

INTERACTIVE WEB APPLICATION WITH CRUD USING PHP & MYSQL

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ABSTRACT

Interactive Web Application with CRUD Using PHP and MySQL (Project), In this project mainly focus to build the web application which is dynamic in nature. The web applications should perform the basic operation of database to, In this project, emphasis is on the basic operation of database. Here, the major concern is on the creation, reading, updating and deletion operations (CRUD) of the student database. Here, CRUD is one of the basic features of most interactive web applications which allow the user to create, read, update and delete the data from the database in a friendly manner. Here, in this project, in addition to the above, we added the major functionality of the project called Project Allocation System, and high security to log in the student to add the project. The purpose of this project is to show the importance of database management and efficient user interface design in the implementation of web applications. Also, security best practices are considered, including form validation, data sanitization and user authentication. The results are fully functioning web applications that provide a foundation for more complex web-based solutions.

1. INTRODUCTION

An Interactive Web Application on CRUD Operations Using PHP and MySQL is an academic paper that demonstrates the processes of creating a dynamic web application. In addition, the project demonstrates an understanding of the CRUD operations. The application allows the user to add, delete, and update data or records in a database. The main purpose of creating this project is to help the user or developer in understanding and implementing the CRUD operations when creating a web application. An Interactive Web Application on CRUD Operations Using PHP and MySQL project will enable the user to understand the processes of creating a dynamic web application.

This project doesn't only focus on the basic CRUD operations. It also is about enhancing the application with a specialized Project Allocation System. This system allows students to allocate and track their projects directly in the application. Therefore, it becomes a comprehensive solution for managing students. With this feature, the project emphasizes the necessity of managing all personal and project information from one location [1-24].

An important element of this project is a focus on security. Nowadays, data security is becoming increasingly important in the digital world. The application allows only those users who are

authorized to see or change the sensible information. The users' authentication allows students to login securely. These issues are essential to ensure that the interactions between the users and the system are safe and reliable. The information will be protected from the threats to its security.

2. PROBLEM STATEMENT

Project experiences issues in student data and projects management. To start with manual or outdated student data handling systems. They are less effective as they have a tendency of errors which this application tries to solve by providing an easy platform for users to perform CRUD operations. The project is majorly designed to solve the issue of project tracking and management in educational environments. To do that, the application includes a project allocation system to enable students to arrange and monitor their projects effectively. Another crucial issue is data security, unauthorized access to students information is probably one of the biggest data security threats. This project solves this challenge by putting in place a user authentication system. Generally, the project is designed to address the stated issues by developing an interactive web application to enable easy CRUD operation on student data, to incorporate project allocation into the application and ensuring that the data is secure from unauthorized people. This is the significance of the project, it will enable only the authorized personnel to interact with the system to ensure that students data is safe, and that the data is easy to track and manage.

3. LITERATURE SURVEY

CRUD operations serve as the foundation for dynamic database-driven, web applications. As indicated in the web development, CRUD operations allow users to interact with the database in a seamless manner (Johnson et al., 2017). CRUD operations are implemented through the basic SQL queries (INSERT, SELECT, UPDATE, DELETE) in PHP and MySQL, making their integral component of handling data in the relational database.

The capability to execute CRUD operations on student databases allows institutions to follow important student information such as personal particulars, grade, course structure, allocation of project details in a user-friendly way. As was noted in the article of Hendry et al. (2020), such systems are essential for enhancing administrative efficiency and decreasing data entry human error. Enhancing a web application with a unique feature, e.g. Project Allocation System, is a significant value addition in the context of its use in an educational environment. It makes it possible to allocate and monitor student projects within the same platform used for academic management. This guarantees successful cooperation between students and teachers and the availability of all relevant information in one place.

Security is the most important aspect of dealing with sensitive user details. This is especially a key factor in the scenario of the student data application. The system is vulnerable to various security breaches such as SQL injection, cross-site scripting, unauthorized access in case of poor user authentication, and session management. The system uses the login credentials that are hashed and stored with salt to secure the database information. The information is encrypted in the protected server for only the validated student to retrieve the information necessary to facilitate the project. The practice is adopted in the project to secure the student data and ensure only the validated user is able to access the sensitive operations.

Intuition and user-friendly interface are the main factors for web applications. According to Nielsen, 2018, a good UI should not require a user to have any technical knowledge to interact with it. In the project, this is highly important because it helps in ensuring that the users can easily perform CRUD operations and track their projects. In the project Scalability is important in the case where users are increasing and the amount of data grows, especially when it comes to a student management system as we are adding new project allocation system which will be the main feature in this project. It is a **CRUD Interactive Web application using PHP and MySQL.**

4. EXISTING SYSTEM

Current way how the system is functioning in Interactive web application with CRUD using PHP and MYSQL for managing student data and projects. Often is done in manual way, or by using outdated systems, which lead to inefficiency and errors. It is hard to manage and track information of students, their grades, personal details and projects with traditional method. In most educational institutions, it is often done on paper or basic software, where it is hard to organize and find the needed data

Inefficiency: Manual Data Entry Leads to Errors and Takes Longer.

