WEB BASED LEARNING ASSESSMENT SYSTEM

BY

MUDATHIR MUKTHAR MUHAMMAD
NAS/STE/20/1054

A PROJECT SUBMITTED TO THE DEPARTMENT
OF
SOFTWARE ENGINEERING AND CYBER SECURITY

COLLEGE OF COMPUTING AND INFORMATION SCIENCE,
AL-QALAM UNIVERSITY KATSINA

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD
OF BACHELOR'S DEGREE
IN
SOFTWARE ENGINEERING

MAY, 2024

CHAPTER FOUR
SYSTEM IMPLEMENTATION

4.0 Introduction

This chapter provides a detailed overview of the implementation process of the Learning Assessment System. It covers the technical tools and technologies utilized in the development, the testing methodologies employed to ensure system functionality, the system requirements necessary for deployment, and the evaluation methods used to gather feedback from stakeholders. This chapter aims to provide a comprehensive understanding of the implementation phase, highlighting the key components that contributed to the successful development and deployment of the Learning Assessment System.

4.1 Technical Tools Used

In The developing of the Learning Assessment System a variety of tools or technologies were used to ensure a flexible functionality, a friendly user interface scalability, and ease of use this tools was selected to meet my systems requirement and enhance the development process. Below is an outline of the main technologies used and their roles:

1. Programming Language: PHP

PHP is a widely-used open-source scripting language that is especially suited for web development. It is embedded within HTML and can be executed on the server side to create dynamic web pages.

Features:

- **Server-Side Scripting:** Handles client requests, manages sessions, and interacts with the database efficiently.
- **Cross-Platform Compatibility:** Runs on various operating systems, including Windows, Linux, and macOS.

2. Database: MySQL

MySQL is a relational database management system (RDBMS) that stores all necessary data, including user information, questions, options, results, and feedback.

Features:

- **Scalability:** Handles large volumes of data and concurrent users efficiently.
- **Complex Queries:** Supports complex queries, indexing, and joins for efficient data retrieval and manipulation.

3. Web Server: Apache

Apache HTTP Server is an open source and a flexible web server that hosts the application and serves web pages on the internet to users.

Features:

- **Security:** Provides robust security features, including authentication, access control, and SSL/TLS support.
- **Customizability:** Offers extensive modules and configuration options for customizing server behavior.
- **Performance:** Efficiently handles multiple client requests and delivers content quickly.

4. Front-end Technologies: HTML, CSS, JavaScript

These technologies form the backbone of the user interface, ensuring that web pages are structured, styled, and interactive.

Features:

- **HTML:** Structures content and elements on web pages.
- **CSS:** Styles web pages to create visually appealing layouts and designs.
- **JavaScript:** Enables dynamic content updates, interactive elements, and client-side validation.

5. Integrated Development Environment (IDE): Visual Studio Code

Visual Studio Code is a powerful IDE that provides a comprehensive environment for coding, debugging, and testing the application.

Features:

- **Syntax Highlighting:** Improves code readability and reduces errors through color-coded syntax.
- **Extensions:** Offers a wide range of extensions and plugins for enhancing development productivity.

- **Integrated Terminal:** Provides a built-in terminal for executing commands and running scripts directly from the IDE.
- **Debugging Tools:** Includes debugging capabilities for identifying and fixing issues in the code.

4.2 System Testing

System testing tests the integration of each module in the system. It also tests to find discrepancies between the system and it's original objective, and current specification. The following table outlines the test cases used to verify the functionality of the Learning Assessment System:

ID	FUNCTION	DESCRIPTION	EXPECTED RESULT	ACTUAL RESULT	STATUS
1.	Sign up	User create new account	New user added to the system	User was added to the system	Successful
2.	User login	User tries to log in with valid credentials	User is successfully logged in	User was successfully logged in	Successful
3.	User login	User tries to log in with invalid credentials	Error message displayed	Error message was displayed	Successful
4.	Take test	User attempts to start a test	Test is successfully initiated	Test was successfully initiated	Successful
5.	View ranking	User attempts to view their rank	Scores and ranks are displayed	Scores were displayed	Successful
6.	View history	User attempts to view history	History is displyed	History was displayed	Successful
7.	Send feedback	User tries to send feedback	Feedback form is displayed	Feedback was sent to admin	Successful
8.	Admin login	Admin tries to login with valid	Admin successfully logs	Admin was successfully	Successful

		credentials	in	logged in	
9.	Admin login	Admin tries to login with invalid credentials	Error message displayed	Error message was displayed	Successful
10.	Add test	Admin adds a new test to the system	New test is added	New test was added to the system	Successful
11.	Delete test	Admin deletes a test in the system	Test is removed	Test was deleted form the system	Successful
12.	View Feedback	Admin attempts to view user feedback	User feedback is displayed	User feedback was displayed	Successful
13.	View users	Admin attempts to view user	List of users is displayed	All users was displayed	Successful
14.	Delete user	Admin tries to delete a user	User is removed	User was removed from the system	Successful
15.	Admin sign out	Admin attempts to sign out	Admin signed out	Admin was signed out	Successful

