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STUDENTS' MOBILE PORTAL: EXPERIENCE OF THE NATIONAL MINING UNIVERSITY OF UKRAINE

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Abstract

Within the framework of the international project „Integrated University Management System: Borrowing the European experience of the partner countries" universities management systems was analyzed in the European Union universities and their counterparts in the countries of the former Soviet Union. Research on the university's management business-processes showed the high importance of feedback from stakeholders and employers, as well as an interest in the comprehensive provision of information on the activities of the university on the Internet. In addition, the search for relevant information on various aspects of the university for the person who is not familiar with the specific implementation of an electronic management of the university is a non-standard and challenging. Such difficulties are solved systems of the "Portal", where structured information about the university is collected, aggregated and delivered. The article describes the background, analysis and stages of development of student mobility portal of the National Mining University. Standard requirements for development of student's private cabinets are proposed.

Keywords*: integrated information system of university management, students' mobile portal, portal, software architecture, software construction.*

1. Introduction

Analysis of domestic and foreign research and publications on the development and creation of corporate information systems has shown that at a new coil of development of information technologies, questions are being raised over the multi-aspect information handling and the organization of information exchange in the interests of participants of actual working processes in the first place. Under the new conditions, management approaches for various corporate systems,

including systems for the support of scientific and educational activities, change. There is a shift from a functional-oriented approach to a process-oriented one, which supports the quality management system strategy, customer orientation, possibility of reacting to changes. In this regard, there arise the problems of adapting corporate information systems and automation tools of corporate activities to the changing conditions of their use. Of particular relevance is research of domain modeling problems, the transition from the use of static models of subject domain activities to the developing dynamic models as well as the issues of further development of management methods for differentiation of access when developing and employing corporate electronic environments.

2. The degree of investigation of the problem currently, and purpose of research

Modern portal technology platforms are characterized by toolkits that provide differentiation of access control using role-based approaches.

In this regard, afore-mentioned problems lead to the need for a solution being of great importance as a major scientific problem and consisting in investigating the issues of information management through the corporate electronic information environment, the development of integration mechanisms ensuring creation of a common information space, taking into account the existence of inherited multiplatform components and automation tools in this environment as well as the multi-aspect information handling, including managing corporate knowledge, managing the process of collecting and updating its own information resources, emerging in the process of educational and scientific activities. [1]

According to the Conception of modernization of Russian education for the period until 2010, the main objective of vocational education is "training of a skilled worker of an appropriate level and profile, competitive in labor market, competent, responsible, having skills necessary for his/her profession and orienting in the adjacent spheres of activity, capable of efficient work in the specialty at the level of international standards, ready for continuous professional development, social and professional mobility; meeting the needs of the individual in obtaining proper education".

Solving these problems is directly linked with the development of skills of "problem" creative thinking of future professionals, the development of skills of independent work. This implies the need to enhance the role of students' independent work on the study material during the training period, which entails corresponding reorganization of the educational process. The student should be conscious that he/she is a full participant of the educational process. That is where the main efforts should be directed to create a unified information-educational environment in which each individual passes a unique way. With this educational process organization a teacher is only one of the sources of self-directed development for a learner. His/her task is to create an environment that allows everyone to make conscious decisions concerning his/her own freedom: what is being studied should have a specific meaning in the life of the student, who should not simply take certain knowledge and values, but also put them into practice. Such a teacher is not even an instructor but a participant of the dialogue with the students, building equal relations with them to allow free research in the information and educational environment where there are necessary tools and materials, there is a teacher-consultant and an open access to everything.

In its turn, intention to form information culture of future graduates leads to the orientation of education toward acquisition of students' knowledge on telecommunications and media, use of telecommunication means for acquisition of various knowledge and creative expression, evaluation of reliability of information, development of critical thinking, correlation of information and knowledge, an ability to organize information process properly, to evaluate and ensure information security.

Telecommunication systems are of paramount importance not only in the education system; they also play a fundamental role in almost all spheres of the society. At the level of development of the telecommunication information space, the level of development of primary networks and the level of development of network information technologies have the most significant effect on them.

With all the variety of information and communication technologies, as well as ways of data organization when transmitting it over communication channels, the global information computer network Internet occupies a central place. Moreover, today, it is practically the only global telecommunication network that is widely used in the Russian educational system. This is largely contributed by high speed and reliability of data transmission over the Internet in various formats (text, graphics, sound, video, etc.). The Internet provides an opportunity of collective access to training materials that can be represented as simple tutorials (electronic texts), as well as in the form of complex interactive systems, computer models, virtual learning environments, etc. The number of users and information sources on the Internet is continually increasing. In addition, there is a constant improvement in the quality of the Internet telecommunication services. Because of this, high-quality access to the Internet is gained by not only companies and organizations working in the economic and other fields, but also educational establishments.

