Information System for Preliminary Testing

Rumen I. Arnaudov[1], Ivo N. Dochev[2]and Milena A. Atanasova[3]

Abstract – **Contemporary education methods are more and more frequently employed in education. One of these methods is distant learning (e-learning). Its high efficiency rate, regardless of the distance between the teacher and the students is one of its main advantages. In the following article the program for preliminary testing and evaluating employed in the "Telecommunications measurements" course in the Technical University of Sofia is described. The program is based on a Linux operating system, Apache web server, MySQL database, HTML, PHP and JavaScript languages.**

Keywords – **Education, Distance learning education, Pretest.**

I. Introduction

Contemporary education methods are more and more frequently employed in education. One of these methods is distant learning (e-learning) [3-11]. A part of that education is the preliminary examination. It aims to check the students' knowledge of theory before having a lab session. The key advantage of that kind of examination is the unbiased evaluation and the speed of data processing.

II. Architecture

The software employed in the system in question is Linux OS [12], Apache web server [16], MySQL database [18], HTML, PHP [17] and JavaScript languages. The architecture of the computer and software configuration is displayed in fig.1. It consists of: users, Internet, local area network (LAN), web server, database (DB), firewall, HTML pages, PHP and JavaScript (JS) modules.

The users connect to the web server through the local network or the Internet. A firewall is used to restrict access to services that are to be used only in some of the laboratories. This aims both to protect information and maintain a more veritable record of the data received from laboratories. In the database are kept the usernames, the respective passwords, the test questions, the correct answers and the scores received from the test. The test questions are displayed in HTML pages, as for every question there are a number of answers with only one of them being correct. The JavaScript module is used to build a real-time countdown clock, used to display the time remaining to finish the test; the usage of JavaScript allows avoidance of network slowdowns at the initial starting of the clock. The PHP module serves as the link between the database and the HTML pages, as well as the test results processing. The use of a PHP module does not allow the users to view the source code of the application.

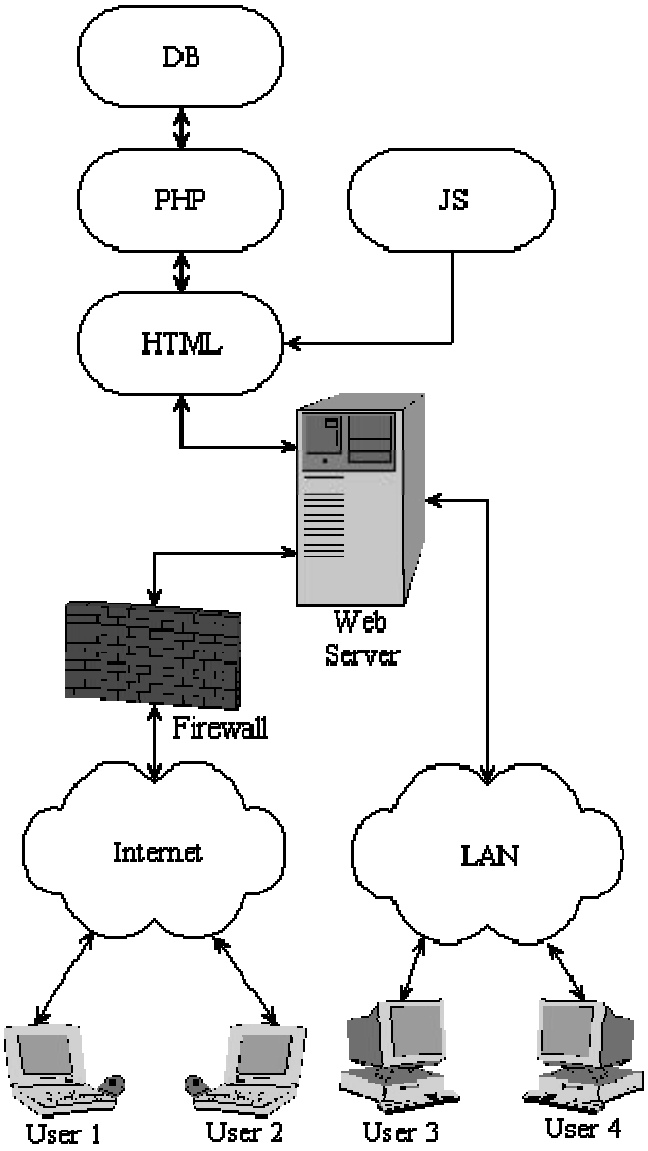

Fig. 1. The architecture of the computer and software configuration.

