

SECP3106 APPLICATION DEVELOPMENT (WBL) SEMESTER 2 2024/2025

INDIVIDUAL TEST: FYP1 SYSTEM PROJECT REPORT

SECTION: 02

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1.0 Introduction

This project report documents the design and development of the FYP1 System, a web-based application created to streamline and centralize the administrative and academic workflows of the Final Year Project 1 (FYP1) process. The application provides a platform for five key user roles who are Admin, Student, Supervisor, Evaluator and Committee, to manage the entire proposal lifecycle, from initial student registration and supervisor selection to proposal submission, evaluation and feedback.

Developed according to the specified technical requirements, the system is built on the .NET 9 platform using C#, features a responsive user interface for accessibility across various devices and utilizes an SQL Server database for data persistence. The resulting deliverable is a localhost fully working prototype. In summary, the FYP1 System successfully fulfills its objectives by providing a comprehensive, user-friendly solution that enhances the efficiency and transparency of the FYP1 process for all stakeholders involved.

2.0 Software, Language, Tools, API, Templates Used

2.1 Software

The application is architected as an ASP.NET Core Web Application built upon the .NET 9 Software Development Kit (SDK). For data persistence, the system utilizes a developer-focused instance of Microsoft SQL Server (localdb), providing a lightweight yet powerful database environment suitable for a prototype system.

2.2 Programming Language(s)

The entire backend logic, including controllers, data models and business services, was implemented in C#. The user interface views were dynamically rendered using the Razor templating engine, which seamlessly integrates server-side C# with client-side HTML, CSS and JavaScript. Transact-SQL (T-SQL) was used implicitly by the Object-Relational Mapper (ORM) for all database operations.

2.3 Development Tools & IDE

The primary development environment was Microsoft Visual Studio, which provided a comprehensive suite of tools for coding, debugging and project management. The dotnet Command-Line Interface (CLI) was leveraged for core tasks such as running the application and managing database migrations. Entity Framework (EF) Core tools were essential for implementing the code-first database approach and handling all schema migrations.

2.4 Database

The system's data layer is powered by Microsoft SQL Server (localdb), with the connection configured in the appsettings.json file. Database schema and table management were handled programmatically using Entity Framework Core Migrations. This code-first approach ensures that the database structure is version-controlled alongside the application source code.

2.5 Frameworks/Libraries

The project is built on robust and industry-standard frameworks and libraries.

• ASP.NET Core MVC

The core framework provides the Model-View-Controller (MVC) architectural pattern, which ensures a structured, testable and maintainable application.

• Entity Framework Core

The high-performance, cross-platform Object-Relational Mapper (ORM) used to abstract all database interactions into C# objects.

• ASP.NET Core Identity

A complete framework that provided the solution for user authentication and role-based authorization, with its UI components scaffolded via Microsoft.AspNetCore.Identity.UI.

Bootstrap 5

The responsive, mobile-first CSS framework used to ensure a consistent and modern user interface across all devices.

jQuery

A versatile JavaScript library utilized for enhancing client-side interactivity, event handling and DOM manipulation.

2.6 APIs Used

The FYP1 System does not consume any third-party or external web APIs. All functionality is handled internally by leveraging the rich APIs provided by the chosen frameworks, primarily the ASP.NET Core Identity API for managing user accounts and roles, and the Entity Framework Core API for all data manipulation and querying operations.

2.7 Project Templates Used

The project's foundational structure was generated from the standard ASP.NET Core Web App (Model-View-Controller) template in Visual Studio. To expedite the implementation of security features, the ASP.NET Core Identity Scaffolding tool was used to generate the necessary UI pages and backend logic for user registration, login and account management. This template also provided the default integration of Bootstrap 5 for styling.

3.0 Development Steps

The development of the FYP1 System was executed through a structured, iterative methodology, breaking the project into distinct phases to ensure all requirements were met systematically. This approach enabled organized progress from initial planning through to final deployment.

3.1 Phase 1: Planning and Design

The project began with a thorough analysis of the requirements outlined in the project brief. The initial step involved designing the database schema, which included defining all necessary entities (such as Users, Lecturers and Proposals), their attributes and the relationships between them. This conceptual model was captured in an Entity-Relationship Diagram (ERD). Concurrently, the project was structured in Visual Studio using the ASP.NET Core MVC template with integrated ASP.NET Core Identity. This established the foundational architecture and security framework.

3.2 Phase 2: Backend Development

Upon completion of the design, development focused on the application's backend. C# model classes were created to represent the database entities and the DbContext was configured for Entity Framework Core, bridging the application logic and the database. The security model was implemented by defining the five distinct user roles (Admin, Student, Supervisor, Evaluator, Committee) and securing application controllers and actions with authorization attributes. Following this, the core business logic for each role's functionality was developed, including CRUD operations for administrative tasks, the proposal submission workflow for students and the evaluation assignment logic for the committee.

3.3 Phase 3: Frontend Development & UI

The next step was to concentrate on the user-facing aspects of the system. Razor views (.cshtml files) were created for each required function, providing intuitive interfaces for each user role. The responsive design requirement was met by using the Bootstrap 5 framework, particularly its grid system and pre-styled components. This ensures a consistent and accessible user experience. JavaScript and jQuery were utilized to add client-side validation and enhance user interactivity where needed.

