

THE MODEL OF INFORMATION EDUCATIONAL ENVIRONMENT OF EDUCATIONAL ORGANIZATION ON THE BASIS OF THE 1C:ENTERPRISE SOFTWARE PLATFORM

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Abstract

The main approaches to the educational organization's information educational environment model construction and implementation on the basis of 1C:Enterprise software platform are considered, the arisen problems and ways of their elimination and also further plans for system's functionality expansion are considered.

The problem of forming the model of information educational environment of an educational organization is complex and is not limited only to the issues of automation; at the same time the existence of a uniform integrated information system is obligatory for decision-making on the basis of full, reliable and relevant information. The features of educational organizations and all education system of the Russian Federation are diversity, regional distinctions, individual specifics of each educational organization. These individual traits display themselves during the realization of various activities and cause the need for the educational organizations management problem solution on the basis of formation of the corresponding model of digital information educational environment.

Keywords: automation, information educational environment model, information systems implementation, educational activity, university, digitalization strategy, 1C:Enterprise software platform.

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Automation of the educational activity organization and management is a key task for the modern educational organization in order to achieve leadership in the educational market. The major limiting factors at the same time are limited resources e.g. temporary, financial, personnel, information [1].

The characteristics of the educational organizations (EO) and in general education systems of the Russian Federation are diversity, regional distinctions, individual specifics of each EO; these individual traits display themselves during the realization of various activities and cause the need for the educational organizations management problem solution on the basis of formation of the corresponding digital information educational environment model (IEEM) [2, 3].

Therefore, the management of federal state-funded educational institution of the higher education "Moscow State University of Technology "STANKIN"

(further — MSUT "STANKIN", the University) in 2014 made the decision of IEEM stage-by-stage creation. The 1C:Enterprise 8.3 software platform was chosen as the main basis for IEEM. MSUT "STANKIN" was established in 1930 as the Moscow machine-tool institute. Now the organizational structure of the university includes four institutes and one branch; it realizes different forms of education are according to the higher education programs. More than 500 teachers and researchers work at the university. The total number of students according to the main educational programs is more than 5000 people.

The structures of the university are located in Moscow and in the city of Yegoryevsk, Moscow region. The university has steady and constantly developing international relations with the universities and business partners of Austria, Brazil, Hungary, Germany, Italy, China, USA, South Korea and other countries in the spheres of its activity.

The main objectives of IEEM are:

- key business processes and activity types management in order to ensure competitiveness within the state policy on digital transformation, transition to digital economy and digital education;
- the integration of the effective applied software and hardware products complying to the federal (legal) and industrial requirements;
- the implementation of unified, technological and effective access means for information resources; the improvement of controllability of all complex of information resources.

At the moment the following IEEM elements exist in MSUT “STANKIN” and are partially interconnected among themselves [4, 5]:

1. The 1C:University information system is used for the educational activity processes automated management.
2. The 1C:Payroll and HR information system is used for the payroll calculation and human resources automated management.
3. The 1C:Accounting Suite information system is used for the accounting and financial operations automated management.
4. The 1C:Library information system is used for the scientific and technical library of the university automated management. It is partially integrated with the 1C:University OE management information system.
5. <http://www.stankin.ru> is the official site of MSUT “STANKIN” on the Internet.
6. <http://edu.stankin.ru/> is the digital educational environment (further — DEE); it uses the Russian Moodle software platform and is partially integrated with the 1C:University OE management information system.
7. <http://portal.stankin.ru/> — the EO intranet information portal, where the teachers’ private offices are located.
8. <https://lk.stankin.ru/> is digital assessments rating portal for students; it displays the results of various evaluations, exams and certifications for students.
9. The Sigur access control and management information system is used for security management e.g. access control and monitoring to the university buildings.

The EO information infrastructure has sufficient server capacities, an extensive uniform information and telecommunication network [6]. The main EO processes management structure and the general principles of its organization are similar to the regular practices of such activities accepted in Russian Federation and are implemented in compliance to federal regulations, letters and orders of the Ministry of science and the higher education of the Russian Federation and the local EO regulations [7].

