Software Requirements Specification

for

Course Material Archive

Version 1.0 approved

Prepared by

Khadiza Akter (2054901067)

Fabiha Kabir (2054901071)

Fariha Rahman Toha (2054901081)

Tasfia Zaima (205901093)

Bangladesh University of Professionals

10 August 2022

Contents

Chapter 1

1. Introduction

Without an archive the civilization has no memory and no scope to learn from its success and failures. It is important for students to access their course materials so that they can revise the courses they have completed but have lacking and also to study materials ahead for better understandings when the lecturers teach. Also, without an archive lecturers will have to spend more money and time in printing materials which is totally unacceptable in this era of technology. Based on these problems, there came the necessity of a system to alleviate these situations and hence came the need of 'Course Material Archive' software. A course material archive is a form of an electronic archive system with the account on what it archives, which are course materials only. The track of course materials are kept by this archive. The users of this system can upload as well as download course materials depending on their roles in the system. It is a web based software which will serve as a backup to any approved course material of any course in the department and will also give student the ability of having their materials in their phones and other devices with an online connection. Design and Implementation of 'Course Material Archive' software will provide a better archiving system for institutions.

1.1 Purpose

The software for Course Material Archive is developed with the view to make the learning experience of students better as well as a platform for the teachers to easily upload all lecture materials. The software will provide an online environment for course interactions. It will help in planning and delivering educational content to students, automate the process of collecting course materials and enables collaboration among students. Since a large number of students are handled by the teachers, it is not possible to keep track whether all the necessary course material reached them properly. The implementation of course material archive software will make this job easier as the time and cost will be reduced. Moreover, the student will get excess to the necessary lectures slides, questions of previous years, class notes, academic books and other necessary files under a single online web page. The smart functioning of the software helps to reduce the work loads of both students and teachers and ensure ease of excess to necessary course materials.

1.2 Document Conventions

IEEE format is used to write this SRS document. Headings are bold to make the document more readable and attractive. The document is presented in A4 size page. Throughout this document the following conventions were used:

- Times New Roman is used as font
- Main headings are kept a size 14
- Sub Headings are kept a size 13
- Size 12 is used for the rest of the document
- Page align is kept justify
- 1" margin is applied all around the page
- All sections and sub-sections are numbered using the X.X.X... format where X indicates numbers
- Document text is single-spaced and the line spacing is 1.5

1.3 Intended Audience and Reading Suggestions

The software is primarily for the course teachers and students of a certain department. The course teachers will have full authority to create a new course and update existing courses, the students will be able to download materials and also upload new files (upon authentication) are the intended audiences for whom the software is developed. However, this document is intended for individuals directly involved in the development of the 'Course Material Archive' software since it is a technical document. The document is suggested to be read sequentially but readers can jump to any section they find relevant. It will be convenient for the users to use the software effectively if they go through the system features section of this document although the software is kept simple enough to be understood without any prior knowledge on the document.

1.4 Product Scope

The software aims to help the students to get their course materials from the web and also aids the teachers in archiving course materials formulated by them so that the materials are preserved even if lost from their devices. The objective of this software is to allow quick and constant availability of course materials, enable a proper management of course materials in archive, enable quick and easy search of course materials by keywords and finally will reduce the cost in

printing the materials. Given the benefits it can be apprehended that this software has a wide scope in storing and managing the course materials. Though it is developed primarily for a single department but it can be easily customized for all the departments of an institution. More advanced features can be added to make the software capable of managing courses of every departments of an institution.

1.5 References

[1] GitHub. 2022. *Home · Abrar-Sultan/covid-19_help_service_application Wiki*. [online] Available at: <https://github.com/Abrar-Sultan/covid-19_help_service_application/wiki>

[2] Bueteeearchives.net. 2022. *BUET EEE Archives - Home*. [online] Available at: http://bueteeearchives.net/index.php

Chapter 2

2. Overall Description

The course material archive for the department of ICT is a web-based application that was created with the goal of increasing learning efficacy by making study materials and other related resources freely available to students and relevant departmental faculty members. This is a brand-new product; thus, we will create it from scratch. In the section that follows of this article, we'll concentrate on describing the system from the viewpoint of the product, its functions, the user classes and characteristics, design constraints, assumptions and dependencies.

