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M. Pasyeka[1], I. Yurchak[2]
[1]Ivano-Frankivsk National Technical University of Oil and Gas,
[2]Lviv Polytechnic National University, CAD Department

DESIGNING THE CONCEPTUAL MODEL OF THE MANAGEMENT OF HIGHER EDUCATION THE BASIS OF INFORMATION AND INTERPERATING WEB TECHNOLOGIES

ПРОЕКТУВАННЯ КОНЦЕПТУАЛЬНОЇ МОДЕЛІ УПРАВЛІННЯ ВИЩИМ НАВЧАЛЬНИМ ЗАКЛАДОМ НА ОСНОВІ ІНФОРМАЦІЙНИХ ТА ІНТЕРПЕРАТИВНИХ WEB-ТЕХНОЛОГІЙ

This paper presents the design of a conceptual model to run higher educational institutions based on Web-technologies. The advantage of this proposed system model is the integration of regulations governing the educational process in schools (curriculum specialty, work program discipline, teacher load) with information on the subject. This creates a holistic view of the user of the learning process and provides a single point of access to all information related to the educational process. Thus, the development of problem-oriented management systems is a major university approach to structuring the system and the formalization of different data and knowledge in mathematical models. The technique (a combination of methods) that allows unifying structure and mathematical tools used to develop integrated models.

Key words: Information-analytical system of university, educational process, regulatory documents, web systems, information technology, automated management system.

Подано проектування концептуальної моделі управління вищим навчальним закладом на основі Web-технологій. Перевагою такої запропонованої моделі системи є інтеграція нормативних документів, що регламентують проведення навчального процесу у ВНЗ (навчальний план спеціальності, робоча програма дисципліни, навантаження викладача) з інформацією про дисципліни. Це формує цілісне уявлення користувача про навчальний процес та забезпечує єдину точку доступу до усієї інформації, пов'язаної з навчальним процесом. Таким чином, при розробці проблемно-орієнтованих систем управління ВНЗ головним є підхід до побудови структури системи і формалізації різнорідних даних та знань у математичних моделях. Запропоновано методику (сукупність методів), що дозволяє уніфікувати структуру і використовуваний математичний апарат для розробки інтегрованих моделей.

Ключові слова: Інформаційно-аналітична система університету, навчальний процес, нормативні документи, веб-система, інформаційні технології, автоматизована система управління.

Introduction

The application of information technology for teaching in higher educational institutions, causing widespread use of multimedia, interactive hypertext textbooks, databases and data banks, electronic libraries, and computer oriented test programs adaptive control knowledge evaluation.

The use of information technology in teaching enables to manage the learning process, and effectively administer the educational process. The main resource in the training is the use of information and telecommunications Web technologies, namely, dissemination of information, including publications; communication between teachers. Communication with students and between students themselves, the organization of information retrieval, interactive consulting, tasks for independent work, tests, video-conference; integrated system of organization and management of training process [1].

The need to develop modern and effective information-analytical system of management of higher education and the academic process, which combines the functions of an automated enterprise management system and the automated system of technological process control. Currently there is no single unified management of higher education institution. Information systems that are operated in the university, developed at different times, on different platforms and using different technologies, different in composition and qualification teams of developers. These systems are usually focused on the tasks of university management, i.e. are implementations of the automated control system of technological processes. The effectiveness of automated control system of technological processes is directly related to how well it provides the tasks of university management. Main functions and tasks of information-analytical system of the institution shall be a primary object of theoretical research and practical developments.

One of the main reasons for the use of automated learning systems based on information and interperating Web-technologies are changes in the demographic characteristics of students. Today, to higher education come from different age categories of students. They tend to receive higher education at more mature age, and on the basis of various forms of previous education, often on the basis of production experience.

An integral component of the learning process is a learning tool, providing interaction of the teacher with students.

The purpose of the use of such funds is to organize the efficient delivery of educational material, perception of educational information with the involvement of all information systems and channels: sight, hearing, touch, etc. Thus, modern technologies of training must be reinterpreted, adapted to the requirements of higher education. They need to be used both for teaching students and training teachers.