Since 2014 MSUT “STANKIN” has been developing and implementing the IEEM kernel elements on the basis of the 1C:University software platform. The

first functional subsystem for the reception campaign management was launched in 2014 [8, 9]. Since 2015 the students staff management functional subsystem has been implemented; by now it is being constantly developed and modified according to the EO business processes. It is integrated with the digital educational environment regarding the synchronization of modules (disciplines), the students’ contingent and the students’ access management to modules (disciplines) in the DEE according to the curricula. The information transfer algorithm concerning the students’ contingent from the 1C:University information system to the DEE is realized. In 2016 the “achievements digest” functional subsystem was developed and implemented; it is capable of students’ assessment results and individual progress monitoring and management [10]. The functional capabilities of the 1C:University software appliance were modified and adapted in order to match the business processes’ requirements for higher education institutions regarding the students’ assessments and rating, progress accounting and intersession certification. In 2017 another 1C:University modification project was carried out; its main purpose was the staff individual achievements management and also hostel management. The integration with the Sigur access control and management system for intersystem data transfer was realized. In 2018 the project on introduction of the software product 1C:Document flow was implemented. According to the specified experience the information educational environment model of an educational organization on the basis of the 1C:Enterprise software platform presented in figure was created [11, 12].

Now the following needs of IEEM development are relevant:

- automated academic load management and schedule planning;
- automated of educational and methodical means development for curricula in general and specific modules;
- additional functionality and deeper integration of the implemented software products;
- unified information system buildup to cover all the EO management processes;
- automated research activity management.

The integration of the implemented information systems has to be expanded, especially the 1C:University software product, the DEE, the 1C:Library software appliance and the access control and management system in order to fulfill two-way automated data transmission.

According to the above the main strategic objectives, tasks and requirements to the model of information educational environment of an educational organization of the university were defined [13].

Main objectives of the the model of information educational environment of an educational organization development and improvement of its administration processes are carried as [14–16]:

- The development of new education forms and the improvement of educational services quality.