2.1 Product Perspective

The Course Material Archive will serve as a central collection point for course materials, homework tasks, questionnaires from prior years, and other academic files and documents categorized by various courses under their associated faculties. Additionally, students will have the option of adding resources and information to the system as they see fit. This product is designed to help students and teachers by creating a learning environment that will enable them to consistently acquire study resources as needed and contribute to improving the learning environment. This is a self-contained product concept aimed at easy sharing and availability of resources to aid learning by making study resources available for pertinent people without charge under the same department of our university throughout time.
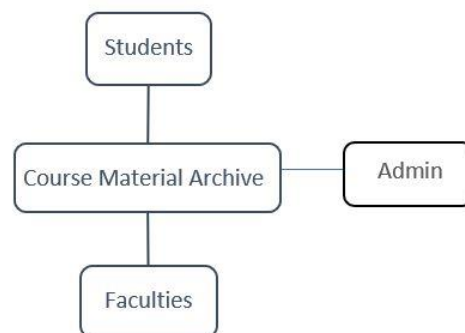
2.2 Product Functions

Fig.2.1: The major users who perform product functions

The system handles some fundamental file activities like uploading and downloading files, providing users with unique IDs upon account setup, and doing text searches to locate items. Additionally, based on different sorts of users, various types of functions can be carried out in the following ways-

Students

- To access the course materials stored in the course material archive, students can set up an account. They might view and download from here as per necessity.
- They will be able to search for their required materials by typing course name or the teacher's name.

Teachers

- Teachers will be able to add or delete courses from the system. Other than them, none has the authority to do so.
- They will have the option to post or remove files, make them available to students openly or keep them archived secretly, as they see fit.

System Administrators

- System administrators can access, edit, upload and delete files.
- System administrators control and manage all user account information.
- They have the authority to reject or delete any user account upon security threats or any other problems.

2.3 User Classes and Characteristics

There are three different user types in the system:

- Students
- Teachers and
- System Administrators

The main users of a course material archive are students. They are primarily responsible for posting assignments, previous year's questions and answers, various project files, and idea discussion. They are also the ones accessing study resources made available by the faculty.

Teachers serve as primary content administrator for course material archive. They provide learning materials related to their courses there. Additionally, they have the choice to privately share resources with their colleagues while keeping them hidden from student users. This will allow for communication between various teachers of relevant courses, which will help the teaching systems. The only people with the authority to introduce new courses are the teachers.

The course material archive portal is mostly maintained by system administrators. They don't really contribute much to the course content itself, but they spend more time managing the site, monitoring it for mistakes, and resolving problems as they come up. They are also in charge of the system for keeping course materials.

It is expected that the user is familiar with the basics of accessing and utilizing the internet. The user interface of the tech support system must be known to the system administrator.

2.4 Operating Environment

To execute this system, a 64-bit desktop or laptop is a bare minimum requirement. Users of Microsoft's Windows operating system can easily load or visit the website. Windows 7 and all its updated editions are easily able to run this product.

2.5 Design and Implementation Constraints

While using the web-based application, there may be limitations. Both the system's creators and its users may have limitations. The limitations consist of the following:

Maximum database size: The database system's ability to store data is essential to the functionality of the system. Because if the information storage limit is surpassed, more files cannot be uploaded. Since there is a lot of data being transferred or saved, choosing the right data management system will result in effective performance. This should be taken into account when choosing which database to employ.

Internet Connection: The application is also limited by the Internet connection. It is essential that there be an Internet connection for the application to run because it retrieves data from the database via the Internet.

Web-based Product: Being a web-based program, it needs working browsers.

Password Protection: All users must have their own individual ID and password in order to access the archive of online course materials.

Development Time: The project to preserve the course materials must be finished in no more than six months.

Operating System: As per client requests, the created system must be compatible with the widely used Microsoft Windows operating system.

2.6 User Documentation

This document includes a Software Requirement Specification (SRS) for the course materials archive. The SRS's initial draft, which will be used for the extensions, is this one. Utilizing IEEE standards, this document is currently in the development stage. Some user manuals, interactive sessions, and videos explaining user documentation may be created later, once the project is completed.