At the present stage the most effective for teaching systems and technologies that combine all these sources of information. It is shown that the effective use of information technology by the teacher largely depends on his level of training, quality of training material, the relevant technical, programmatic and methodological support.

The model of management of higher education

Modern information technologies are changing rapidly, this applies to both the technologies and their cost. Typically, in designing the automated system of technological process control universities should be used, examples of modern technology. In the conditions of modernization of education, the scientific community has developed a number of models describing certain aspects of the process of administration of the university and management process training with the help of computer systems. The variety of forms of training, a large number of specialties and specializations in higher education, a significant level of students competence requires management to educational institutions effective and efficient management methods when large volumes of information processing. To adequately make decisions at the appropriate level, you must use intelligent decision support integrated into the state system unified electronic database of education, because management management cannot effectively process the data streams that goes to him. Functional architecture model of management of the university are presented in fig. 1.

The technology of building models is the method of step by step detail and activation methods, school management and methods improvement of competences of students. Currently, under a system of decision support refers to the automated system, based on the interaction of the studied knowledge base in the subject area, methodological knowledge in specific academic disciplines [2].

The object of the study is the higher educational institution. To address the complex structured organizational system that has a hierarchical structure and consists of many functional subsystems with relationships, both vertically and horizontally. Increase the efficiency and quality of management of educational institution depends on the depth system analysis and orientation methods and control algorithms to achieve a positive result.

Today there are a large number of e-learning management systems in higher education. Most focused on Web-technologies that are implemented using Web [3,4].