Today's Internet is characterized by serious problems of organization of the global information search. The so-called search systems have been developed to help users by a desired word or a combination of words find references to those pages in the network, in which this word or combination is represented. However, despite the availability of existing search systems, the user has to spend a lot of time on both information search and data processing and systematization.

In education, this problem is particularly acute: even if educational information resources are presented in the network, they are generally presented unsystematically. The lack of a systematic approach to the placement of such resources, as well as the lack of uniformity in addressing psycho-pedagogical, technological, aesthetic, ergonomic and a number of other problems under the development and exploitation of educational resources of the Internet, practically, leads to non-use of the benefits of telecommunication means aimed at improving the quality of the educational process.

Partially, this problem can be solved on the basis of development and implementation of complex information educational portals (integrated Web systems) described in this document. In this case, such portals, combining the basic information resources that have a high educational value, could be the "point of entry" into the modern telecommunication systems for all persons, one way or another connected with education.

It is obvious that creation of the sectoral distribution system of educational portals is one of the most important challenges facing the educational community. In the created unified educational information environment, educational portals should become principal sources of educational resources available on the Internet. [2]

Thus, creation of the university information portal, as a source of structured and easily accessible information on various activities of the University, is an important task in achieving high educational standards.

3. Methods and materials applied

Within the framework of the international project "Integrated University Management System: Borrowing the European experience of the partner countries" universities management systems were analyzed both in the European Union universities and in the countries of the former Soviet Union. Visionary university leaders realize that campus portals are transformational resources. These resources will change the way students, faculty, staff interact, learn, carry out research and work. Universities recognize that portals may be the way to engage stakeholder and client groups, empower them with access to branded campus information resources and communication tools and retain their loyalties as potential students or alumni. It is a community building tool.

For universities, the goal is to combine horizontal and vertical portal concepts into an integrated, personalized and customized dynamic interface for all users - in order to also foster a sense of community and belonging to the institution. This portal has to be simple, easy to use, convenient and comprehensive in its access to information, people and processes. Its development requires strategic thinking and co-operation between disparate units on the campus. Although the technical challenges are considerable, the real challenge is to foster an organizational culture change - and changing organizational cultures is very difficult indeed. [3]

This paper discusses the methodological goals and directions of portals development in general and their offshoots such as the student's mobile portals. The structure of a typical web-portal and its participation in the business processes of university management are discussed. Also a model of interaction with the data and users is proposed; typical modular design of the student’s mobile portal is offered.

4. Goals and objectives of the student mobile portal creation and implementation

The purpose of the university portal creation is providing users with structured readily available thematic information of scientific, educational, informational and other profiles of the university activities.

In general, a portal is an aggregator and classifier of information from various sources, providing access to information of interest with the highest possible speed and lowest possible labor costs for its search.

Due to the explosive development of mobile Internet-terminals used by young people in general and students as the most intellectually developed part of young people, in particular, now there arises the question of optimization of existing or developing portals under the format and standards of mobile devices.

Consequently, development of the concept of creating and implementing student mobile portal is an important and urgent challenge for any higher educational establishment.

5. Results obtained and discussions

The definition of the term "portal", as a source of aggregated and classified information for the end user, imposes architectural restrictions on it expressed in the form of the list of requirements to portals:

- aggregation of information from multiple disparate sources;
- classification of the collected information and its storage in the form which provides the greatest possibilities for access to the information of interest with the highest possible speed and lowest possible labor costs for its search;
- delivery of necessary information to the user in a convenient format.

Thus, the portal structure represents itself a double client-server system in which portal server is simultaneously a client, gathering information from disparate sources and a server for the user, delivering him prepared information (Figure 1).

