Education in Microelectronics Design Using a Web Environment

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Abstract – **A web-based environment for management of the educational process is being used for a couple of years in the ECAD Laboratory at the Technical University of Sofia, Bulgaria The system is developed aiming at the total archiving of the educational process, which allows improvement of quality. This is achieved by transparency, traceability, observation of deadlines, etc. The paper presents the capabilities of the latest version 8 of the e-Management environment. A Microelectronics desgn course is focused.**

Keywords – **microelectronics design, education, control, internet.**

I. Introduction

New technologies, Internet education, distant learning and other methods [1], [2] were massively introduced in the education during the last decade. Their primary objective is to implement computer and internet technologies for introduction of multimedia in the education [3]. Together with that the second main trend is to give a wider range of participants an access to the educational process via the transition to a non-auditorium based processes.

At the same time the auditorium based education has not lost its actuality and capabilities. It has been changed especially with the introduction of computer technologies. A number of educational courses are directly connected with their usage [4]. The principles for quality management, which are implemented in the ISO 9000 standards, were introduced to the education as well. All that imposed the development of a system for electronic accompanying (support) of the auditorium based courses. The e-Management is such kind of system.

II. E-Management

The platform has been developed for several years. Its primary objective is to combine the advantages of the internet technologies with the principles of the educational quality management for the needs of the auditorium based education. Initially, the system was used mainly for an info depot and student testing. The first subjects that implemented it are Surface Mounted Devices techniques [5] and CAD tools in Microelectronics (http://ecad.tu-sofia.bg/spm). Gradually the system was expanded with areas for education, testing and communication and archiving the auditorium based educational process using the Internet. The structures related to the information representation, educational schedule, laboratory reports and tests [7] and thus was obtained the environment for management and control of the educational process.

Each subject has a dedicated site. Its main information is publicly available – subject name, lecturers, syllabus, educational schedule, etc. – Fig. 1.

Fig .1. The Login page.

After the successful login the user is presented with two main zones – a navigation frame to the left and a work frame to the right. Group lists, users' directories and users' results are available to all users – Fig. 2. It is also possible to get access to the test results, answers to the self-study questions and other.

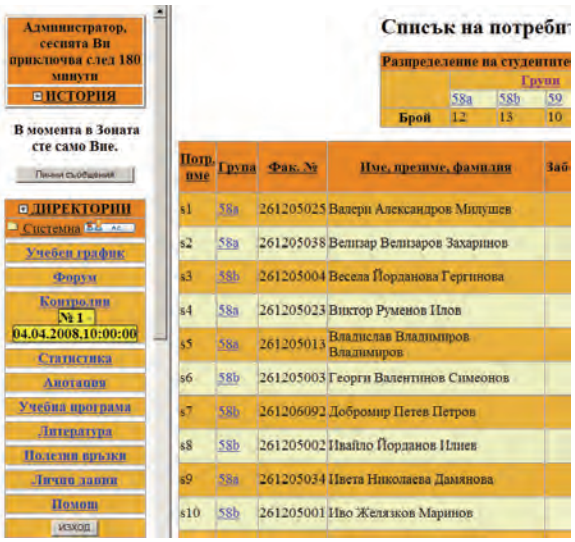

Fig. 2. Graphical user interface.

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A wide variety of statistical functions were implemented in version 7. They are related to: groups' distribution, distribution of exercise topics and classes, review of somebody else's materials, tasks' deadlines and report submissions, trial test results, average score, last score (marks), attending classes with other groups, being late for classes, forum activity, personal messages.

III. The New Moments in Version 8

The latest version 8 implements the concepts of the educational process unity related to the horizontal and vertical links. The horizontal unity requires all students to have the possibility to use a unified system for electronic accompanying of the education with equal access to all subjects. In order to accomplish that, a centralised database was introduced, which holds the user accounts of all students – Fig. 3.

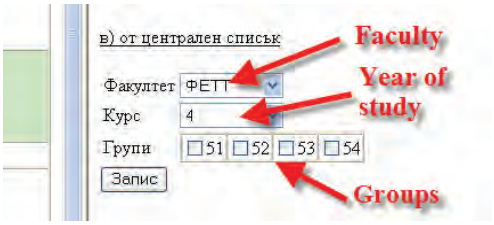

Fig. 3. Centralised user management.

In this way they can use one and the same username and password for all sites. When changing the password in one site the password for all other sites also changes. This helps for the more effective usage of the environment. The knowledge gained from different subjects is used in the education on Microelectronics and the integrated circuits design related to it. It is very useful to use the team approach when working on complex projects. The e-Management system is capable of meeting those requirements. The possibility of a unified transition between two subjects allows information related to the specific task to be exchanged. The data related to the educational process is shown in Fig. 4.

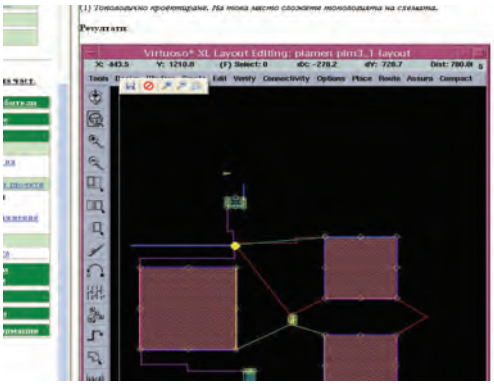

Fig. 4. A task report.

IV. Conclusion

The work that has been carried for the implementation of the E-management system revealed the necessity to change some concepts. At the same time the functionality was improved, which made the system easier to use.

The organizational activities were enhanced as well as the one for the statistical data processing. In this way the system could gain more admirers.

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