III. Algorithm

The algorithm of using the application is shown in Fig. 2. The link to the Web page of the "Measurements in Com-

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munications" course is through http://mc.vmei.acad.bg . The home page of the application is built by two main frames: a navigation frame (1) and information frame (2) (Fig. 3). The navigation frame contains the following links: Home, Introduction, Registration, Labs and Gradebook. The Information frame contains information for the selected link in the Navigation frame.

In order to access the application's resources the students must initially register as users. This can be accomplished through the "Registration" navigation menu (Fig. 4). The following information is required:

- faculty number
- full name
- study group
- password

After clicking on the "Register" button the data filled in is verified. Should there be any incorrect piece of data, an error message is displayed and the registration process must be restarted.

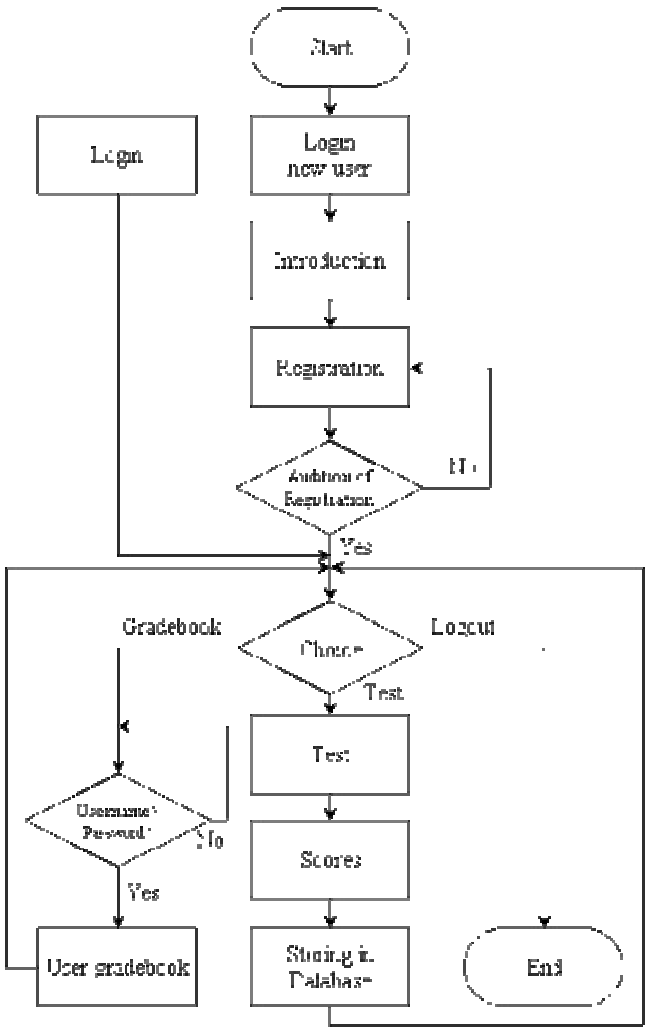

Fig. 2. The algorithm of using the application.

Filling in a preliminary laboratory test is accomplished by selecting the desired lab practice from the navigation menu and by clicking on "Test" on the Information frame(Fig. 5).