3.4 Phase 4: Testing and Refinement

Testing was conducted continuously throughout all phases of development. As each feature was completed, it underwent component-level testing to verify its individual functionality. This was followed by end-to-end workflow testing, where user journeys were simulated to ensure data integrity and correct process flow. For example, tracking a proposal from submission by a student, through review and assignment, to final evaluation. This phase was crucial for identifying and resolving bugs, refining the user experience and validating that all business rules, such as preventing a supervisor from evaluating their own student's proposal, were correctly enforced.

3.5 Phase 5: Documentation

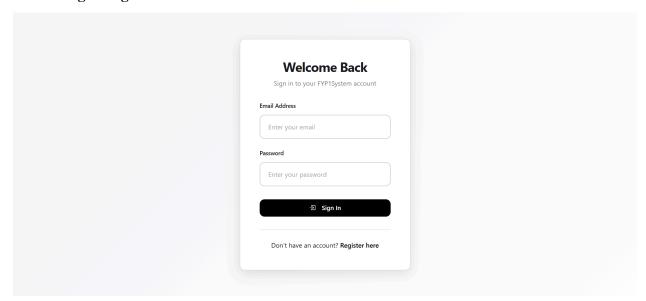
In the final phase, the codebase was cleaned to remove unused files and dependencies to ensure the final package size was minimized to meet the 20MB requirement. The detailed localhost installation steps were written and verified. Finally, this project report and the accompanying Software Design Document (SDD) were compiled to provide a complete overview of the system's functionality, design and implementation process.

4.0 System Interface for All Users

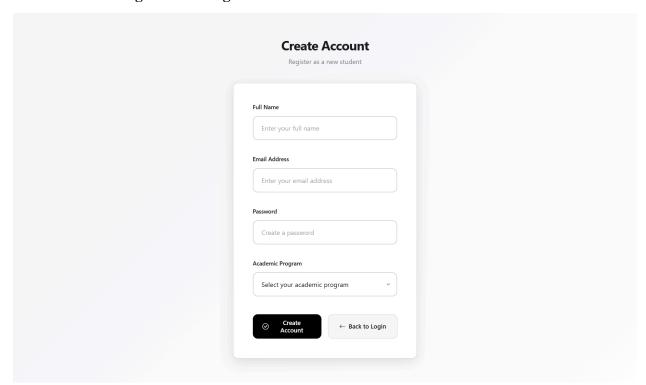
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4.1 Public & General Interfaces