2.7 Assumptions and Dependencies

All users are assumed to be able to read and write English, be familiar with web browsing, and have access to the internet. As this system primarily relies on the type and version of browser that is installed on the computer, it is advised to use a browser version that supports HTML5. A coordinator known as the system administrator oversees and oversees the system server. One can access it from anywhere. Each user needs a separate username and password to access the course materials archive site. The right operating system, browsers, and text file readers must be installed for the system to function properly.

Chapter 3

3. External Interface Requirement

3.1 USER INTERFACES

Each part of the user interface intends to be as user friendly as possible. The fonts and buttons used will be intended to be very fast and easy to load on web pages. The pages will be kept light in space so that it won't take a long time for the page to load.

Login Interface: There will be an option/button for logging in. Those people that have been given access by the admin can login the page. Teachers and students can login to the page using their ID and password. Admin can make changes in user that can access the site. They will have the authority to control users such as removing a user or adding a new user. If one user enters either her username or password incorrectly then an error message/dialogue box will show in screen. In case a user is not registered yet, he/she can enter the details and register.

Search: The index will be the home page. All the materials available will be managed and stored under specific course name and course teachers respectively. So, course material can be searched via given search box. The user can enter the name of the course or teacher name and all materials will show accordingly.

Categories view: Categories view shows the material/document based on their types. There can also be assignments given by each course teachers, previous year or course questions uploaded by students. Admin can make updates in the page regarding both students and teachers. They can insert new features or remove one.

Control panel:

- Both teachers and students can upload materials and make change to the information they provide.
- But Teachers can make document and materials public or private as they find convenient.
- It is recommended to have one student representative from each batch to have the authority to upload necessary files.
- Admin are in control of giving access to students.

- Integrated Development Environment: Visual Studio Code.

- Database Software: MySQL

3.2 HARDWARE INTERFACES

- Windows.

- A browser which supports CGI, HTML5, JSP & PHP.

- PC or laptop

In case of the device-

Processor: i3-1115G4

RAM: 12 GB or below

HD: 1 TB or below

3.3 SOFTWARE INTERFACES

Following are the software used for the Course Material Archive system.

Software used	Description
OS	We have chosen Windows operating system for its best support and user-friendliness.
Database	We have chosen MySQL to save and store the course teachers and student information. Also, data related to each course.
Development Tool	To implement this project, we have chosen Visual Studio Code where we do downloads of the top language extensions, which provide language "smartness" in the popular open source, cross-platform code editor. We also have decided to use PHP and JSP.
Application	To manage MySQL we need XAMPP application.

3.4 COMMUNICATION INTERFACES

- This project supports all types of web browsers.

- PHP uses session variables to communicate between pages of the website.

- Also, the system should be connected to the internet or LAN.

- The HTPP or HTTPS protocol(s) will be used to facilitate communication between the client and server.

- Email is another communication interface that will be used.

Chapter 4

4. System Features

The Course Material Archive software will store course materials online for an adequate period of time. The software will provide the following features.

4.1 Basic System Features:

Log in:

There will be login options for Teachers, students and admin. A comment box will appear each time for system login. The students will have to mention their ID no. each time for access verifications. The teachers will have to give their unique passwords to maintain the security of the system. In this way each individuals will have their own account to avoid any unexpected entry in the system.

Access File:

Both students and teachers will able to view, upload and download files under their specific sections. An extra advantage is given to teachers to keep certain files as private (hidden from other users). This feature will allow the teachers to upload confidential files such as exam questions beforehand but keep it out of reach of the students. So teachers have the option to upload a file with customized privacy settings while the students are only allowed to upload a file publicly.

Creating New Courses:

The teachers will have the full authority to create a new course. Once a file is created all the necessary sections will be automatically generated such as course outline, lecture slides, books, exercises, assignments, previous year questions etc. The teachers and students will then just have to upload files under those sections which makes the work time efficient.

Updating Existing Course:

The Teachers are allowed to update or delete (purging) an existing course as per his/her requirements. A single course can be accessed by multiple faculty members since the courses are being conducted by different instructor on different semesters. It is kept under consideration that

the update made by a certain course teacher does not clash with that of another course teacher. Inconsistencies are corrected if such case arises.