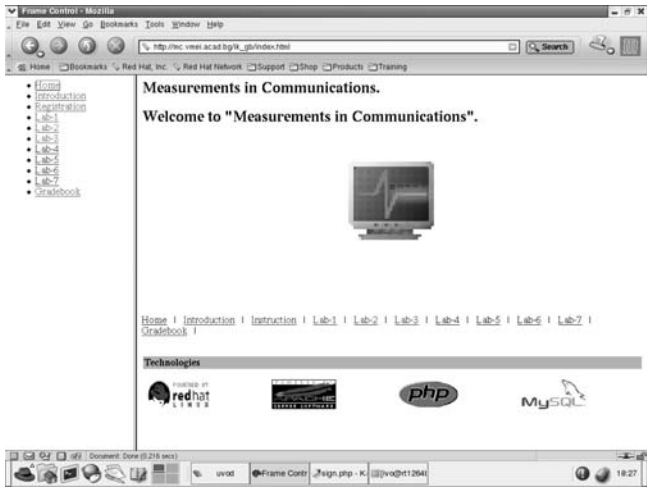

Fig. 3. The home page of the application.

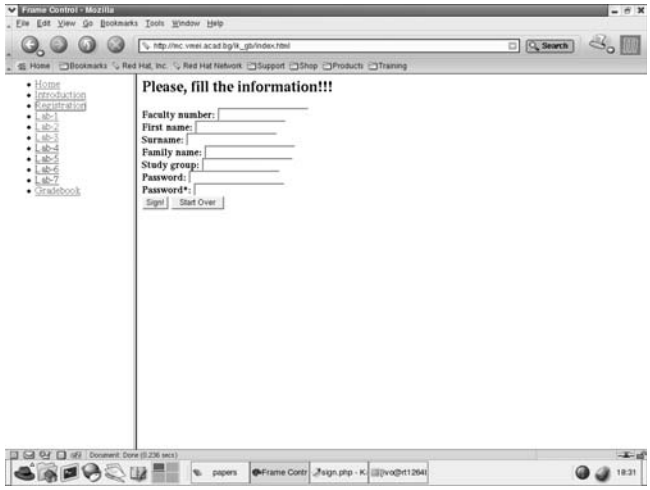

Fig. 4. The registration form.

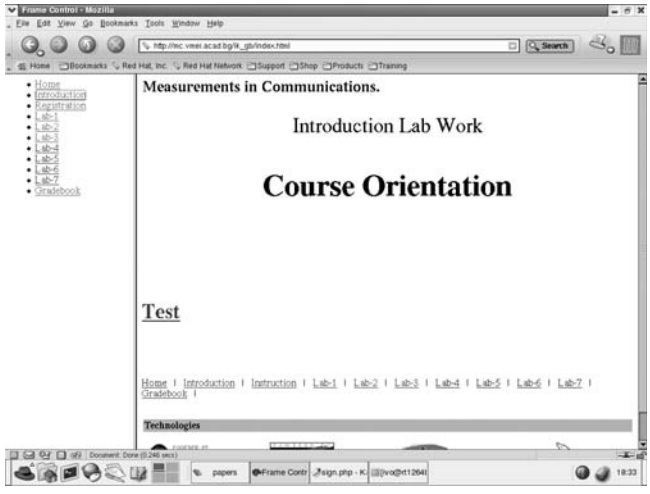

Fig. 5. The laboratory work home page.

After logging in (with faculty number and password Fig. 6) the student is admitted to the questions of the test. The Information frame of the test consists of two parts (Fig. 7):

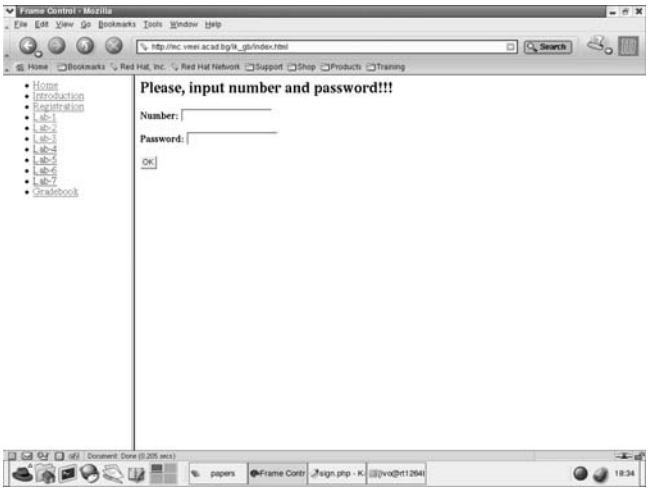

Fig. 6. The test logging registration form.