4.1.1 Login Page

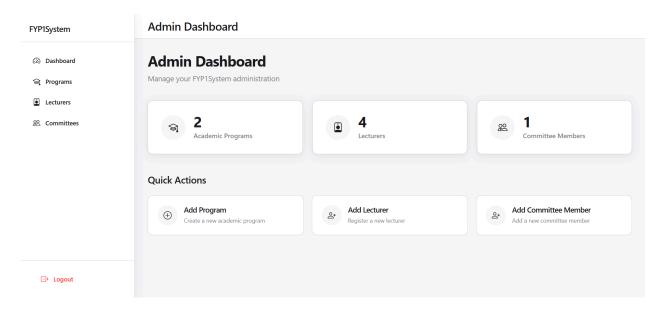


4.1.2 Student Registration Page

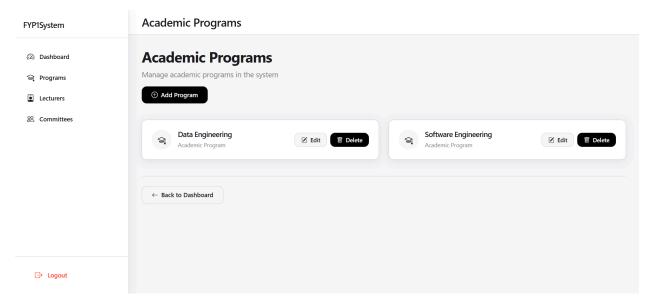


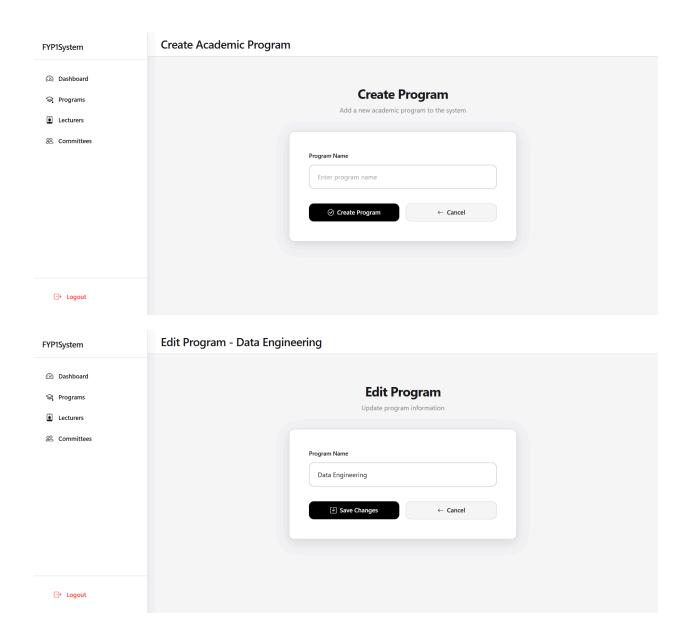
4.2 Admin Interface

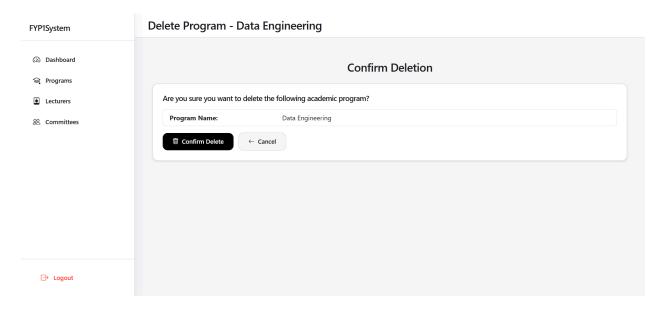
4.2.1 Admin Dashboard



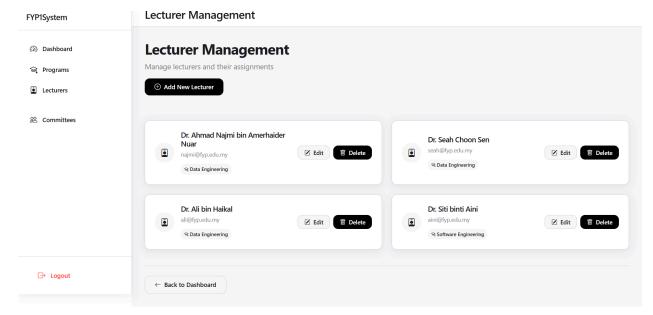
4.2.2 Academic Program Management Page

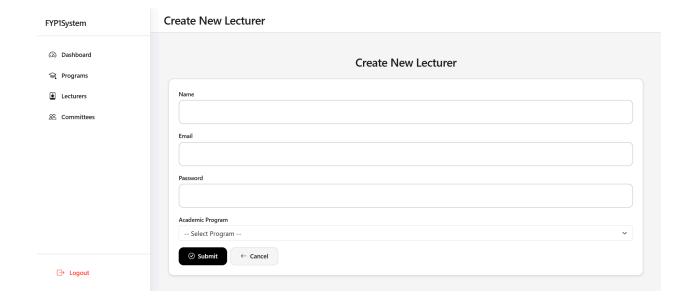


