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LMS 2.0: NEXT GENERATION OF E-LEARNING

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Abstract: *The e-Learning System of the Faculty of Transport and Traffic Sciences was designed, developed and implemented in 2004. The system consists of 5 individual modules (DMS, SAN, e-Student, SMSCentar i FPZmobile). The new system will be adapted to the needs of studying according to the Bologna process as well as the current trends in learning technology and communication both between students and between students and teachers. The model proposed in this paper will provide guidelines for developing the system according to the e-Learning 2.0 paradigm, which makes use all the Web.2.0 tools.*

Keywords: *LMS 2.0, Web 2.0, e-Learning, social network.*

1. INTRODUCTION

The Learning Management System (LMS), designed by the Faculty of Transport and Traffic Sciences (FPZ), has been in use since 2004, when it was developed according to both the German Fachhochschule concept and specific requirements of studying in the Republic of Croatia at that time. The system consists of 5 individual modules (DMS, SAN, e-Student, SMSCentar i FPZ*mobile*) which in mutual synergy represent the LMS of the FPZ. Although there have been improvements in the quality of the studies, the module has also indicated the existence of problems arising from the system processes, technologically obsolete equipment as well as the inability to support the Bologna process and the "Outcomes of Studying at the University of Zagreb" (SveZaIU) program [1]. It is necessary to minimize or completely eliminate the negative aspects of the LMS usage as well as the shortcomings in the operation of the existing system in order to reach the desired level of the quality of studies. For this purpose, an entirely new system will be developed, based on the model described in this paper. The new system will be adapted to the needs of studying according to the Bologna process as well as the current trends in learning technology and communication both between students and between students and teachers. Furthermore, the model proposed in this paper will provide guidelines for developing the system according to the e-Learning 2.0 paradigm, which makes use all the Web.2.0 tools, such as Wiki, Blog, forums, social networking and others, in its operation.

2. LMS 1.0: READ ONLY E-LEARNING

The e-Learning System of the FPZ was designed, developed and implemented in 2004 to satisfy the needs of studying according to the German Fachhochschule concept as well as the specific requirements for studying in the Republic of Croatia. There are five modules currently in function (DMS, SAN, e-Student, SMSCentar and FPZmobile) which together represent the LMS of the FPZ.

The DMS (Document Management System) is a system used for managing documents and processes used by the Faculty staff for authorized access to the modules: monitoring of work in the computer labs (checking of the access to exercises, etc.), system of e-Learning administration (publication of teaching materials, checking and evaluating of seminar papers, etc.), and the module for managing documents and processes within the Faculty (equipment orders, malfunction reporting, updating of the online directory, etc.).

The SAN (English: The authorization and control system) is a combination of technologies and applications which enable monitoring of students working in the computer labs of the Faculty.

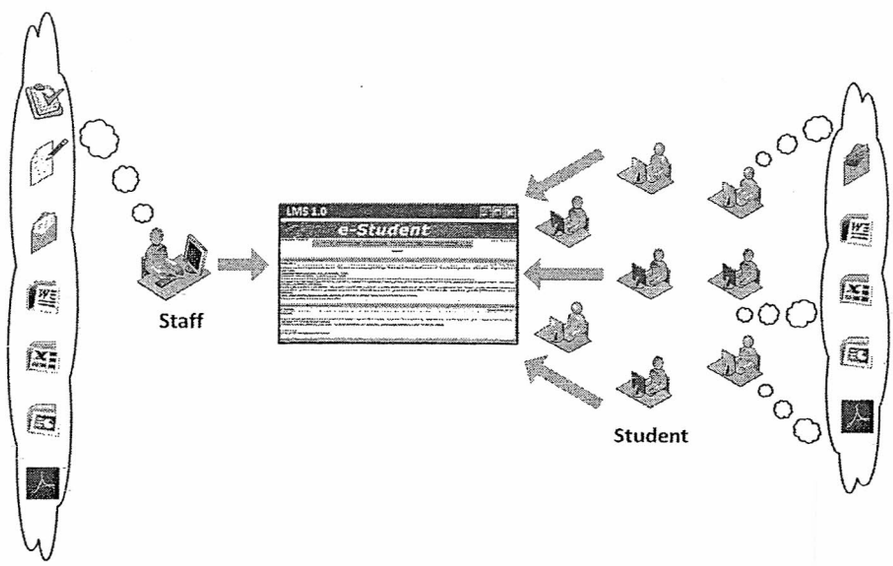

Figure 1. LMS in use at the FPZ

The e-Student system, as shown in figure 1, enables authorized access to the teaching materials, tasks, exercises and instructions to students. Furthermore, the system provides support for the registration and creation of seminar papers and other forms of knowledge testing (e-Blitz, e-Test, e-Quiz).

The SMSCentar and SAN system, supported by the smsCRM application (Customer Relationship Management via SMS), present possibilities for a wide range of information services, based on interactive communication through text messages, available to both students and the Faculty staff alike [2].