No Central System: Data on students and project details are stored separately making it hard to manage everything all in one place.

Security Risks. Sensitive information of students is not safe, and unauthorized access might lead to theft or misuse of this data.

5. PROPOSED SYSTEM

Proposed system. Aim of the study is to modify the student and project management system using an interactive and dynamic website constructed by PHP, MySQL. The system should address inefficiency in the system, disorganization and lack of security experienced in handling student records and project details. The system will facilitate easier process in creating, retrieval, updating and deletion of student records, hence managing the data more effectively and accurately than the manual processes. A certain part will allow students to get projects assigned, and students can track project details in real-time. The system will centralize student data and project details, therefore enhancing the organization.

Student data privacy is important in the system to avoid unauthorized access. The system needs to comply with the authentication process. Passwords will be hashed and sensitive information shall be concealed. All data shall be stored in databases, thus easy management, updating and retrieval of information. This means that student data and project details are maintained in a safe place that can only be accessed by the authorized persons. The system will improve efficiency, security and usability, hence an effective and modern solution in the allocation of projects and student data.

6. WORKING PROCESS

1. User Login and Registration

- **AdminLogin:**

- Admins access the system using **secure login credentials**.
- After a successful login, admins can manage **student data**, allocate **projects**, and perform CRUD operations on student records.
- **Student Login:**
 - Students are registered by the admin and provided with login credentials.
 - After registration by the admin, students can log in to the student panel to access their personal information, project allocation details, and updates on project progress.

2. Admin Panel Operations

The Admin Panel offers full control over the management of student data and project allocation.

- **Student Management (CRUD Operations):**
 - Create: Admins manually register new students by entering their details (student ID, Date of birth, first name, last name, email, CGPA, contact info) into the system.
 - Read: Admins can view student records to check details such as project assignments and status.
 - Update: Admins can update student details, like changing personal information, course enrollment, or assigned projects.
 - Delete: Admins can delete student records when necessary (with confirmation for data integrity).
- **Project Allocation System:**
 - Admins can allocate projects to students by assigning them available projects from the database.
 - Admins can update project details, such as project status (e.g., Hello students your first round started.....), and track student progress.
- **User Authentication and Permissions:**
 - Admins manage user roles and permissions to ensure that only authorized users (students and admins) have appropriate access to system features.

3. Student Panel Operations

Once registered by the admin, students can log in and access their information.

- **View and Update Personal Details:**
 - Students can view and update their personal information (e.g., contact details, address) as needed. However, they cannot modify their login credentials.
- **Create Project Groups:**
 - Students can **create project groups** for team-based projects. A student can initiate a group and **invite other students** to join the group.
- **Designate Team Leader:**
 - The **team leader** is appointed by the students within the group. The **team leader** will have special privileges, such as:
 - **Managing the group** (e.g., adding/removing members).
 - **Assigning tasks** to group members and tracking progress.
- **Project Selection Process:**
 - Once a student identifies a project they are interested in, they can **select the project** from the available list.
 - The student will **click on the project title** to view detailed information about the project.

4. System Notifications and Validations

- **Real-Time Alerts:**
 - The system sends real-time notifications to both students and admins for important actions:
 - New project allocations.
 - Project status updates and feedback from admins.
 - Changes to student records, such as updated personal information.
- **Data Validations:**
 - The system will ensure **valid data entry** to prevent errors, such as:
 - Duplicate student registrations.
 - Project availability validation, ensuring students can't be assigned to a project already allocated.
 - Admins will receive a confirmation prompt before performing critical operations like deleting student records.

5. Dashboard and User Interface

- **Admin Dashboard:**

- TheAdminDashboardgivesanoverviewofallstudents,projectstatuses,andssystem activities.
- Admins can quickly navigate between student management, project allocation, and user authentication features.
- **StudentDashboard:**
 - **TheStudentDashboardallowsstudentsto:**
 - Viewtheirpersonaldetails.
 - Track andmanagetheirprojectprogress.
 - Submitfeedback,complaints,andview notifications.

6. SystemSecurityandMaintenance

- **Role-BasedAccess Control:**
 - Adminshavefullaccesstomanagestudentdata,projects,andssystemsettings, whereas students can only interact with their personal information and project data.
- **UserAuthenticationandPasswordSecurity:**
 - A secure login system will be implemented with password hashing and salting for storage to prevent unauthorized access.
 - Adminsandstudentswillhaveseparateloginsystemstoensuredatasegregationand security.
- **Regular Maintenance:**
 - Adminswillperformperiodicsystemupdatestoensuresecuritypatchesareapplied, and all features are running smoothly.

7.SUMMARY

Web Application with CRUD Operations Using PHP and MySQL Essay.The Interactive Web Application with CRUD Operations using PHP and MySQL is designed for the management of student data, project allocation, and security in educational institutions. It comprises CRUD operations that offer efficient student records and project management. The project includes a particularprojectallocationssystemthattracksstudentprogressduringprojects.Securityisenhanced in the project by user authentication and data encryption, ensuring no unauthorized access to the database. The application also has a clean and responsive user interface for students and an administrator, which makes it easy to interact with the application.