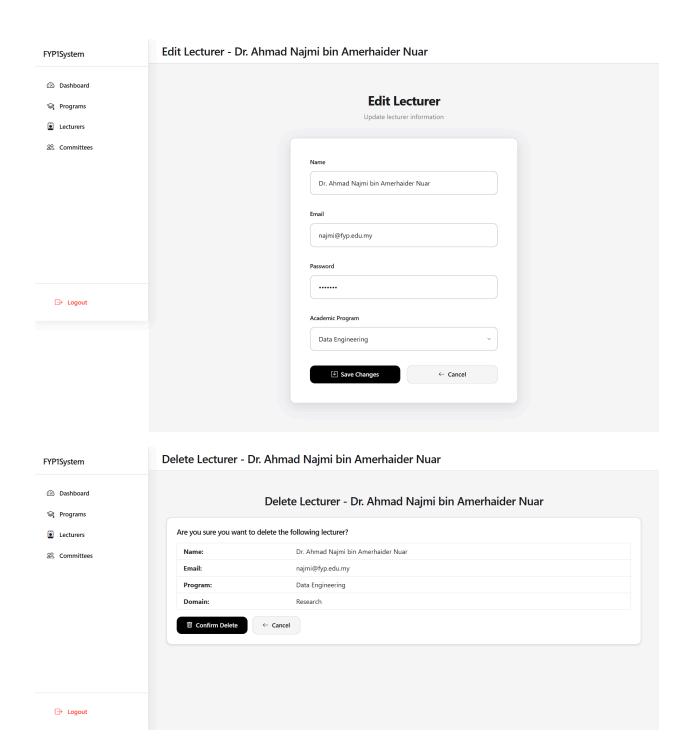




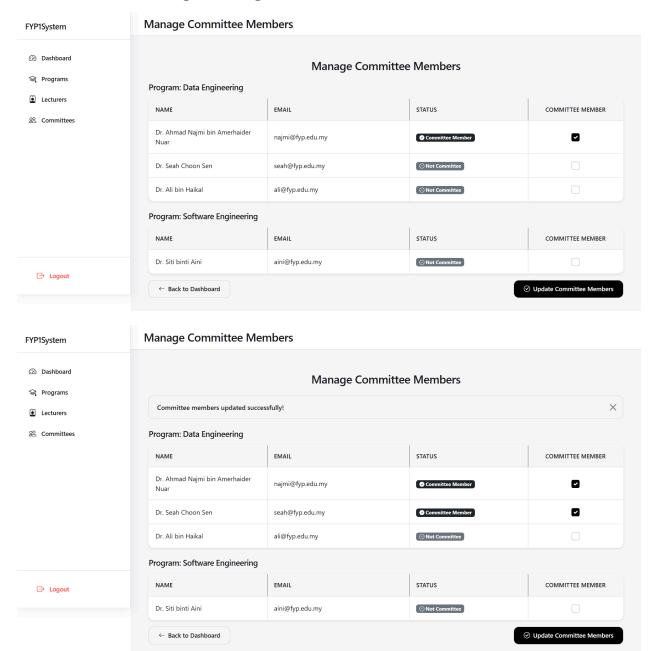
4.2.3 Lecturer Management Page





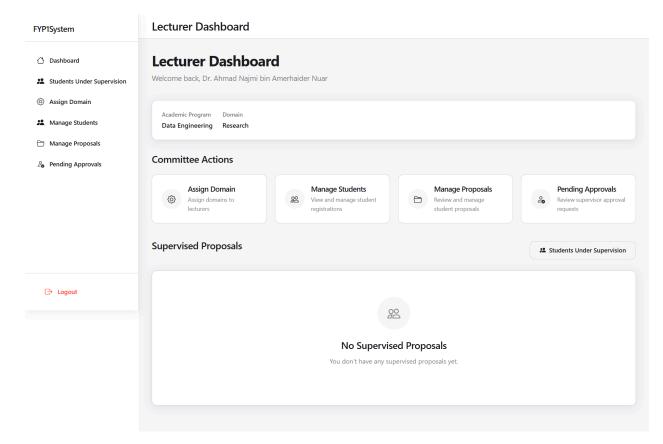


4.2.4 Committee Management Page

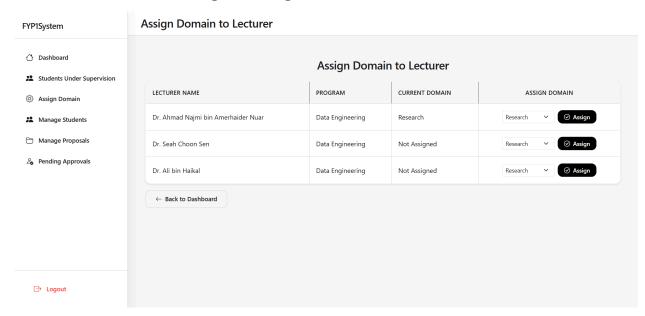


4.3 Committee Interface

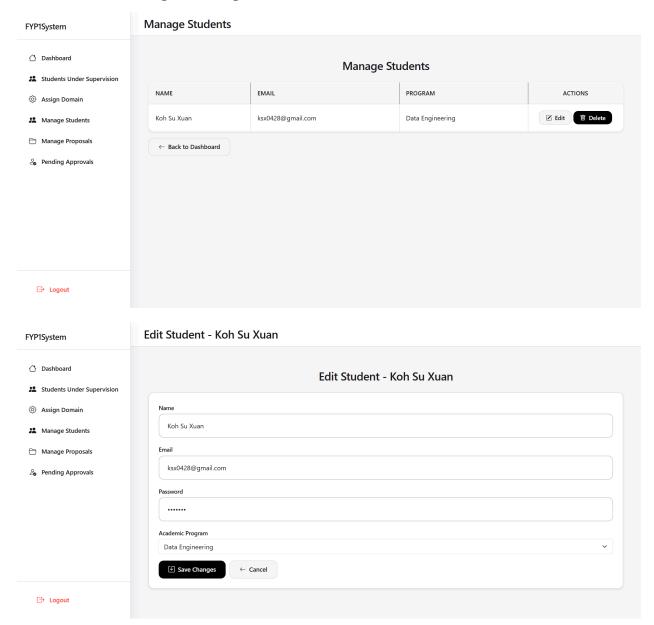
4.3.1 Committee Dashboard

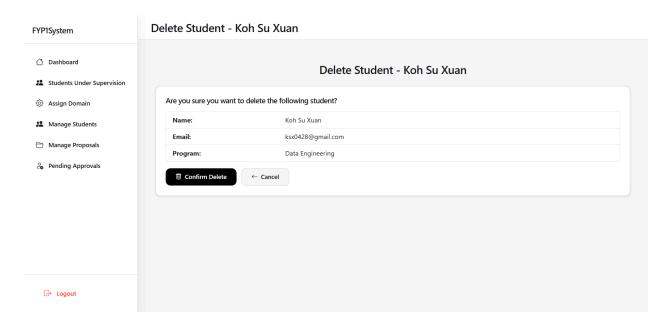


4.3.2 Lecturer Domain Assignment Page