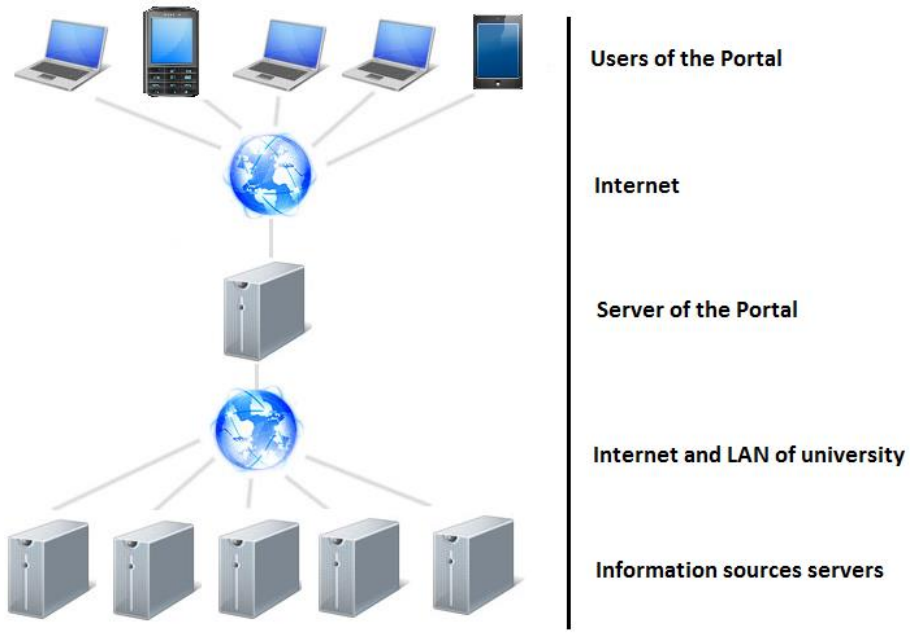


Figure 1: University portal structure

To achieve the objectives set, the portal software tools should combine both means of collecting information (collection scripts, program analyzers, means of interaction with information storage systems) and means for storing the collected information – databases and means of working with them for better analyzing and structuring.

To deliver information to the user, it is recommended to apply the web programming languages, along with the means of standard markup of information, that is, the combination of the dynamic component of the web portal and the static information that does not depend on the time and user requests.

Automated business processes

Interpersonal messaging

Interpersonal messaging in the frames of the system implies that the portal users are able to read and send messages to both specific portal users and groups of users.

Working with the electronic library

This business process implies that the user, entering the appropriate page, can either pursue a personal viewing of the entire catalog of the contained literature or limit the scope of his/her search by certain criteria. As a result of this process the user will be prompted to either download an electronic edition or read its content online.

Working with the cartographic information on the university and transport connection

Working with the cartographic information implies that the user is not a big expert in terrain orientation in general, as well as at the university and its surrounding areas, in particular, that's why this service implies support for the user when searching for routes both at the university and in the surrounding areas.

Conducting personal and University timetables

Working with schedules suggests that the user can conduct and view the plans and schedules of both classes and personal activities in the frames of the portal functionality.

Viewing information from the publicly available University webcams

This service allows the user to select and view the video information from the available University webcams.

Accounting and control of the working time in the computer rooms

This service allows the user to select and view information about publicly available University computers**.**

Information support of the organization and carrying out of work with clubs

This business process is designed to run the information component of club's activities.

Working with lists of users

This business process is auxiliary and it is intended to support the working capacity of the system as well as to serve as an instrument of regulation of portal users.

Under the access to business processes it is recommended to use the role system in which the following users will be determined:

- student;
- warden;
- group (club);
- teacher;
- moderator;
- portal administrator.

The user in all business processes is entitled to: access, search and editing.

The access rights can be divided into three main categories:

– editing (including the establishment);
– reading;
– lack of access.

In each of the rights the user can be restricted depending on the security requirements of the business process.