Table 4.2: Report for System Testing

4.3 System Requirements

The system requirements needed For optimal performance and usage of the Learning Assessment System, both software and hardware requirements are needed. These requirements ensure that the system operates efficiently, providing users with a seamless experience. Below are the detailed software and hardware requirements:

4.3.1 Software Requirements

- **Operating System:** Windows 10 or later, macOS, or Linux
- **Web Browser:** Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari
- **Web Server:** Apache 2.4 or higher
- **PHP:** Version 7.4 or higher
- **Database:** MySQL 5.7 or higher

4.3.2 Hardware Requirements

- **Processor:** Dual-core processor or higher
- **RAM:** Minimum 4 GB
- **Storage:** Minimum 5 GB of available disk space
- **Network:** Reliable internet connection

4.4 System Evaluation

The evaluation of the Learning Assessment System was conducted to determine its effectiveness, usability, and overall satisfaction among its users. The evaluation aimed to gather valuable insights that could guide future improvements and ensure the system meets the needs of its users. This process involved structured feedback collection through surveys and interviews with students, instructors, and administrators.

1. **Students**
    - **Ease of Navigation:** Students generally found the system intuitive and easy to use, allowing them to focus on assessments without technical distractions.
    - **Instant Feedback:** The immediate results and feedback on assessments were highly appreciated, as they helped students understand their performance and areas needing improvement.
2. **Instructors**
    - **Test Management:** Instructors valued the streamlined process for creating and managing tests, which saved them time and effort.

- **Performance Monitoring:** The ability to track and monitor student performance was seen as a significant advantage for providing targeted support.

3. Administrators

- **System Reliability:** Administrators found the system robust and reliable, with minimal downtime and issues, facilitating smooth operations.
- **User Management:** The system's user management capabilities were praised for their efficiency in handling user accounts and permissions.

4.4.1 Overall Evaluation

The feedback received from all users was overwhelmingly positive, indicating that the Learning Assessment System effectively meets user needs and expectations. Key strengths include ease of use, robust functionality, and efficient user management. However, the evaluation also highlighted several areas for future enhancements:

- **User Interface Design:** Improving the visual appeal and responsiveness of the interface to enhance user engagement and accessibility.
- **Advanced Features:** Implementing more sophisticated analytics and reporting tools to provide deeper insights into performance metrics.
- **Security Enhancements:** Strengthening security protocols to safeguard user data and ensure compliance with data protection standards.

The evaluation process provided valuable insights into the strengths and weaknesses of the Learning Assessment System. The feedback gathered will guide future development efforts, ensuring the system continues to evolve and meet the dynamic needs of its users. By addressing the identified areas for improvement, the System can enhance user satisfaction and maintain its position as a reliable and effective tool for learning assessment.

4.5 Chapter Summary

In this chapter, I talked about the implementation details of the Learning Assessment System, highlighting the technical tools and methodologies utilized to ensure a robust and effective application. We explored the various technologies employed, including PHP, MySQL, Apache, and front-end technologies, which

together provided the necessary infrastructure for building a scalable and user-friendly platform.

The system testing section detailed the comprehensive testing approach undertaken to validate the functionality of each component, ensuring that the system operates seamlessly and fulfills its intended purpose. Test results demonstrated successful performance across all key functions, affirming the system's readiness for deployment.

System requirements were outlined to provide clarity on the necessary software and hardware configurations needed for optimal performance, ensuring users have a smooth experience when interacting with the system.

Finally, the system evaluation was conducted through feedback collection from students, instructors, and administrators, offering insights into the system’s effectiveness and areas for improvement. Positive feedback underscored the system’s ease of use, reliability, and robust functionality, while recommendations for enhancements focused on user interface improvements, advanced analytic, and strengthened security measures. The insights gained from testing and evaluation will guide future enhancements, ensuring that the system continues to meet the evolving needs of its users.