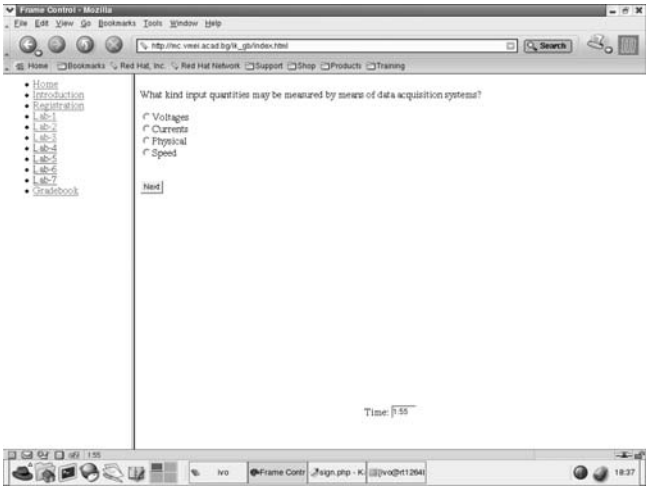

Fig. 7. The information frame of the test consists.

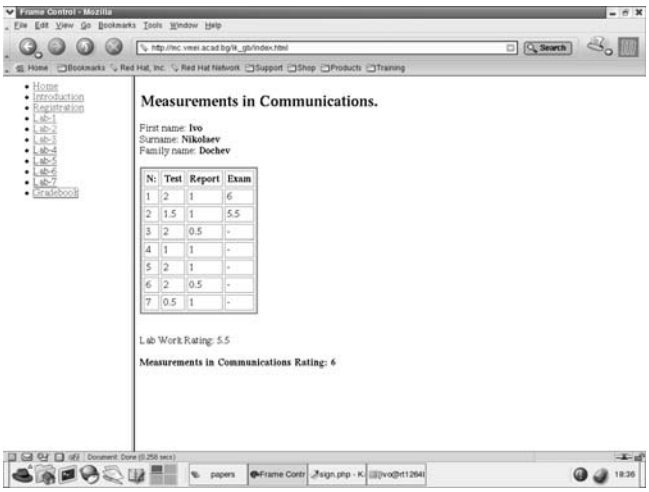

Fig. 8. The Gradebook.

questions to be answered and timer. For every question there are four possible answers, of which only one is correct. The timer shows the time left for answering all questions in the test. If the student does not finish the test in the obligatory time limit, he or she gets no points for the lab practice.

Checks of received scores can be made through the ”Gradebook” link on the Navigation frame (Fig. 8). The Information ”Gradebook” frame contains the following information:

- student’s full name
- grades received on preliminary tests
- grades received from lab practice
- grades received from in-term tests
- Final Lab Practice Grade
- Final ”Communications Measurement” Course Grade

IV. Conclusion

In this article we presented an information system for preliminary testing and examination used in the ”Measurements in Communication” course held in the Technical University of Sofia. The computer architecture and the software were presented in detail – the software based on Linux operating system, Apache web server, MySql database, HTML, PHP and JavaScript languages.

The system benefits by:

- offering a lower price: Linux operation system, Apache web server, MySql database, HTML, PHP and JavaScript languages are all open-source software products and therefore for free distribution
- unbiased evaluation: all students are evaluated on identical criteria
- swift data processing and grading: the received results are automatically processed by the software application
- access through the Internet to the application’s resources: every user can obtain information on the grades on lab practice and displayed skills throughout the course.
- Protection of the source code: by using a PHP module the source code of the application is unable to be viewed by the users.
- Different Web browsers to link the Web page of the course may by used: the software program has been test bay Internet Explorer Browser, Netscape Navigator, Mozilla Web Browser, Konqeror Web Browser, Galeon and Opera.

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