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Chapter 4: Implementation

4.1 Development Process

The development of the Request New Asset Management System followed a structured and iterative approach, centered on creating an efficient, user-friendly interface for asset request submissions. The project employed Flutter for building a cross-platform interface, while PHP and MySQL handled the backend logic and database management. The use of Dart within Flutter allowed for a modular, scalable design, which facilitated seamless navigation between pages and ensured efficient handling of user input. Development was performed in Android Studio, with an Android emulator used for testing. Agile practices such as sprint-based development and continuous feedback loops allowed for the integration of features incrementally, ensuring high-quality output. Code versioning tools were employed throughout the project to manage updates and collaboration effectively. The development process was driven by a goal to streamline asset requests through a dynamic, user-interactive system that includes customizable forms, drawing capabilities, and robust backend processing.

Requirement Analysis

Identify and document the functional and non-functional requirements of the Request New Asset Management System.

Define the scope and objectives based on user needs and organizational goals.

Technology Selection

Choose Flutter for a cross-platform user interface.

Employ PHP for backend processing and MySQL for database management.

Select Android Studio as the development environment with an Android emulator for testing.

System Design

Develop system architecture, including user interface layout and backend workflow.

Design the database schema for managing asset request data effectively.

Create wireframes and flowcharts to visualize user interactions and data flow.

Development Setup

Configure the development environment by installing required tools (Flutter SDK, Android Studio, PHP, and MySQL).

Establish version control with Git or a similar tool to monitor changes and support collaborative development.

Frontend Development

Build a modular interface using Dart within Flutter for scalability and ease of navigation.

Create user-friendly forms with customizable input fields and drawing capabilities for asset sketches.

Backend Development

Develop the PHP scripts to handle user requests, process data, and communicate with the database.

Incorporate strong error handling and validation mechanisms to ensure data integrity.

Integrate the Flutter frontend with the backend through APIs and HTTP requests.

Database Integration

Design and create MySQL tables for asset request storage, ensuring normalization and efficiency.

Connect the database to the PHP backend scripts to enable CRUD functionality.

Testing and Debugging

Conduct unit tests for individual components and integration tests to validate the entire system's functionality.

Use the Android emulator for real-time testing of the Flutter app across different scenarios.

Collect feedback to identify and fix bugs or usability issues.

Feature Iteration

Apply Agile practices by developing in sprints, integrating features incrementally.

Refine functionalities based on user feedback and test results.

Deployment

Deploy the application for organizational use, ensuring server compatibility and database readiness.

Provide training or documentation for end-users to ensure smooth adoption.

Maintenance and Updates

Monitor system performance and user feedback post-deployment.

Implement periodic updates to enhance features or address issues.

4.2 Modules and Components

The Request New Asset Management System is built around several core modules, each serving a unique purpose to ensure a smooth and effective workflow:

Asset Request Form: This form is the central component, allowing users to submit detailed asset requests. It includes fields for asset descriptions, quantity, location, and other relevant details, designed for intuitive user interaction.

Figure 4.1 : Request New Asset Form - Initial Part

Figure 4.2 : Request New Asset Form - Latter Part

Backend API: The PHP-based backend modules ensure secure transmission of asset data between the frontend and the MySQL database. These scripts handle data validation, submission, and retrieval, forming the bridge between user input and database storage.

User Management: The system supports multiple users by maintaining separate request forms for each session. This functionality allows users to create, view, and modify their asset requests through an easy-to-use interface.

4.3Challenges Encountered

Several challenges were faced during the development of the Request New Asset Management System. One key challenge was ensuring the persistence of user data across multiple pages and form fields, as users often need to input significant amounts of information in different steps. Implementing this required careful handling of state management to maintain form data during navigation. Another issue was related to backend communication, where managing the secure and efficient flow of data between the frontend and PHP/MySQL backend posed difficulties, particularly in ensuring data validation and timely responses. Additionally, designing a responsive and intuitive user interface that balanced a clean layout with the complexity of input fields and dynamic elements required multiple iterations. Ensuring that the user could seamlessly submit requests without facing delays or technical issues in the form completion process required extensive debugging and user testing.

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