

A Web-Based Software System for Downloading Extra Documents with Personalized Access in an Intranet Environment

Assoc. Prof. Dr. Julian Vasilev
Department of Informatics
Varna University of Economics
Bulgaria

Abstract

The purpose of this article is to popularize a light web-based software system for downloading extra documents with personalized access in intranet environment. The presented system is developed as a software product which is installed and it is used in Varna University of economics. It is comparatively small, light, compact and user-friendly for installation, usage and administration. The exposition of the article is aimed at promotion of a software product which facilitates the educational process.

Key words: web applications, e-learning, intranet

Introduction

A lot of software products are developed in the sphere of e-learning. Most of them allow personalized access to additional documents, provided by the teacher for voluntary reading. A great deal of e-learning software products are developed by universities. Another group of software products are open source software and they may be downloaded and used for free. A common representative of the last group is Moodle (see www.moodle.org). Almost every university has an intranet software system with personalized access. The development of software technologies nowadays may be characterized with two main tendencies: (1) fragmented usage of different e-learning systems from each person from the academic staff and (2) the use of a global university information system.

The purpose of this article is to popularize a light web-based software system for downloading extra documents with personalized access in intranet environment. The presented system is developed as a software product which is installed and it is used in Varna University of economics (www.ue-varna.bg). The described software product does not extend the functionality of popular e-learning systems. It is comparatively small, light, compact and user-friendly for installation, usage and administration. The exposition of the article is aimed at promotion of a software product which facilitates learning.

1. Description of the software system

The description of a software product usually follows the logic: purpose, structure and functionality. The aim of the developed system is to provide a personalized access to learning materials in various disciplines. The personalized access is provided by entering: group, faculty number and album number. The album number serves as a password. From the perspective of teachers, the system allows: (1) description of subjects, (2) importation of lists of students from the university system and (3) publication of materials on each subject. From students' perspective, the system allows login with group, faculty and album number and downloading published materials.

The integrated development environment – IDE (used for the development of the system) is Delphi (see www.embarcadero.com). The technology IntraWeb (or VCL for the web – see www.atozed.com) for development of web application is used. As a rule the IDE is hidden for the end user. The choice of an IDE has a direct impact on performance, reliability, and mobility of web applications. Some IDEs require considerable time and effort to write a software application. Developers are facilitated in writing their web applications by using ready-made components. The less source code a programmer writes the less number of errors he makes. A tool for debugging web applications is implemented in Delphi. It is called “Web Application Debugger”. Its main purpose is tracing source code for finding bugs.

The programmer may put breakpoints and monitor variables during execution of the source code. The mentioned features of Delphi unambiguously determine our choice for the IDE of the described web application.

Web applications developed in IDE Delphi meet the three criteria (for speed, reliability, and mobility). Web applications are server applications. Our web application is installed on a server. It is accessed by web browsers. We have to mark one restriction. The web application is compiled as an executable file for Windows operations system. It is installed as a Windows service. It cannot be used on a different operation system (such as Linux or macOS). The server application is executed on a server. Thus its performance depends mainly on the RAM memory and the processor (CPU) of the server. If a delay occurs on a client machine (or a client device such as a smart phone or tablet) during its execution, the delay may be due to two reasons: (1) slow network connection or (2) insufficient RAM memory on the client device for loading the web application within the web browser.

In order to clarify the exposition, we will show the architecture of the application (fig. 1). Fig. 1 shows the components of the software system (the described web application), their interactions and the roles of individual users.

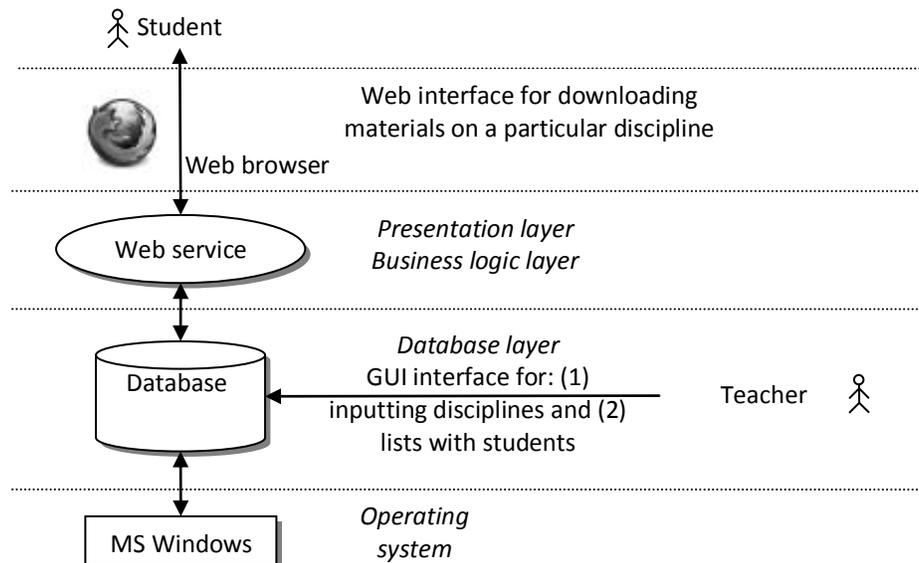


Fig. 1. Architecture of the web bases system

The use of Windows services (in the form of executable files on Windows) guarantees the protection of the source code of the web service by unauthorized changes. The implementation of the software product as a Windows service ensures its fast performance. There is no need for installation of interpreter of dynamic web pages, which is inherent for software applications built with other IDEs (such as PHP, ASP and ASP.NET).