Within the last four years yet another module has been added to the e-Learning system of the Faculty in the form of an interactive application, called FPZmobile, which provides real time information to students through mobile terminal devices [3].

All systems are based on communication realized through SQL database as well. This enhances the modularity of the system, i.e. upgrading and system changes are made easy, which in turn makes it possible to adapt the system for operation at other faculties. The implementation results of this system are shown in previous author's papers [4].

3. LMS 2.0: SOCIAL AND USER GENERATED E-LEARNING CONTENT

Many advantages as well as disadvantages and technological obsoleteness have been noticed in the last 7 calendar years, i.e. 6 academic years, during which the current LMS has been in function. Furthermore, while developing and using the current LMS, new insights and knowledge have been gained, which will be used in designing a new LMS.

Over the last several years, the Web 2.0 concept has significantly altered the paradigm of user participation on the Internet, shifting from the passive, "read only" kind of participation to full, active participation of all users in content creation. The definitions of the Web 2.0 paradigm vary considerably from author to author; however, they are not mutually exclusive, since each definition includes the concept of active user participation in content creation, collaboration, as well as knowledge and information sharing [5]. As such, the Web 2.0 constitutes the ideal platform for LMSs within which students become active participants in content creation, thus changing learning paradigms. As can be seen from the overview provided in this paper, students already play a significant role in creating content within the LMS. With the application of Web 2.0 paradigms, services and technologies in instructional processes and LMSs most drawbacks can be overcome [6], which will contribute to the quality of instructional processes as well as enable students to participate more fully in content creation. Virtually any Web 2.0 technology or service may be applied in the LMS 2.0 model. Most authors agree that blogs, microblogs, wikis, RSS feeds, tag-based folksonomies, social bookmarking, multimedia content sharing, forums and social networking sites are becoming a crucial part of the tertiary level educational process [5].

Although Web 2.0 technologies and services provide a number of advantages, such as allowing students freedom and flexibility, some of those listed may have negative effects on student education. For instance, the Wikipedia exerts practically no control over the information which is entered. The information is often incorrect or has not been verified, which is very difficult for instructors to monitor and respond to in time-

ly fashion. For this reason, the new generation model, LMS 2.0, proposes the incorporation of Web 2.0 technologies (wiki, forum, tag-based folksonomies, social bookmarking, RSS, social networking) within the LMS in order to maintain the quality, accuracy and up-to-date character of important instructional materials and information. In contrast, some Web 2.0 services are used as an external addition to the LMS, (Facebook, Twitter, Academia.edu, LinkedIn, etc.), as can be seen in figure 2.

According to this conceptual model, the basic principles on which the e-Student system operates, described earlier on in this paper, remain practically the same. Students will continue to access instructional materials added by instructors, register topics for seminar papers as well as submit them, take e-tests and the like. Adding Web 2.0 functionalities will introduce a range of new services and benefits.

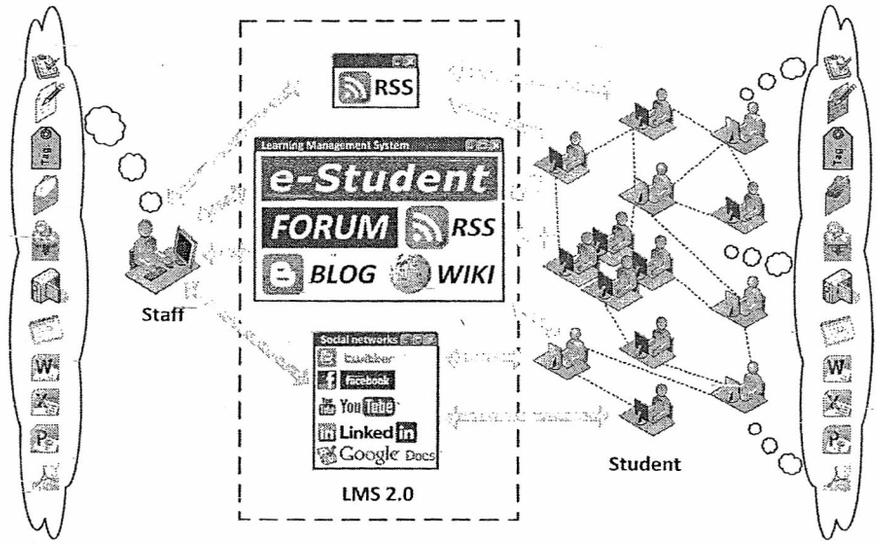

Fig. 2. Conceptual Model of LMS 2.0 at the FPZ

Wiki: The Wiki system has been implemented in the LMS in order to control the content, which would allow the quality to remain constant. Each student has the opportunity to create, edit and add to the wiki content; however, instructors can easily correct errors and deal with possible omissions, all in one place. It is possible to create wiki content with every entry, whether it is related to an institute, department, instructor, or a course, teaching unit, lecture, seminar paper or e-test, which would complement the available instructional materials.