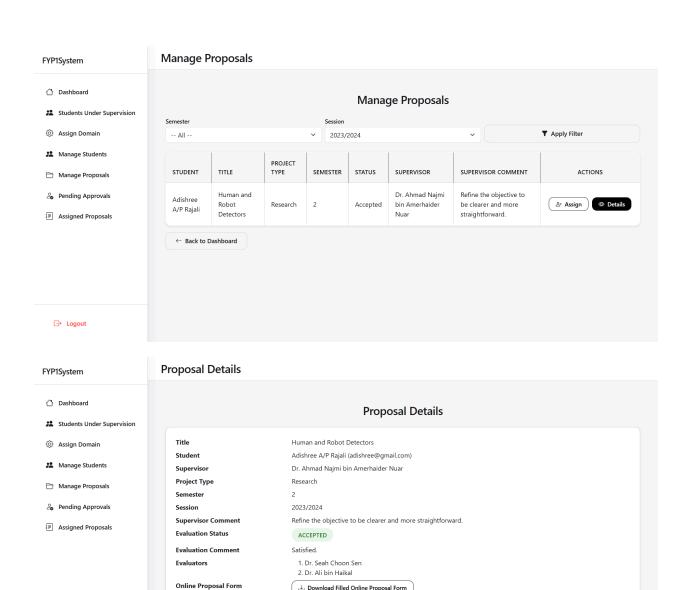
4.3.3 Student Management Page





4.3.4 Proposal Management Page



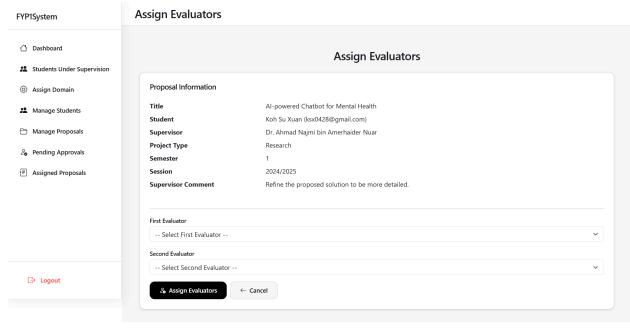


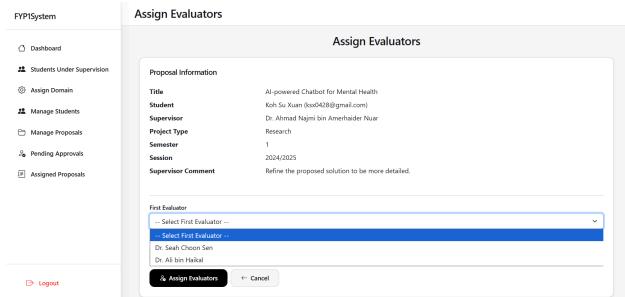
□ Download Submitted Proposal Document

Proposal Document

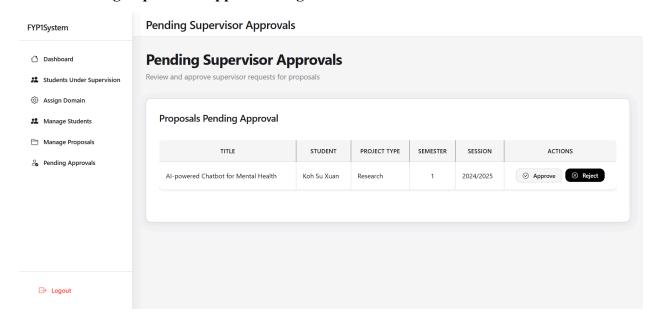
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4.3.5 Evaluator Assignment Page