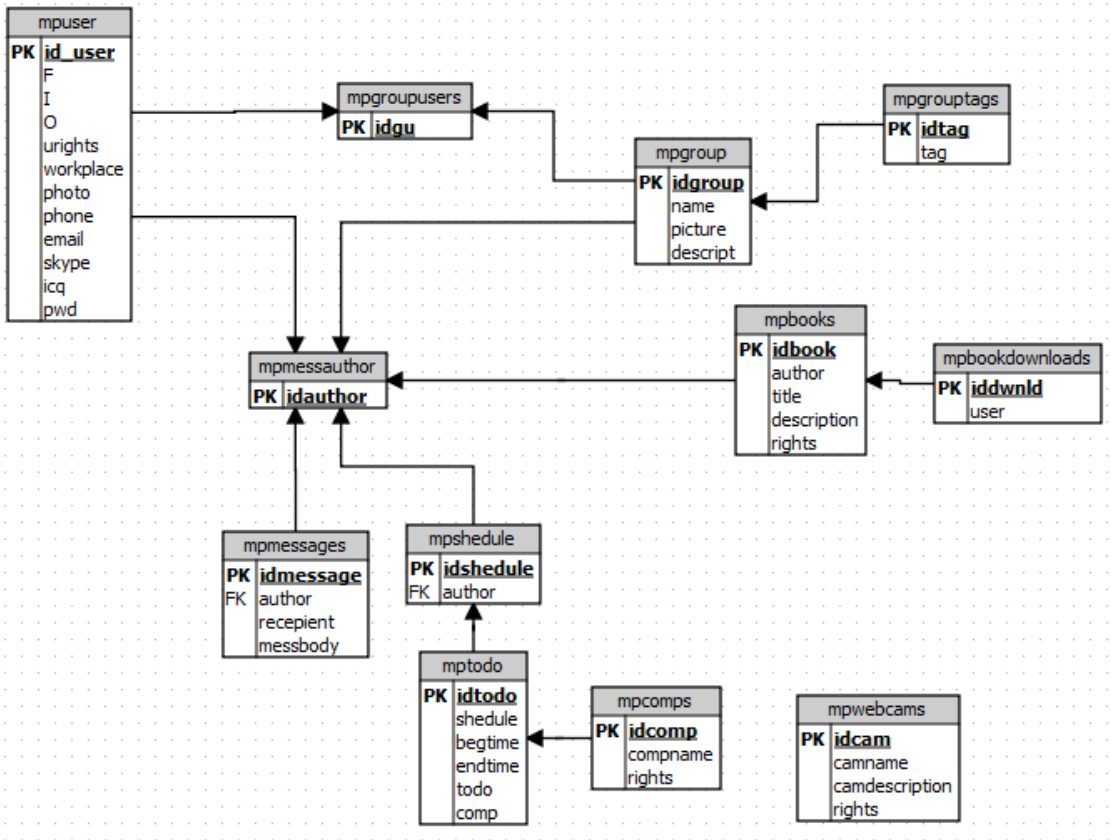
Recommended functional modules

Proceeding from the described business processes, the following modular structure of the student mobile portal is recommended:

- working with lists of users (administrative module);
- information support of the organization and carrying out of work with clubs (clubs and groups);
- accounting and control of the working time in the computer rooms (computer rooms);
- viewing information from the publicly available University webcams (cameras);
- working with the cartographic information on the university and transport connection (maps);
- conducting personal and University timetables (schedule);
- working with the electronic library (library);
- interpersonal messaging (message).

Each of the proposed modules should implement the functionality of the corresponding business process.

Classes and database structure



User-system interaction

With the user-system interaction it is recommended to use various options of applications, namely – a web application or a native mobile application. For web applications it is recommended to create a single interface that will be configured for the conditions and requirements of mobile terminals. It is desirable to perform native applications in the same style, but the possibility of its modernization doesn't raise any doubts.

6. Conclusions

The proposed in this paper practical experience of cooperation in the framework of the "University - Students – Stakeholders" generalizes earlier studies in several European universities and research

of the international project “Integrated System of Management of the University: Borrowing the European experience of the partner countries”.

The main conclusion of this paper is proposing a model of aggregation of data and issuing it to users via a specialized data management information system of the university called “Student’s mobile portal”.

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Rezumat

În cadrul proiectului internațional „Sistemul de Management Universitar Integrat: Preluarea Experienței Europene de Țările-Partenere” a fost efectuată analiza sistemelor de management universitar din Uniunea Europeană și din țările fostei Uniuni Sovietice. Cercetarea business-proceselor de management universitar a demonstrat importanța deosebită a feedback-ului cu părțile interesate și angajatorii, precum și cointeresarea tuturor în furnizarea de informații complete în cadrul Internet-ului cu privire la activitățile universității. În plus, căutarea, de către o persoană nefamiliarizată cu aplicarea specifică a sistemului de management universitar electronic, a informațiilor relevante referitoare la diferite aspecte aferente activității universității, este o problemă nestandardă și dificilă. Astfel de dificultăți sunt rezolvate prin intermediul sistemelor de tip "portal", în care se efectuează colectarea, agregarea și furnizarea de date structurate despre universitate. În articol sunt descrise condițiile, analiza și etapele creării portalului studențesc de mobilitate în cadrul Universității Naționale Miniere. Sunt propuse condițiile standard aferente creării birourilor personale de tip portal pentru clienți.

Cuvinte-cheie*: sistemul informațional integrat al managementului universitar, portal studențesc mobil, arhitectura programului, construirea softului.*

Аннотация

В рамках работы международного проекта «Интегрированная Система Университетского Менеджмента: Заимствование Европейского Опыта Странами-Партнерами» был проведен анализ систем управления университетами в странах Европейского Союза и их аналогов в странах бывшего СССР. Исследования бизнес-процессов управления университетом показали высокую значимость обратной связи с заинтересованными лицами и работодателями, а также заинтересованность во всестороннем предоставлении информации о деятельности университета в сети Интернет. Кроме того, поиск необходимой информации о различных аспектах деятельности университета для человека, не знакомого с конкретной реализацией системы электронного управления университетом, является нестандартной и сложной задачей. Подобного рода затруднения решаются системами типа «портал», в которых происходит сбор, агрегация и выдача структурированной информации об университете. В статье описаны предпосылки, анализ и этапы создания студенческого мобильного портала Национального горного университета. Предложены типовые требования к построению клиентских личных кабинетов портального типа.

Ключевые слова: *интегрированная информационная система управления университетом, студенческий мобильный портал, портал, программная архитектура, конструирование программного обеспечения.*