Custom developed e-learning application

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Abstract. The *ILearnOnline* application is a valuable tool for helping both students and teachers to gain and share knowledge online, ask questions and get a rapid accurate evaluation. We shall briefly present the way the software works, the main structure of the application and a short comparison with Moodle.

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1 Presenting the software application

There exist numerous software platforms in the field of e-learning software through open source. Most of these developments involve cooperative approaches to the processes of design, distribution, education instructive thus promoting continuity and dynamic knowledge. One of the best known such platform is Moodle (an abbreviation for Modular Object-Oriented Dynamic Learning Environment), a free open-source e-learning software platform, also known as a Virtual Learning Environment (VLE). Moodle comprises: the software, the Moodle community website, an open network for Moodle registered users and the Moodle partner network.

1.1 Application features

The "ILearnOnLine" allows support for instructive education with modern instruments, which amount to the current level of educational systems used throughout the world. Its main features are:

Friendly interface: it is adaptable and varied - depending on the type of user and access rights, which are manageable.

Ease of use: one of the main objectives of the application is to persuade users of the usefulness to deal with a platform for e-Learning, which provided easy to use instruments.

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Low costs: to implement the "ILearnOnLine" application, an organization needs funds only to provide hardware support and the channel of communication. All necessary software can be downloaded freely from the Internet, namely: for the server: Apache, PHP, MySQL, and for the client: any browser (Mozilla Firefox recommended).

Adaptability: - the product is both open source and modular; hence it allows administrators to add or change tools and the display mode of information, to adapt databases, etc.

1.2 The development

The development environment of the application is the PHP language with functions specific to MySQL database, which allows applications to have a customer-based web server.

The design was done in Adobe Photoshop CS, as editor for HTML and PHP was used Namo, and the used database is made in MySQL.

Like our inhouse developed version of IlearnOnline, the main virtual learning platform Moodle, runs without modification on Unix, Linux, Windows and Mac OS X and on any other systems which support PHP and a database, including most webhost providers, while the data goes in a single database.

For example, Moodle version 1.6 can use MySQL, just as ILearnOnline does.

Users can install Moodle from source, but this requires more technical proficiency than other automated approaches, such as: installing from a Debian package, deploying a ready-to-use TurnKey Moodle appliance or using the Bitnami installer.

Our application is also completely browser based; therefore, in order for a teacher or trainer to add new courses while accessing the application, no IT skills and no installed programs are required, providing absolute easiness and portability. Moreover, a teacher or trainer can add courses from anywhere - which gives him considerable flexibility.

Only the system administrator needs to have technical skills in order to customize and configure the application.

Based on these arguments, our application has its definite place in the market, without having the intention to win a large public interest for it, but regarding it as a product that would best fit our the needs and interests of our University, students and teachers, and to provide them means to practice all that they have learned.

1.3 The content of the database

The database contains six tables, each table having different fields:

1. table *counters* - take into account how many times a course has been downloaded;
2. table *courses* - hold the title, content, description, theme and test course, the date and time that has been added;
3. table *groups* - hold the number and the name of the group in which students might be enrolled;
4. table *links* - hold the title of books and links that can be accessed by students in order to complete their knowledge;

5. table *payment* - hold the payment (name on card, card type, card number, address, etc.) and the user who pays when enrolls for a course;
6. table *answers* - hold the tests and the solutions of the students.

On the first page of the application any site-visitor can register (can make a new account) as student. After registering, he may log on the first page; then, further the username and the chosen password allow him to access courses - otherwise the resources cannot be seen.

1.4 Teacher registration

Only the site administrator can create an account for a teacher, as described below. From the Administration page there is entered the admin password. Then, on the first page of the site is chosen the option "New user registration". It has to be emphasized that one can choose the "user" type both for a student (while creating a student account) and for a teacher (account for a teacher).

On the page *Courses*, the access is allowed for all the students, teachers and for the site administrator.

1.5 Teacher authentication

The teacher proceeds to authenticate himself like a regular user. Once he signs in, he will be automatically redirected to the panel of administration, where he can add a new course, view / change courses, delete courses and complete the students' situation.

The webmaster is the only one who can view the accounts created on the site; he can change them for both students and teachers.

