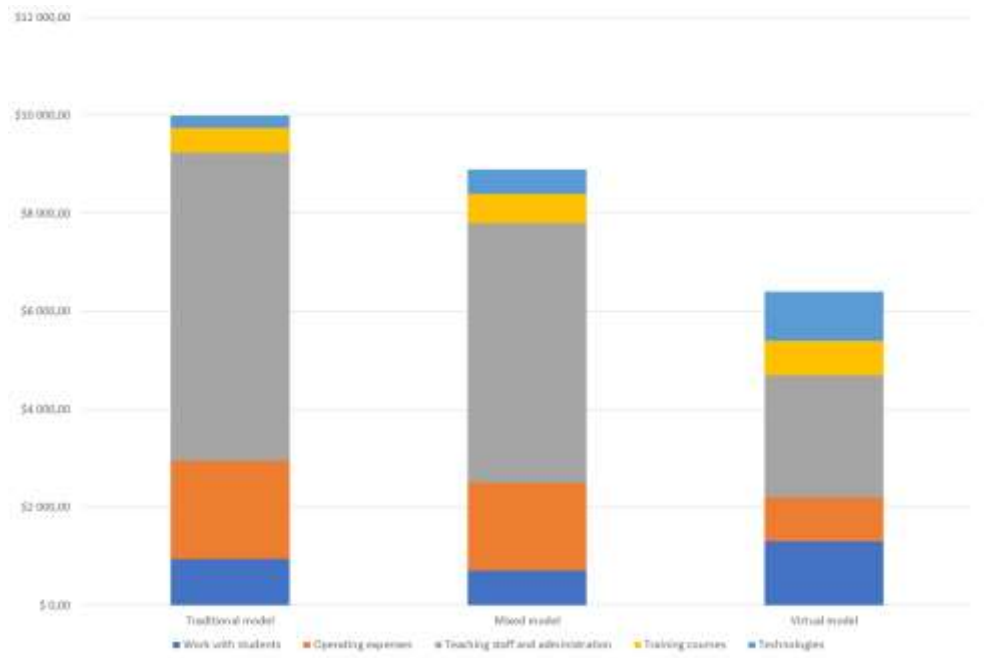

Figure 2. Cost per student

The conducted research shows that the savings in education costs at universities are achieved by reducing the costs of the audience and staff. But the organization of the educational process through a full-fledged e-learning system can lead to a decrease in the quality of education. Therefore, it is advisable to use LMS information systems that provide mixed learning technologies.

Decree of the President of the Republic of Uzbekistan No. PP-60 dated December 24, 2021 ”On additional measures to ensure the academic and organizational managerial independence of state higher education institutions" dated December 24, 2021- In accordance with December Resolution No. PP-61 “On measures to provide financial independence to state higher educational institutions” and Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 559 “on measures to introduce distance learning in higher educational institutions” dated October 3, 2022, Bukhara State University established distance learning.

In order to introduce distance learning, the foreign experience of choosing the necessary education system was studied. Several systems have been investigated by specialists. This:

- Ellie Learning portal
- TalentLMS
- Adobe Learning Manager
- iSpring Learn
- Eduflow
- Skillcast LMS
- SafeWorkday SafetyPoints SaaS+Content
- MasterStudy Education WordPress Theme
- 360Learning
- Gurukan

- Moodle

From these systems, the Moodle system was selected taking into account its convenience and openness and implemented at the university (link to the website https://masofaviy.buxdu.uz/). Currently, more than 8 orthotic courses have been created in this system, where more than 100 students study.

IV. REFERENCES.

1. В.А. Богомолов. Обзор бесплатных систем управления обучением. // Educational Technology & Society. 2007. № 10(3). с.439-459.

2. Ninoriya S., Chawan P.M., Meshram B.B. CMS, LMS and LCMS for eLearning. // International Journal of Computer Science Issues. 2011. V 8. Issue 2. p.644-647.

3. Черняева Э. П. Информационные технологии в образовательном процессе современного ВУЗа. // Научно-методический электронный журнал Концепт. 2016. Т.41. с. 225-230.

4. Хоружников С.Э., Зудилова Т.В., Ананченко И.В., Прыгун В.В. Облачные сервисы на современном этапе развития ИТ-технологий. // Дистанционное и виртуальное обучение. 2013. № 11. с. 77.

5. Mankad K.B. The role of multiple intelligence in E-Learning. // International Journal for Scientific Research & Development. 2015. V 3. Issue 05. p. 1076-1081.

6. Cavus N., Zabadi T. A comparison of open source Learning Management Systems. // Procedia-Social and Behavioral Sciences. 2014. № 143. p.521-526.

7. Mercy S., Aishwarya K., Christina Kathryn J., Divya B. A Survey on Learning Management System. // International Journal for Scientific Research & Development. 2017. V 5. Issue 2. p.2167-2170.

8. Hatakka, M. Modulaarisen järjestelmän laajentaminen – Moodlen kurssien arkistointilohko. Kotka: Kymenlaakson ammattikorkeakoulu. 2010.

9. В.А. Богомолов. Обзор бесплатных систем управления обучением. // Educational Technology & Society. 2007. № 10(3). с.439-459.

10. Hammami S., Mathkour H., Al-Mosallam E.A. «A multi-agent architecture for adaptive E-learning systems using a blackboard agent». // Computer Science and Information Technology, 2009, pp. 184-188.

11. Бойков Д.И., Васильев В.М. Интегрированные автоматизированные информационные системы вузов: вектор устойчивого развития. // Известия Российского государственного педагогического университета им. А. И. Герцена. 2012. № 153-2. с. 157-164.