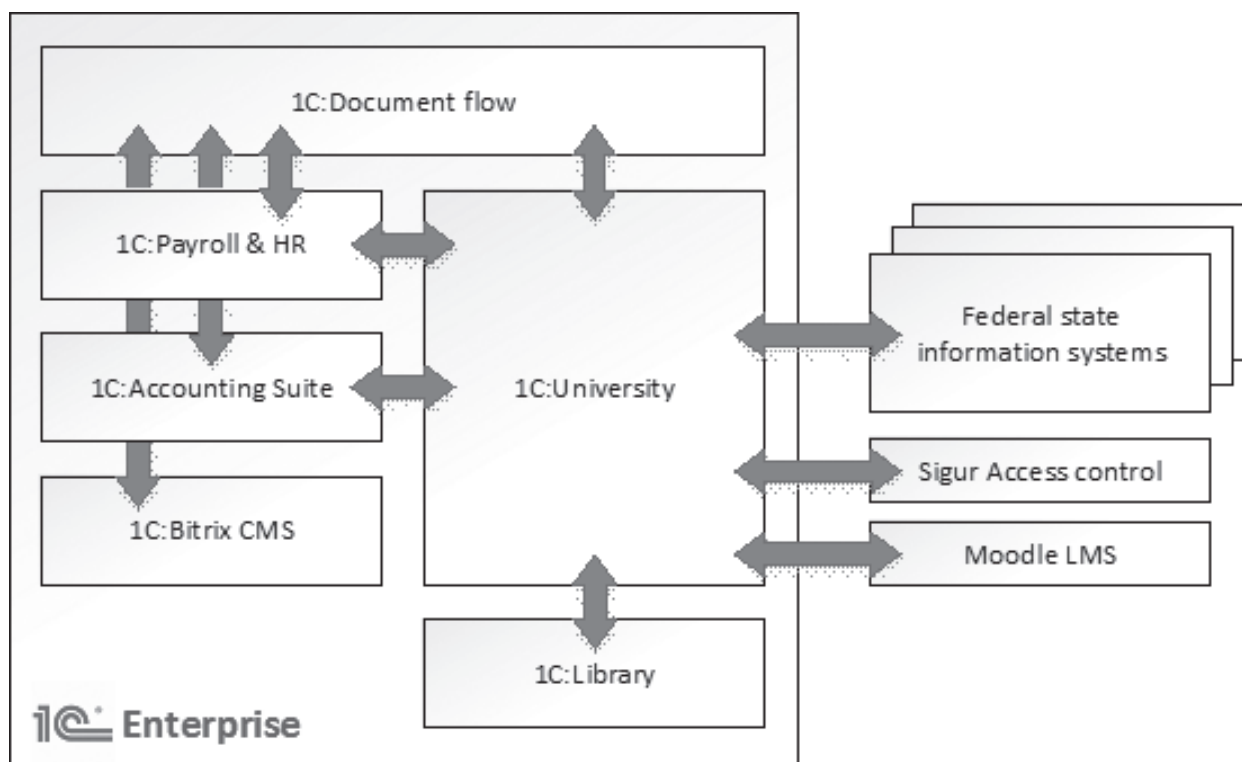


Fig. The model of information educational environment of an educational organization on the basis of the 1C:Enterprise software platform

- The efficiency upgrade of the educational activity management.
- The improvement of information services quality and their availability to users.
- The increase in return from information technologies used in the University management and ensuring educational process based on the business strategy coordination with the digitalization strategy and also by optimization of investment, organizational and technology solutions.
- The decrease of total IT resources ownership cost due to control improvement.
- The decrease of abuse opportunities for educational personnel abuses concerning students and for management personnel concerning teachers and workers based on computer assessment systems implementation, digital document flow, management decisions execution control and sensitive management and educational information access control.
- The cost efficiency upgrade of IT usage.

In order to achieve the above defined goals the following problems of the the model of information educational environment of an educational organization development and improvement of its administration processes have to be solved [17–19]:

- The development and implementation of advanced educational programs of various levels, including ones with participation of specialized departments within partner enterprises, according to educational and professional standards,

based on the opportunities of project and network education forms and individual educational trajectories design with use of digital and remote educational technologies.

- The implementation and development of special educational activity automated management information systems including automated assessment system, managements of the educational content management system, the integrated information resources of separate courses and the digital library resources, access to the Russian and international scientific databases, learning management system development, uniform digital curriculum standard implementation.
- The creation of a modern digital campus technological system, including the integrated information system of the University and the universal digital ID, various digital university services, corporate and educational portals.
- Providing the required software for educational activities according to inquiries of departments.

The following IEEM requirements are to be fulfilled in order to ensure quality of the objectives solution control[20–22]:

- “One window” access to the digital information education environment with uniform identification and authorization system for students, as well as digital portfolio aggregation.
- Modular course structure in the digital educational environment; students must be capable of fulfilling separate course modules and obtaining the corresponding certificates.

- Digital modular courses database has to be created in order to enable departments to construct basic and advanced curricula from these modular parts, thus developing e-learning and distant learning technologies.
- Wide implementation of digital online courses, including massive open online courses (MOOCs).
- Students' and teachers' personal data has to be stored within the 1C:University information system; educational tasks managers must be implemented therein.
- Quality digital courses have to be created or purchased and maintained in actual state.
- A digital video studio is required for digital video course production, including video lectures with different visualization methods in order to simplify course understanding for students and to keep their attention.
- A multifunctional office for students and teachers is required to enable the "one window" approach to any question or problem solution (references, debts, schedules etc.).
- Virtual other activities must be implemented e.g. webinars, lab activities, practices, remote consultations.
- Digital network collaboration with Russian and foreign universities is required.
- Traditional study activities must be carried out in an interactive form like polls, feedbacks, Q&A sessions etc.
- Adaptive training dialogues and gamification elements must support digital courses.
- Digital remote document submission to the selection committee and conducting remote entrance tests is required.
- The official Internet website must contain clear, useful and relevant information for students and other visitors.
- A universal digital ID card is required for all teachers and students.
- A mobile application for students and teachers is required.

A functional, efficient and reliable IT infrastructure is obligatory for the effective implementation of various projects including information systems and services (e.g. IEEM) development and implementation. Therefore, the digitalization strategy of the university states the main components of the IT infrastructure as well as the principles and an order of its construction.

The main components of the University IT infrastructure include the following:

- A data-center and data storage (including server hardware and backup system).
- An information and telecommunications system (including backbones, local area networks, cable circuits, e-mail servers etc.).
- External network perimeter defense (including firewalls, intrusion detection and protection systems, anti-bot, anti-spam etc.).
- A data loss protection (DLP) system.
- A website hosting subsystem.

- A digital phone system.
- A SIEM system.
- An internal corporate web portal integrated with the 1C:Document flow.
- Multimedia equipment.
- Sound-amplifying equipment.
- Video conference equipment.
- Personal computers and office hardware (multifunctional devices, printers, scanners, copiers etc.).

