Web Based Application for Registering Degree Projects

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Abstract: The purpose of this paper is to present the web-based application “e-project” accessing a relational database through internet. The tools that have been used to build this application are MySQL as a relational database system for the database design, TCL as a computer language for the development of the application, JavaScript language scripts has been included in source code and HTML for the internet user interface programming. The aim of the application is to provide easy access to the submitted projects and dissertations of the Information Management Department of the Technological Institute of Kavala, Greece to each authorized user. The users are separated to three different groups, the administrator, the professors and the regular users which are the students of the department.

Key-words: Web Based Application, Open Source Software, Degree Projects, TCL, MYSQL, Database

1. Introduction

Web-based application “e-project” is relied on open source software (OSS) which can be modified by changing the source code. The “e-project” has been developed as an internet based application in order to give access to the submitted projects and dissertations of the Information Management department in Technological Institute of Kavala, Greece. Through “e-project” is given the ability to upload the developed applications to all authorized students of the department. The application separates its users to three different groups. The first group and the less functional is “students” having the ability of searching and uploading their own project and thesis. The second group of users is “professors” which have the ability to upload projects and thesis as files to the application database, to edit or delete those entries. Finally, the third group is the “administrator” which has the exclusive privilege to modify or delete all the uploaded files and entries from the database.

As it is mentioned above, “e-project” has been developed with the use of open source software (OSS) tools. The OSS tools that have been used are MySQL for the database part of the application, TCL as the programming language, JavaScript as a designing part of application and HTML for the internet user interface programming. The Operating System in which the OSS tools operate is Unix Solaris 10 installed in a SUN Fire Server.

2. MySQL and Database Architecture

MySQL uses the Structure Query Language standard giving a great deal of control over a relational database system [3]. However, unlike most relational database systems, MySQL is freely available, and because it operates on Unix systems, it integrates very well with scripting languages such as Tcl.

2.1 The Database structure

The database of the “e-project” application is composed of six tables which are illustrated in figure 1.

As it is shown below five tables are linked to the main table ‘degrees’. Since it is the central table, it holds all the appropriate information in relation to each project submitted to the database.
Tables ‘student’ and ‘professors’ are holding information about the students and the professors as username, first name and last name. The table ‘professors’ includes a field ‘id’ which has been set as the primary key of the table and it links to the table ‘degrees’. The table ‘students’ links to the main table through the field ‘rec_num’ which is the record number of each student and it is unique. The table ‘admin’ has three fields, ‘username’, ‘password’ and ‘status’. The table ‘count’ has been created only to hold an integer number. This number increases each time a new file is uploading on the database. The names of the files which are uploaded to the database are changing to the standard “file + the number from the table count”. This prevents of using same field name in the database. Finally, the last table ‘recycle’ has the same fields with the main table ‘degrees’ and the reason of its existence is to hold all the degree papers which are being deleted by the professors as a security measure. This helps the professors to restore if it is necessary the files which have been deleted.

3. TCL and CGI Scripts
One of the most open source scripting languages is TCL (Tool Command Language) which can control and extend applications. It provides generic programming facilities that are useful for a variety of applications, such as variables, loops and procedures. Furthermore, its interpreter is implemented as a library of C procedures that can be easily incorporated into applications, where each application can extend the core Tcl features with additional commands specific to that application [2].

As a scripting language, Tcl is similar to other UNIX shell languages such as the Bourne Shell, the C Shell, the Korn Shell and Perl. Shell programs permit the execution of other programs and provide enough programmability (variables, control flow, procedures) building up complex scripts that assemble existing programs into a new tool tailored to developers needs [1].

An additional benefit of using a scripting language such as Tcl, in conjunction with a relational database such as MySQL, is the notable compatibility of these tools. MySQL offers the advantage of being used and queried using Tcl. CGI scripts that make the application “e-project” searchable and editable from the WWW (World Wide Web) have been developed.

The first script of the applications “e-project” is the ‘login’ script which is responsible to verify the user that tries to login to the application if it is a valid user. The Tcl script through the Tcl shell executes an internal UNIX command in order to confirm that the given username and password exists on the UNIX Operating System. After successful authentication the next script takes over the next application state. Searching through...
database, insertion of a new entry, editing or deleting an entry are executing by several scripts which are going to be illustrated in the following section.