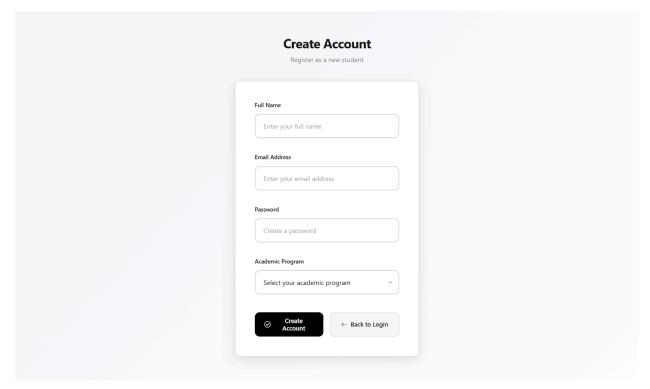


4.3.6 Pending Supervisor Approvals Page

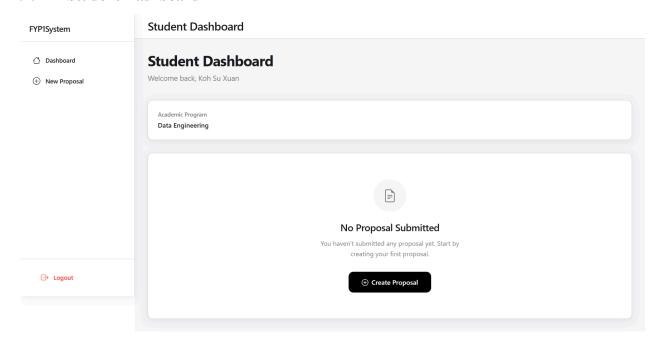


4.4 Student Interface

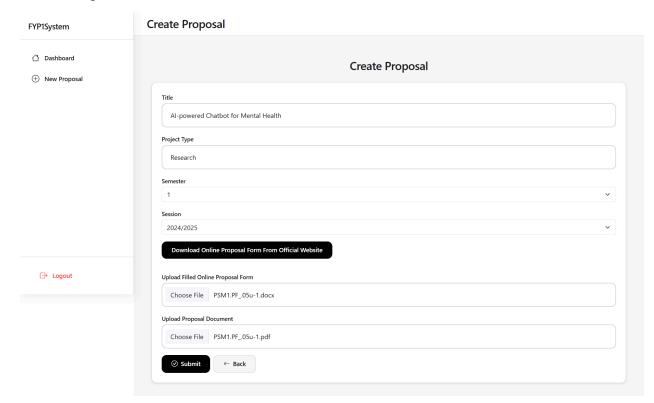
4.4.1 Student Registration Page



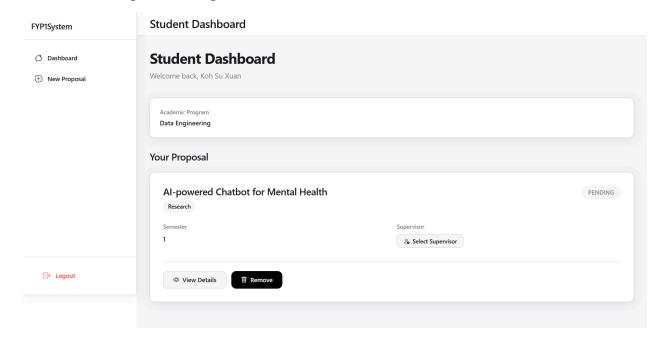
4.4.2 Student Dashboard

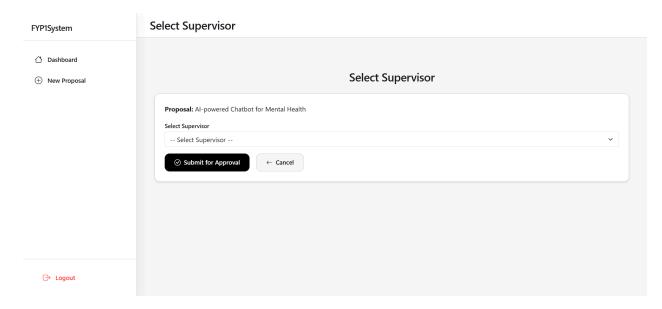


4.4.3 Proposal Submission Interface

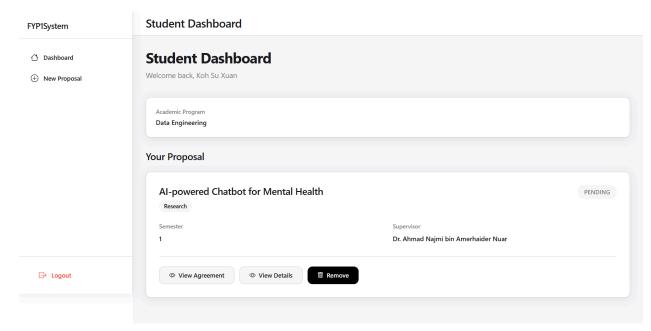


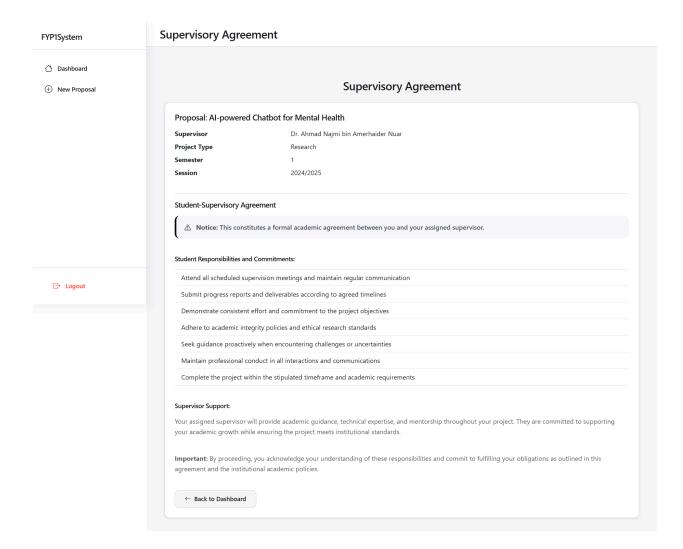
4.4.4 Select Supervisor Page





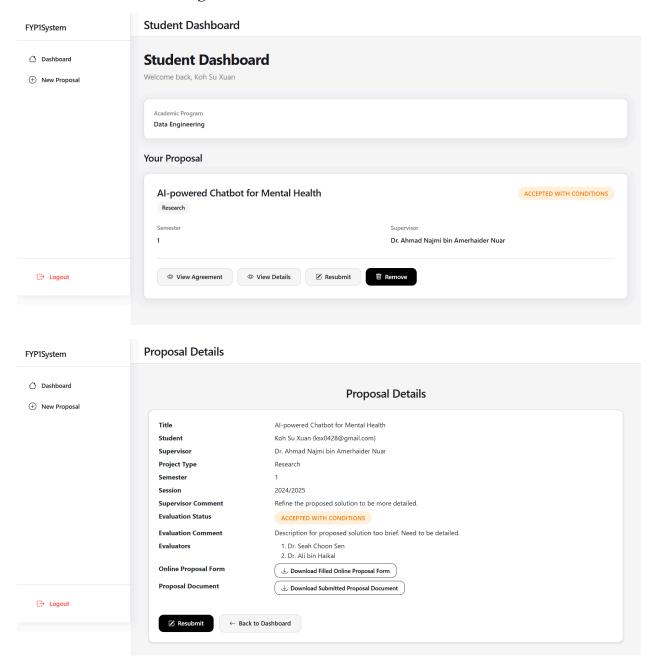
4.4.5 Proposal Agreement Page



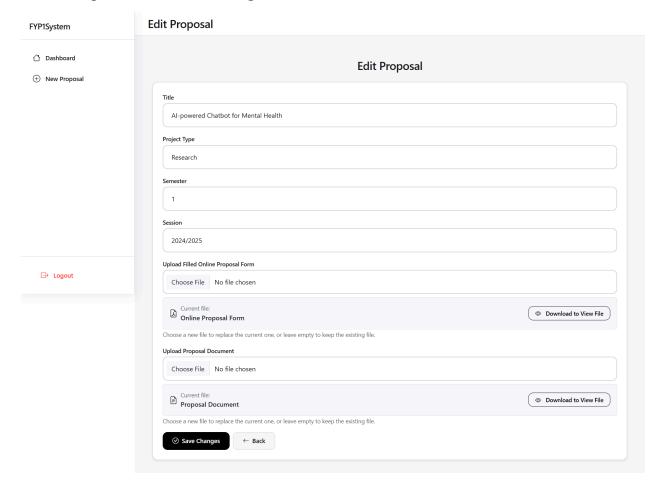


Supervisory Agreement FYP1System **Supervisory Agreement** Students Under Supervision Assign Domain Proposal: Al-powered Chatbot for Mental Health Manage Students Supervisor Dr. Ahmad Najmi bin Amerhaider Nuar Project Type Research Manage Proposals Pending Approvals Session 2024/2025 Supervisory Agreement and Responsibilities (i) Important: By accepting this supervisory role, you are entering into a formal academic commitment. Provide comprehensive academic guidance and mentorship throughout the project duration Conduct regular supervision meetings (minimum bi-weekly) to monitor student progress □ Logout Review and provide constructive feedback on project deliverables within 7 working days Ensure adherence to academic standards, ethical guidelines, and institutional policies Support the student in developing research methodology and technical competencies Facilitate access to necessary resources and research facilities Participate in formal assessment and evaluation processes as required Professional Commitment: This supervisory agreement constitutes a professional commitment to maintain the highest standards of academic supervision. The supervisor acknowledges responsibility for guiding the student toward successful project completion while fostering independent research capabilities and critical thinking skills. Duration: This agreement remains in effect for the entire duration of the project as specified in the academic calendar, unless formally terminated through proper institutional procedures. ← Back to Dashboard