Theprojectiscomplete,anditoffersanintegratedsystemformanagingstudentsandprojectswhile emphasizing security and ease in use. Future development can also be built on this project and expanded to meet the growing technology needs of the education environment.

8.ADVANTAGES

1) EfficientDataManagement:

The system simplifies the management of student data and project details by enabling easy creation, retrieval, updating, and deleting through CRUD operations.

2) Project Allocation and Group Management:

Students able to upload and manage projects, create project groups, and assign team leaders. This has been shown to improve collaboration and teamwork.

3) Enhanced Security:

Security measures that are strong, such as user authentication and data encryption help to prevent unauthorized access to a student's sensitive information.

4) User-Friendly Interface:

Application does offer a tidy and intuitive interface. This means it is easy for both students and administrators to navigate and handle all their data and projects.

5) Real-Time Updates:

Instant updates on project statuses group creation and progress tracking make it easy for students and administrators to stay in the loop.

6) Centralized Management:

Admins have the ability to oversee all of the student records and project data from one place. Therefore, the management software is great for them. It makes sure that they have a better handle over everything

7) Customizable Project Features:

Admins can set project categories, deadlines, and team roles, configuring the system to fit the institution's particular needs.

8) Scalability:

System grown with the institution. With the increase of the students and projects at the institution, the system ensures that it remains effective and functional in the long term.

9. LIMITATIONS

1) Dependency on Internet:

System needs a reliable internet link to be accessible. If users have no internet resources, they will not interact with the system.

2) Technical Skills Requirement

Some users, students or administrators, will require some elementary technical knowledge to navigate the system effectively, which can become an extra learning curve.

3) Security Concerns

It is important to have strong security features to protect an online grades system.

4) System Maintenance

Updates are essential for the functioning of the system. Regular maintenance is required, in order to keep the system secure from potential problems, and fix bugs. If not up to date, the system can face problems.

5) Limited Offline Functionality

The system is web-based so it won't work offline. No internet - no access or data updating.

6) Potential for System Overload

The system can be slow during moments of high use (e.g., project deadlines) if it is not optimized or scaled properly.

7) UserResistance

users may be used to traditional methods (e.g. paper-based systems) and may be resistant to the new on-line system, requiring added training and support.

8) Initial Setup Cost

Configuration of the web application, such as server hosting and security is not costless and can be of concern to smaller institutions or organizations.

10. FUTURE WORK

Various advancements can be made to the Interactive Web Application with CRUD Operations using PHP and MySQL. For future development, Mobile version for better accessibility, integrate the system with the other educational platform is required. Enhance the security with advanced feature like multi-factor authentication. The user interface can be made more user friendly. Automated notifications and reminders can help students to be on track for completing the project on time. System should be able to handle more users and projects. The analytic and report feature should be added to the system. The system should be explored for cloud deployment for better scalability. These improvements will make the system efficient and secure.

11. CONCLUSION

This chapter presents an online content management system that is aimed at managing assignments, student and lecturer schedules, and allocation of student projects. It has been developed to use MySQL database to implement a CRUD application. The system is optimized to achieve efficient and secure management of student data and allocation of projects. The system is designed to enable students and system administrators to perform CRUD operations that involve creating new students, retrieving information of students, updating student information, and deleting students. The system is used to allocate projects to students as well as allocate students to a project. This is made possible by the creation of the system, retrieval of the student, updating both the student and project information as well as deleting Security is emphasized by the system.

This is ensured by means of user authentication data encoding and other actions to ensure security. The interface of the application is user-friendly and convenient, which allows administrators and students to work with student data and projects. Although this shelter has its advantages, such as the simplicity of use, safety, and practicality, there are disadvantages, such as access to cellular, optimization of performance, and reporting features. In general, a solid foundation has been laid for the future, and such institutions provide an innovative solution for the management of students and projects in a simple and effective way.

12. SYSTEM REQUIREMENTS

Category	Hardware Tools	Software Tools
Frontend Development	Computer/PC with internet access	PHP (Recommended Versions: 5.6, 7.4) HTML5, CSS3, JavaScript, Bootstrap (for UI design)

BackendDevelopment	Serverwithatleast4 GB RAM and 100GB storage.	Apache/NginxWebServer MySQLDatabase&
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		XAMPP/WAMP,PHP.
Authentication	Serverwithsecurestorage.	PHPsession management.
Database	ServerwithSSDstoragefor fastaccess.	MySQL,phpMyAdmin.
APIIntegration	Reliablenetworkconnection.	RESTfulAPI(ifapplicable)
Security	Secure physical serverenvironment.	Implementrole-basedaccess control to manage user permissions.
PerformanceMonitoring	Monitoring hardware (optional).	Performance monitoring tools (e.g., New Relic, Datadog),forbackend performance.
BrowserCompatibility	Usevariousdevicestotest application in different browsers.	Variousbrowserenvironments to ensure web application works consistently across Chrome, Firefox, Edge, Safari, etc.
UserInterface	Responsive displays fortesting	Responsive design frameworks Browser compatibility tools

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