The following principles must be considered and fulfilled during the IT infrastructure buildup:

- The IT hardware systems must be reliable, fail-safe and functional; the software systems must be protected.
- The IT infrastructure must be flexible, scalable and adaptive to the external conditions according to the Strategic development program of MSUT "STANKIN" for 2018–2022 (general statements).
- It has to provide uninterrupted interaction with the federal state information systems (FIS GIA, FRDO, Contingent and others).
- It must enable remote access to regional and global data transmission networks.
- It must ensure optimal CAPEX and OPEX.

The IT infrastructure formation construction plan includes three stages:

Stage 1 — Design. The project documentation for software and hardware solutions is developed, taking into account all IT architecture elements of the University operating and the regulated methods of administration and data protection.

Stage 2 — Implementation & documentation. Hardware and software solutions are implemented; project documentation is developed and aggregated;

Stage 3 — Maintenance. Administration and technical support is carried out.

The development of the model of information educational environment of an educational organization is a difficult task, but its solution is obligatory for any educational organization [23]. The model offered above is based on the real experience of MSUT "STANKIN" and can be used as a basis to create of similar models taking into account the unique features of the automation objects.

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МОДЕЛЬ ЭЛЕКТРОННОЙ ИНФОРМАЦИОННО-ОБРАЗОВАТЕЛЬНОЙ СРЕДЫ ОБРАЗОВАТЕЛЬНОЙ ОРГАНИЗАЦИИ НА БАЗЕ ПЛАТФОРМЫ «1С:ПРЕДПРИЯТИЕ 8»

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Аннотация

В статье рассмотрены основные подходы к построению модели электронной информационно-образовательной среды на базе платформы «1С:Предприятие 8» и внедрению этой модели в образовательной организации, возникшие при этом проблемы и способы их устранения, а также дальнейшие планы по расширению функционала системы.

Проблема формирования модели электронной информационно-образовательной среды образовательной организации — комплексная и не ограничивается лишь вопросами автоматизации, при этом наличие единой интегрированной информационной системы является обязательным для принятия решений на основе полной, достоверной и актуальной информации. Характерными особенностями образовательных организаций и в целом системы образования Российской Федерации являются многоплановость, региональные различия, индивидуальная специфика каждой образовательной организации. Эти особенности проявляются в реализации различных направлений деятельности, что обуславливает необходимость решения проблем управления образовательными организациями на основе формирования соответствующей модели электронной информационно-образовательной среды.

Ключевые слова: автоматизация, электронная информационно-образовательная среда, интеграция информационных систем, образовательная деятельность, университет, стратегия информатизации, «1С:Предприятие».

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НОВОСТИ

На ММСО поддержали создание хартии о цифровой образовательной среде школы

На Московском международном салоне образования поддержали создание хартии о цифровой образовательной среде школы, сообщает пресс-служба компании «Яндекс».

«Существует потребность в единой цифровой среде школы. То что единая цифровая среда нужна — это безусловно. Современные цифровые форматы без этой инфраструктуры не могут развиваться», — прокомментировала создание хартии заместитель министра просвещения Российской Федерации И. П. Потехина.

Разработкой хартии занимаются Российская академия образования и компания «Яндекс». Хартия обозначит ориентиры в многообразии подходов к достижению образовательных целей с использованием цифровых инструментов. Она должна стать общественным договором между педагогами, родителями, чиновниками и образовательными ресурсами.

VI Московский международный салон образования проходил в Москве на ВДНХ с 10 по 13 апреля.

Это крупнейшее мероприятие в сфере образования в России и самая масштабная в стране выставка новых образовательных технологий, инфраструктурных и интеллектуальных решений объединила на одной площадке всех участников сферы образования: представителей профессионального и экспертного сообщества, государственных и общественных институтов и бизнес-структур.

Организаторами мероприятия выступили Министерство науки и высшего образования Российской Федерации и Министерство просвещения Российской Федерации. Салон проводится ежегодно в соответствии с распоряжением Правительства Российской Федерации. В работе салона приняли участие заместитель Председателя Правительства Российской Федерации Т. А. Голикова, министр науки и высшего образования Российской Федерации М. М. Котюков и министр просвещения Российской Федерации О. Ю. Васильева.

(По материалам федерального портала «Российское образование»)