Inside each course there exist both options for tests and homework, where students can enter after attending classes and solve the existing exercises corresponding for each course. Therefore students can get their grades online right away from the teachers, in the panel of administration.

There is also a page of links, which can be accessed by registered users, in order to complete the information from the courses.

2 The contents of the application

The application consists of the following windows:

1) the welcome page of the E-learning site; 2) registration page for the new users; 3) registering for new courses; 4) registration form for a new course; 5) home access in the new courses; 6) course page; 7) form reference to the proposed homework of each course; 8) testing form available on-line at the end of each course.

3 Administrator's section

The administrator's section consists of the following windows:

1) administration section available by logging as a teacher; 2) courses administration; 3) form for adding a new course; 4) the present situation of a student and his data

records; 5) the scores of students established by teachers; 6) form confirming the payment 7) administrator's menu; 8) proposed administration for students area; 9) home Links; 10) contact page.

4 Database structure of the application

The following tables describe the basic data structures and their formats[1]

I. Table *users*:

Id$^{\text{Int(11)}}$; User$^{\text{Text}}$; Pass$^{\text{Text}}$; Email$^{\text{Text}}$; Name$^{\text{Text}}$; Day$^{\text{Text}}$; Month$^{\text{Text}}$; Year$^{\text{Text}}$; User-type$^{\text{Text}}$; Group$^{\text{Int(11)}}$; Sex$^{\text{Char}}$; Mailing-list$^{\text{Text}}$; Courses$^{\text{Text}}$; Paid$^{\text{Char}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

II. Table *courses*:

Id$^{\text{Int(11)}}$; Title$^{\text{Text}}$; Duration$^{\text{Text}}$; Description$^{\text{Text}}$; Content$^{\text{Text}}$; Test$^{\text{Text}}$; Homework/Activity$^{\text{Text}}$; Author-id$^{\text{Int(11)}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

III. Table *payments*:

Id$^{\text{Int(11)}}$; Card-holder-name$^{\text{Text}}$; Card-holder-adress$^{\text{Text}}$; Card-type$^{\text{Text}}$; Card-expiration-date$^{\text{Date}}$; Card-serial-number$^{\text{Int(11)}}$; User-id$^{\text{Int(10)}}$; Course-id$^{\text{Int(10)}}$; Confirmed$^{\text{Tinyint(4)}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

IV. Table *counters*:

Downloads$^{\text{Tinyint(4)}}$; Course-id$^{\text{Int(11)}}$; User-id$^{\text{Int(11)}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

V. Table *groups*:

Id$^{\text{Int(11)}}$; Group-name$^{\text{Text}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

VI. Table *links*:

Course-id$^{\text{Int(11)}}$; Title$^{\text{Text}}$; Link$^{\text{Text}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

VII. Table *solution*:

Solution-id$^{\text{Int(11)}}$; Course-id$^{\text{Int(11)}}$; Student-id$^{\text{Int(11)}}$; Solution$^{\text{Text}}$; Type$^{\text{Text}}$; Grade$^{\text{Tinyint(4)}}$; Date$^{\text{Date}}$; Hour$^{\text{Time}}$.

5 Conclusions

What makes our application notable is the fact that it is in-house developed and tailored for the needs of the user; this first version is intended for being used in psycho-pedagogical formation department, a reason for which only a part of features provided by more complex applications (like Moodle) are flexibly implemented; it gives the students the possibility to be involved in the process of developing, testing and debugging this program.

The application was developed by a joined group of students and teachers which used this opportunity for gaining experience and practicing their programming skills.

[1]The upper index denotes the data format.

One of the advantages of *ILearnOnline* over Moodle is the fact that the latter one has no means of telling if the person in front of the computer solving a Moodle quiz/exam is really who he/she claims to be.

In order to avoid that, though our application does not test students in front of the computer, still allows them to read the training materials, perform the compulsory activities, discuss with the virtual teacher and with their colleagues on the forum, but the final examination needs them to be present at the faculty in the examination rooms.

This way the identity of the examined person is verified, and allows the examiner to use - if needed - additional examination procedures.

The flexibility of the program allows it to develop its features, depending on the needs of the university needs and educational/taxonomic considerations.

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