Restoring:

The course contents can be recovered and from an existing blackboard course archive file. The course archive files are originated from secondary storage or the central blackboard archive storage. Similarly, interactions and reviews can be restored as well.

Search Criteria:

To access the materials as quick as possible, a search bar is added at the top. The user can either search the course name, course code or the Course lecturer's name in order to jump to a course section directly. Also by searching by student's name the files uploaded in the system by that particular student will appear in the search bar.

Interactions

The student representatives from each semester can communicate within themselves and with the Teachers. This feature is added so that any integrated decision can be taken and conducted effectively by the students. It will be a great help during launching an event from the department or taking part on any tournament. The teachers will also be able to interact with class representatives of respective batches.

Student's Review

The students are given the scope to write a short review under the course review comment box. Once a course is completed by students, they might mention how the course was helpful to them or what measures can be taken to improve the course. This will allow the authority to take better decisions for next semesters.

Chapter 5

5. Other Non-functional Requirements

5.1. Performance Requirement:

1. The system must accumulate high number of user without any fault.

2. Optimized search engine. Files can be found easily with the course and course teacher's name as keyword.

3. Response to any kind of interaction must take no longer than 3 seconds to appear on screen i.e. minimal connection time.

4. Response time is calculated from the time user performs a specific action and receives enough feedback from it.

5. Typical throughput is required as size and timing both are considered along with traffic.

6. Multiuser application thus, traffic should be maintained.

5.2 Safety Requirements

1. System use shall not cause any harm to users.

2. Model checker is used to explore all the possible paths through model and verify the system.

5.3 Security Requirement:

1. System will use secure database

2. Normal users can just read the index page and about us. But they will not be able to access course materials.

3. Class representative from each batch has the access to add members.

4. System will have various types of users thus constraint is put on every users.

5. Public files cannot be edited unless they are owned by the user. All the users can only read and download public files.

6. Not all users have the feature to choose whether to publish a file with specified privacy.

7. Some users have permission to delete a corrupted or a wrong/invalid file.

5.4 Software Quality Attributes:

Availability: All relevant files should be available when relevant keywords are used to search. Searching specific keyword shall give out details e.g. published date, time, content title and preview.

Correctness: Data accuracy is ensured. Along with students, class representatives have the permission to edit the public files published by students thus they can delete the files if they find anything irrelevant or incorrect.

Usability: Features must satisfy a maximum number of user needs.

Maintainability: Suitable for debugging. Mainly depends on readability and testability feature. An admin centrally handles both database and other interface.

Reusability: Multiple downloads can be done of the same file as well as same file can be uploaded multiple times. Files can also be kept archived or privacy settings can be customized.

Flexibility: Smooth work flow between multiple tabs also a user friendly interface. Also multiple browsers can support this website thus its visibility is not a matter of concern.

Adaptability: Software behavior is monitored centrally as well as it can modify the same according to changes in operational environment or in the system itself. Searching a file which is not in the database will show search results as well as relevant contents as well.

Portability: Can be run on multiple platforms. Application portability and data portability is ensured. Less effort is needed to port the system instead of new implementation.

Robustness: Impact of operational mistake is ensured as well as erroneous input data is restricted.

Efficiency: Maximum time and storage usability is ensured. A flexible user interface along with flexible features are added which reduces time to search relevant topics.

Readability: Program readability is ensured. Also user-friendly interface ensures ease in using this application. Complexity is reduced to certain limits and errors are also handled centrally by an admin which also reduces error probability.

Adequacy: Limited input from user is ensured. To access the application only a specific id is required to login. Flexible data input is ensured.

5.5 Business Rules:

To access database or to upload a file, following information will be recorded:

- Student ID
- Course Teacher's ID
- Date of upload

When a piece of file is removed, then it is completely removed from the database. Following conditions are applied to access the course material archive.

- Must be a student or course teacher of ICT department of Bangladesh University of Professionals.

Others can still visit the website but will not be able to access any course materials.

Appendices

Appendix A

Glossary

SRS: A software requirement specification (SRS) is a description of a software system to be developed. The software requirements specification lays out functional and non-functional requirements, and it may include a set of test cases that describes the model used as well as user interaction that the software must provide.

OS: Operating System (OS) is an interface between computer user and computer hardware. It manages computer hardware, software resources and provides common service for computer programs.