

Conceptual Model of Developing a New LMS System of the Faculty of Transport and Traffic Sciences

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Abstract. *The e-Learning system of the Faculty of Transport and Traffic Sciences has been continuously developed since 2004 for the study requirements according to the German study concept of the Fachhochschule and according to the specific study characteristics in the Republic of Croatia, using a modular approach. Currently there are five modules functioning (DMS, SAN, e-Student, SMSCentar and FPZmobile) which together form the Learning Management System (LMS) of the Faculty of Transport and Traffic Sciences.*

DMS (Document Management System) is a system for managing documents and processes which is used for authorized access by the Faculty staff members to modules: control of work of the computer laboratories (check of access to exercises, etc.), e-Learning system administration (publishing of teaching materials, control and grading of seminar papers, etc.) and the module for documents and processes management within the Faculty (orders for equipment, report on failures, updated on-line directory, etc.)

SAN (cro. Sustav autorizacije i nadzora, eng. The authorization and control system) is a set of applications which applies the advanced IT technologies to allow supervising the work of students on the computers at the computer laboratories of the Faculty of Transport and Traffic Sciences and personalization of the working environment in the Windows operation system, regardless of which computer is being used by the student.

The e-Student system is the student user module which allows authorized access of students to the teaching materials, exercises, tests and instructions. Apart from the mentioned, the system provides support to the application and making of seminar papers and various forms of tests (e-Blic, e-Test, e-Kviz).

The SMSCentar and SAN system with smsCRM application (Customer Relationship

Management using SMS service) open up the possibilities for an entire series of information services for the students and the staff of FPZ, based on interactive communication using SMS messages. Currently, the interactive services available to students, related to PCLab, are the services of acquiring the computer status at the PCLab and services of reserving the time of working on a computer at the PCLab. By sending an appropriate SMS message (message of a certain format and content) to the GSM number of the terminal device at the SMS Centre, the application SMSCentar forwards the request to SAN Server module which returns then a message containing the computer status at the desired PC lab. There is a number of possible applications of SMS service with the aim of raising the quality and speed of informing the teaching process participants through e.g. information about the changes in the schedules regarding classes and practical work, current information on the status of the seminar paper, information about the examination terms or terms of tutorials, results of exams, and reports on computer failures, etc.

Three years ago a module has been added to the FPZ e-Learning system in the form of interactive application for real-time informing of the students using mobile terminal devices, called FPZmobile. The basic idea was to develop an application that will provide accurate and updated information related to the Faculty affairs and student achievements (seminars, exercises, quizzes, etc.) during the study, in a form adjusted to control on the interface of mobile terminal devices, such as mobile phones, PDA devices or smartphones. Since the targeted users of the application are students, the decision was made that it was best to develop an application that would be used on a maximal number of mobile terminal devices, and its application would allow access to relevant

information, at any moment, regardless of the user location or user terminal equipment.

The modularity of the FPZ e-Learning system allows fast implementation of new services according to the ideas and suggestions expressed both by the teaching and non-teaching staff, and the students. The LMS system of the Faculty of Transport and Traffic Sciences has been in operation for 6 calendar years, i.e. five full academic years, which has been used by 362 users (administrator / teachers) for 509 subjects. There is a total of 7489 students who use the system which represents an application at 100% of courses at undergraduate and graduate programmes. During five academic years of working of the system, the students used the system 836,870 times in order to submit 15,906 topics for seminar papers for a total of 15,033 seminar papers. Within the same time period the teaching staff used the system 48,444 times in order to publish 2742 pieces of information for the students and to publish 5645 files of teaching materials.

The application of the system has indicated the positive sides of studying using the LMS system at the Faculty of Transport and Traffic Sciences. The students have accepted extremely well the freedom provided by LMS-supported studying and the number of students who complete their tasks from midnight until eight o'clock in the morning and from 4 p.m. till midnight has been gradually increasing over the academic years, with a constant decrease in the number of students completing their tasks in the period from eight in the morning until four in the afternoon. It is significant to note that with every new academic year the number of submitted seminar papers has also increased and that in the academic year 2008/2009 compared to 2007/2008 there were 22 per cent more seminar papers. In order to maintain the level of the quality of studying in the academic year 2008/2009 the number of rejected seminar papers increased significantly, as well as the number of papers graded as sufficient with the effect of the decline in the number of papers graded as very good or excellent.

Apart from the mentioned positive side of studying using the application of the Faculty e-Learning system many drawbacks have been noticed. The currently active system has been developed for the needs of studying according to the old study system. As such it is not capable of satisfying the studying requirements according to the Bologna Process, the program: "Learning

Results at the University of Zagreb" nor to the new technological possibilities provided by the present web services. Consequently, a concept of a new e-Learning system has been developed, which will be capable of satisfying all the necessary requirements.

The set requirements according to the new system brings forward the principles and processes of studying according to the Bologna Process which differs in many things from the old studying system. The studying processes of the Bologna Process require continuous monitoring of the students' achievements during the education at the Faculty. This encompasses continuous learning and monitoring of the students' work and eventually also the crediting according to the realized results. In the end the e-Learning system has to generate an electronic version of the folder of every single student. The development of new technologies and services applicable in web systems makes it possible to reduce the known drawbacks of the e-Learning system. The implementation of web 2.0 service such as wiki, blog and forum systems will provide the new possibilities in knowledge exchange and management with the aim of better acquiring of the subject matters required of the students. Web 2.0 services provide students with better participation in the teaching processes through the possibility of generating the user contents in the form of additional materials and knowledge. The reduction of the problems in communication between lecturers and students, and among students, that occur with the application of the e-Learning system, will be reduced by the application and integration of web 2.0 of social networks such as Facebook and Twitter system. The possibilities such as starting of forums and wiki systems for individual courses of study, subject and even for a teaching unit, will significantly reduce the lack of communication and interaction of students and the lecturers and the very e-Learning system.

Keywords: web 2.0, LMS 2.0, Internet, e-Learning, study, SMS, m-learning

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