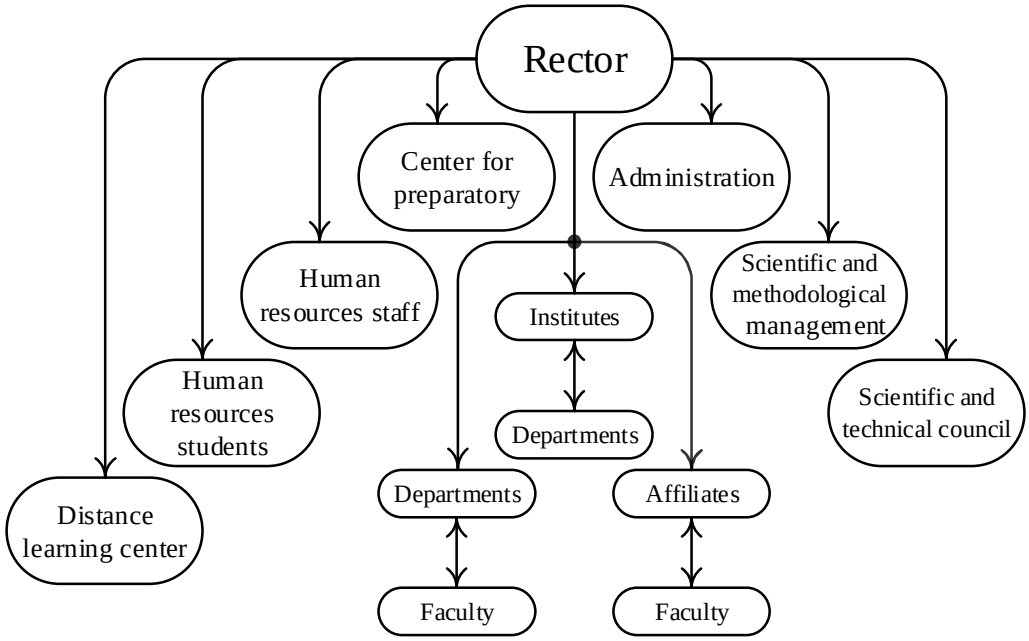

Fig. 1. Functional architecture model of university management

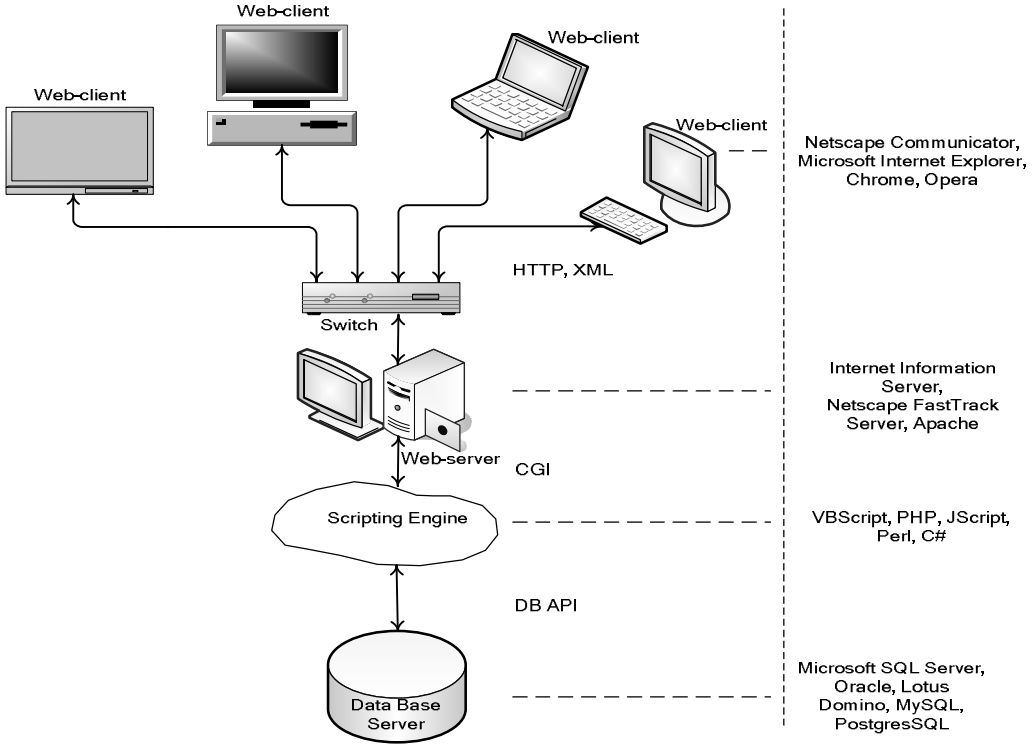

Fig. 2. Conceptual scheme of management of educational process

A significant impetus to the development of e-governance has made provisions for electronic educational resources, approved by the Ministry of education and science, youth and sports of Ukraine 01.10.2012 No. 1060 and registered in the Ministry justice of Ukraine R. No. 1695 / 22007.

Given his own experience of creating e-books and placing them in the world wide web, the systems deliver educational material and administration of higher education institutions about classify Web system.

All such systems are classified according to certain functional categories: the administration of the university; the reports of educational material (Educational Delivery System), which provides interaction between the listener using Web technologies; the management courses (Course Management System (CMS) – a software product; the learning management Learning Management System (LMS) is a software

product that provides the listener with integrated information from the course on the work done in accordance with the curriculum.

Common to all systems is a conceptual diagram of delivering educational material, which is shown in fig. 2.

Its constituent parts are: the kernel, which is based on a Web server and provides the processing logic of the system through the mechanism of scripts and supports a Web interface; the information store database, built on the basis of a relational DBMS with support for distributed technologies; the user environment, which through the mechanism of interaction with the kernel allows the user to work interactively in the system.

The existence of marked components requires, as the design of the system as a whole and the detailed design of individual parts, includes modeling subsystems of control information, data, etc.

The development of a prototype system based on Web technologies

Systematic analysis when building functional models at the design stage using UML diagrams and patterns gives a clear understanding of the system structure, functions, data flows between subsystems of the integrated automated management system of the educational institution and the educational process [5, 6].

When building learning management systems based on Web technologies to solve the following tasks: the determined content, developed the structure and funds management; the generated database of students and a knowledge base of training courses in the subject area; the developed algorithms and tools for interaction between student-teacher; the organized process of delivery of training materials, training and testing; the subsystem statistics and analysis of test tasks. The logical structure of the learning system shown in fig. 3.