The described web application takes care of releasing the occupied memory, when the end user closes the browser window on the client side. A number of examples are known in the business practice when internet projects fail because web applications block due to the fact that during the development of web applications programmers sometimes forget to release reserved memory for each session. Web applications built in Delphi IDE have automatic mechanism for memory management. If there is an inactivity of the end user for a certain period of time (by default 10 minutes timeout), the web application automatically frees the end-user session (and releases memory on the server).

2. System setup

A configuration file (INI file) is used for setting up the parameters of the software system. The name of the service and the port of the service are described in the file “jsetup.ini” simply by editing it in a text editor (fig. 2).



Fig. 2. Describing the name and the port of the service

The web application may be used to publish materials on different disciplines. The materials are copied in separate folders on the server (where the web application is installed) corresponding to each discipline. For instance files for the discipline “Project management” are copied in folder “PM”, for the discipline “Information logistics” – in folder “IL”.

Disciplines are described directly in a table in the database (table 1).

Table 1. Disciplines

Code_disc	Name_disc
IL	Information logistics
PM	Project management

Lists of students are imported directly from the university information system (table 2).

Table 2. Students

AN	FN	KURS	GR	IME	DISC
82500	9567	4	37	T*** I*** S***	IL
82540	9581	4	37	V*** V*** B***	IL
82568	9591	4	37	Z*** D*** D***	IL

For each student we maintain the discipline he studies. As an example the student with album number 82500 may download materials only for the discipline “Information logistics”.

As it is obvious the database of the system consists of two tables.

The system may be used by different teachers. It may be installed on a separate server for each teacher. A better approach is to install the system several times on one server. In this case, there have to be made separate folders (copies) of the system for each teacher. There is a “jsetup.ini” file in each folder. Each “jsetup.ini” file has to be opened and edited. Services must have unique names and port numbers. It is recommended to use port number greater than 2000 in order not to interfere with port numbers used by the operation system.

3. Login in the software system as a student

As we mentioned, the system allows personalized access (fig. 3)

Please enter:

group:

faculty number:

album number:

Фиг. 3. Login in the system as a student

After login with group, faculty and album number a web form with license agreement appears. The license agreement consists of information that students' materials are just for personal use. Students are not allowed to publish them or sell them. After accepting the license agreement, a new web form is shown – for downloading files for one discipline.

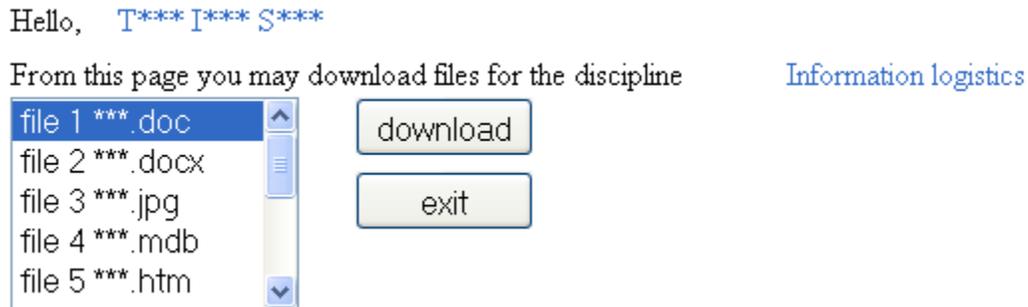


Fig. 4. A web form for downloading additional files concerning the discipline “Information logistics”

The list of files for downloading is generated automatically when a student logs into the software system. If a teacher adds a file, it occurs automatically in the web form for download. It is possible a teacher to upload newer version of files or to delete old or unnecessary files.

Conclusion

The presented software product is designed, implemented, installed and working in Varna University of economics. Its use greatly facilitates the learning process. The processes for installation and updating the database (done by teachers) require minimal time. The system is suitable for use when the teacher does not want published materials to be available in the internet environment. When the teacher wants study materials to be accessible in intranet environment it is recommended to use the described system.

If the system is installed on an internet server, study materials will be accessible in internet (again with personalized access). When a teacher wants to separate study materials by disciplines and students, it is recommended to use the system. Because the system is used by one teacher in one semester, a major disadvantage (restriction) of the software system is the assignment of only one discipline to one student, who can access course materials. The presented restriction is determined by the specificity of the software system. One copy of the system is intended to be used by one teacher, who has lectures and exercises in several disciplines with different students. Such a restriction can be overcome by creating a third table with a composed primary key (album number and discipline) and after further development of the software system.

Literature

www.moodle.org
 www.ue-varna.bg
 www.embarcadero.com
 www.atozed.com