Blog: The Blog constitutes one of the essential Web 2.0 technologies in this conceptual model. Each student will be able to maintain their own blog as well as create blog entries for particular elements within the LMS. For instance, every student will be able to create a blog entry containing his/her review of a particular teaching unit or lecture,

which will contribute to the development of their critical thinking and investigative spirit.

RSS: The new LMS generation, according to the concept proposed in this paper, will offer the option of distributing multiple RSS feeds, whether these are RSS feeds of particular courses, institutes, departments, instructors or any other entity within the LMS, such as instructional materials and seminar papers. In this way, students can keep up with new information on an almost real-time basis. Furthermore, this model enables each student or instructor to use the LMS as an RSS aggregator, i.e. to aggregate and read their favorite RSS feeds within the LMS, as well as share them with user groups within their social networks or with individual users.

Forum: In addition to a typical forum which allows students and instructors to post unconnected topics, the new LMS generation will offer the option of starting a discussion topic for each entity within the LMS. For instance, it will be possible to start a discussion on any lecture or file, which will stimulate students' critical thinking, active participation and investigative spirit. On the other hand, instructors will be able to see what their teaching or a particular teaching unit may be lacking, which will enable continuous development and an increase in the quality of instruction and instructional materials.

Social networks: The application of social network principles within the LMS serves to increase communication between students. The proposed concept specifies the necessity of creating several types of social networks within the LMS. Two networks are predefined: one is a network of students in the same department and the other a network of students taking the same course. The third network would be created personally by each student according to his/her wishes and preferences. In addition to the internal social network, there will also be indirect communication (via RSS feeds) towards independent social networks such as Facebook, LinkedIn, Twitter and so on.

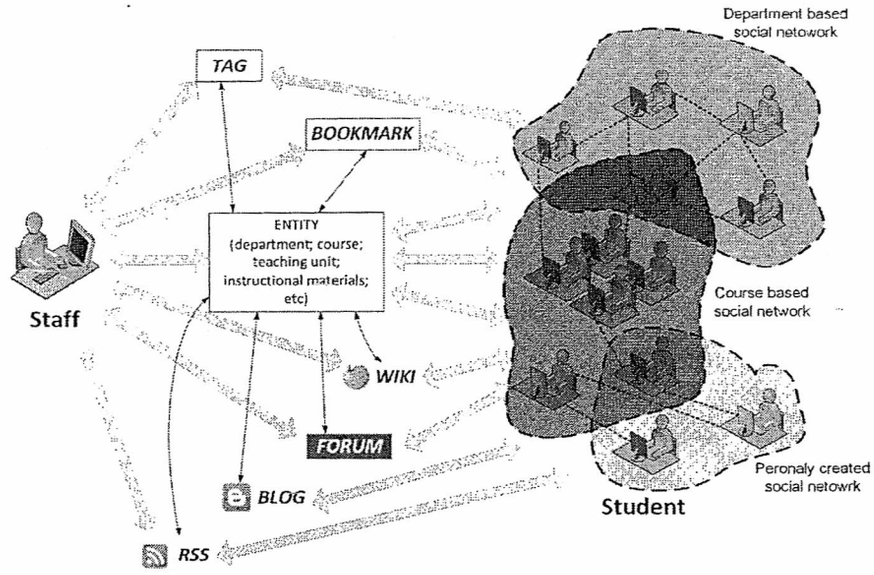

Figure 3. Creating, editing, tagging, storing and sharing of content

Implementing the above will enable fully flexible creation and editing of content, as well as tagging, storing and sharing of content between students, instructors and previously described social networks (figure 3.). Since all these modules make up the LMS of the institution, the entire content may be verified and its quality kept constant.

4. CONCLUSION

An analysis of the e-Learning system developed within the Faculty and in use for the past seven years, leads to the conclusion that the present system has become indispensable in electronic communication, both regarding the instructional process and student welfare. Both students and users have demonstrated a ready acceptance of the functionalities which have been developed so far, and they want and expect further expansion as well as the development of new system options. The greatest value of the system lies in the fact that it has been developed in its entirety at the Faculty of Transport and Traffic Sciences, in coordination with its teaching staff and students. Thus, the Faculty has become one of the leading faculties in Croatia in using the assistance of new technologies to aid students in the acquiring and evaluation of knowledge. Since a completely new system is about to be developed, it will be designed taking into consideration the goals mentioned above, but it will also aim to support and be integrated with Web 2.0 services. The new system will upgrade the processes of information exchange and publication, which will be adapted to the needs of each student by means of e-mail and text messages, as well as RSS feeds and integration with popular social networks such as Facebook and Twitter. The LMS 2.0 will

be designed fully in accordance with the model proposed in this paper, which is centered around the proposed use of up-to-date Web 2.0 technologies, adaptation to the Bologna education model and the "SveZaIU" program.

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