Created logical structure to access all materials and normative documents regulating the study process. Using the system, users have access to: curricula of training, qualification specialists, information about the Department and faculty, online news and forums, as well as in the training, test materials in the disciplines.

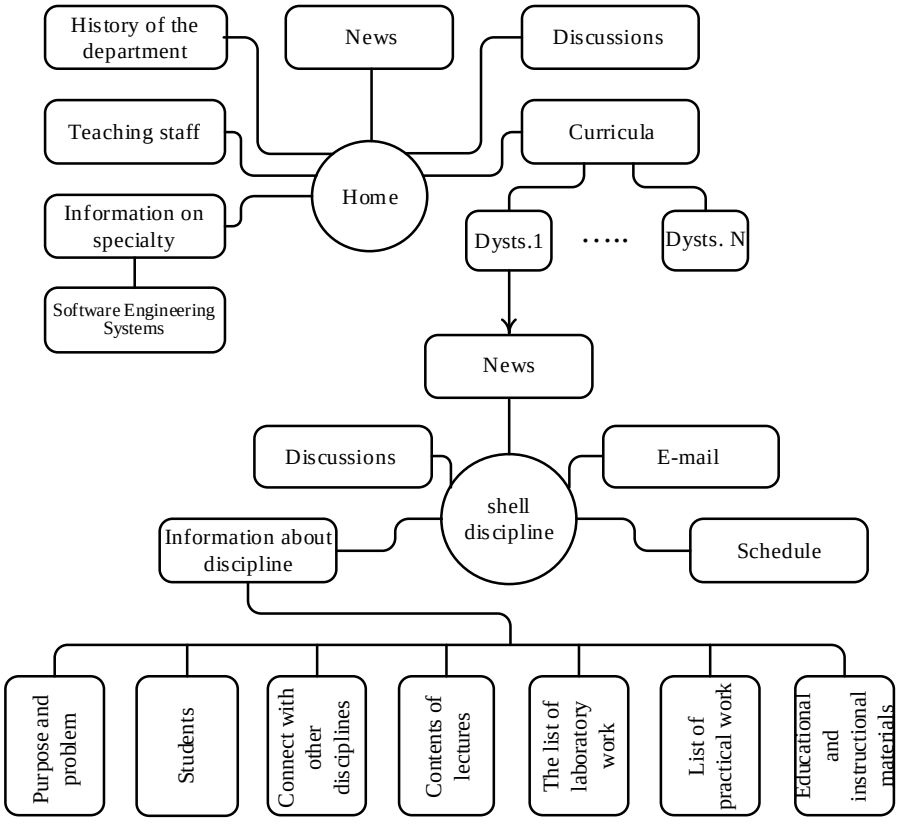

Fig. 3. the Logical structure of educational Web-system

This subsystem can be integrated into the university system. Integration it provides the only way of access to resources, both the subsystem and university resources. Developed a prototype subsystem contains the traditional means of interaction – discussion and electronic bulletin boards; shell discipline has a standardized appearance.

The decision of actual problems of school management system

Consider the following task management of higher education: the system analysis of the current status of universities and forecast compliance with its operation of the development; the task of situational control and making operational decisions on local optimization using systems decision support; the task of global optimization functioning of universities lies in the choice of these available settings that best meet the objectives of the strategy for the development of educational institutions [2].

The solution of each of the tasks listed above requires an appropriate level of automation of information processing within the proposed models of higher education.

Conclusion

Using the system, users have access to: curricula for bachelors, specialists and masters, as well as information about the Department and faculty, access. The advantage of the proposed system is the integration of normative documents regulating the conduct of the educational process in the university curriculum of the specialty, the working program of the discipline, the teacher's load) with information about the discipline. This forms a holistic view of the user of the learning process and provides a single point of access to all information associated with the educational process.

This uses different mathematical, mathematical domain model and control, it is possible to combine models with each other to create an integrated model of the learning process.

Thus, the development of problem-oriented systems of university management is the main approach to build the structure of the system and the formalization of heterogeneous data and knowledge in mathematical models.

The proposed method (combination of methods) that can unify the structure and used mathematical apparatus for the development of integrated models.

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