4. Description of “e-project”

The description of the user interface will be held on this section, with emphasis on the features relevant to the structure of the database. First of all, before getting access to the application all users are separated to three different groups. The first group and the less functional is “students” which has the ability to perform the selective search to the e-project database and to download a desired thesis. The second and the most important feature is that students have to upload their own electronic applications using e-project before it is presented to the degree project committee that have been assigned. Students don’t have the permission to modify or delete the uploaded project. The second users group is “professors” which have the ability to upload projects as files to the application database, to edit or even delete them. All files that has been deleted from a professor are sent to professors’ personal recycle bin, in order to be retrieved in case they deleted by mistake. Permanent deletion can be performed if it is desired from the professor. Finally, the third group is the “administrator” which has the exclusive privilege to modify or delete all the uploaded files that the professors have made. “Administrator” can also upload files on behalf of a professor.

4.1 Search

All users of the application have access to this feature. They can perform a general search, (leaving all criteria empty and the date criteria in default set) where the outcome of the search would be a report of all the entries stored in the database or a selective search. Four criteria can be set to the selective search as illustrated in figure (2). The first criterion is the title of the project. The second criterion that can be set is the submission date of the dissertation. The structure of the date that users can set should be a period e.g. from 01/01/2000 to 01/01/2007. The third criterion is the departmental section that the project is more relevant (Computer Science or Economics/Management). In case a user leaves this criterion empty, the results will refer to both sections. The last criterion is the supervisor’s name of the project.

4.2 Insert / Upload

All the professors of the department have the ability to upload files (projects) to the e-project database with all elements e.g. the mark of the project. The fields that should be filled in order a new entry to be properly created are shown below in figure (4). As it is shown in figure 4 there are eight fields that has to be filled in for a new entry. The first one is the title of the project which is going to be uploaded. The next field is the student’s full name which the professors have to select from a list. The third one is the presentation date that the project has been presented to the
examiners. The next two fields (forth and fifth) are the second markers professors for the particular project who examined the student. In the sixth field, three marks have to be set, each for every project examiner in three boxes. At the next field (the seventh) the departmental section has to be denoted for the submitted project (Computer Science or Economics/Management). The last field the has to be set is file of the project thesis which should be browsed and selected. Since all the requested fields are fulfilled, submitting the form a new entry in the database is created and the specified file is uploaded to the server.

Since the above form is submitted by the student the next form that the student has to fill in involves the files of the student’s application that have to be uploaded to the department’s server. This form is separated in two types of files. The first type includes files like html files which will be uploaded to the public_html directory and the second includes script files which will be uploaded to the cgi-bin directory. Figure (6) shows the form of those files that has been described above.

**Figure (6) - Files Upload**

4.3 Edit files

The professors and the administrator have access to the editing form. Each professor can edit only the files that have been uploaded, not others. The administrator of the application has the privilege of editing all the files which have been uploaded by the professors. None of the students have the access to this form. Since an entry from the generated report has been chosen a form including all the details of the entry is presented. The structure of this form is similar to the insertion form in which the authorized user can delete or alter all desired fields. In addition selection of a different file to be uploaded can ne performed. Continually an update to the database will occur along with uploading the new file and deleting the old one. This form is shown below in figure 7.
5. Conclusion

Web based application ‘e-project’ is an internet application that is already operative and used by the students of the Information Management Department in Technological Institute of Kavala, Greece along with the Academic Staff of the department. It has been developed as an internet based application in order to give to students of the department access to submitted projects. All projects are uploaded by the professors of the department. The students can obtain through the application any submitted dissertation since they have access to the internet. The same applies for the academic staff, which apart from the previous utility, they can insert a new project entry or edit an existing one over the internet.

The e-project application is built-up using only open source software and that gives the ability of an easier application growth. Certain observations have been made from the users of the application and it is considered to be enclosed to the next version of e-project. This will lead to a much more useful internet application and will urge more people to use it.

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