4.4.6 View Evaluation Page

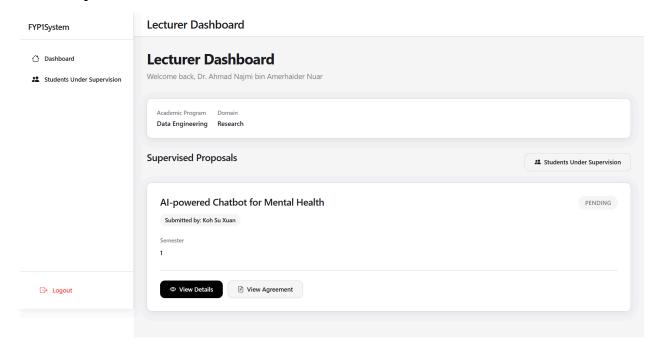


4.4.7 Proposal Resubmission Page

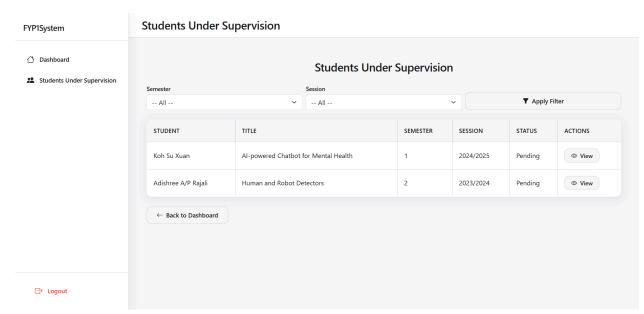


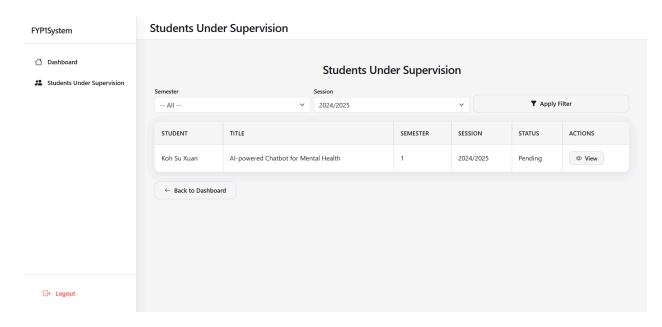
4.5 Supervisor Interface

4.5.1 Supervisor Dashboard

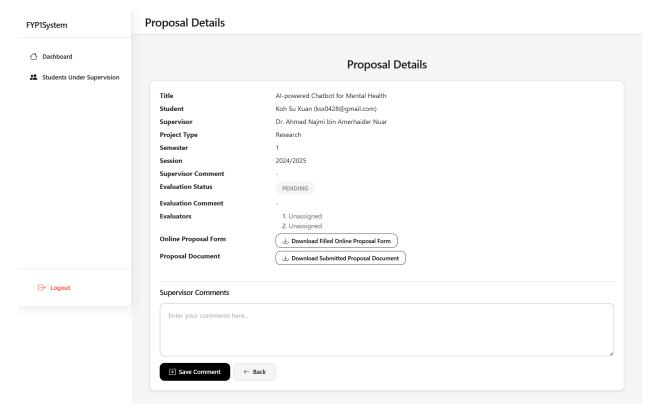


4.5.2 View Own Students Based on Semester and Academic Session

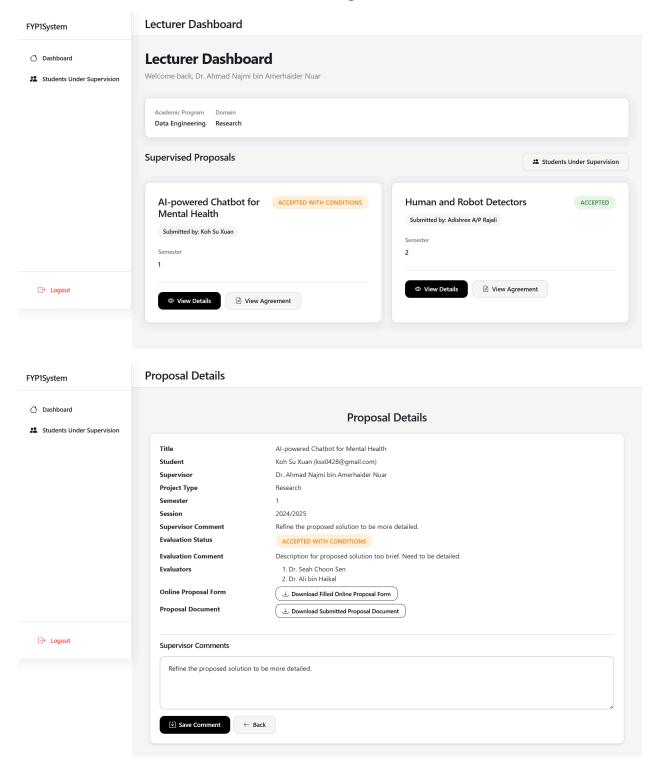




4.5.3 Proposal View & Comment Page

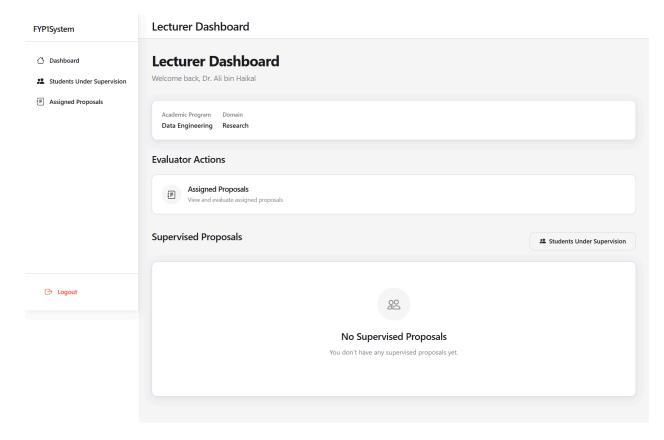


4.5.4 Evaluation Results & Comments View Page

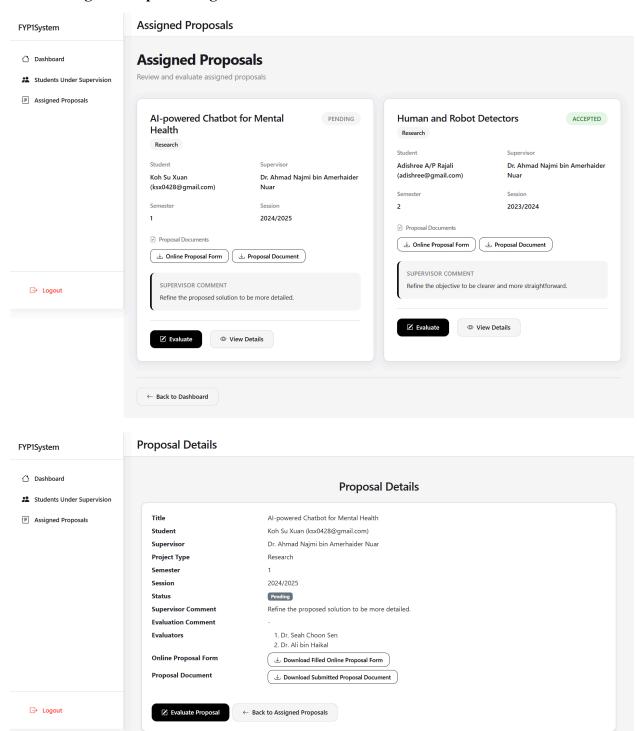


4.6 Evaluator Interface

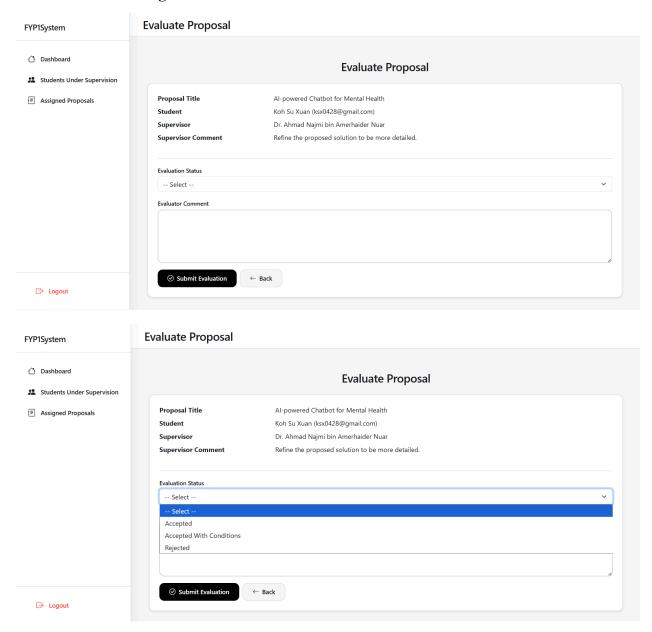
4.6.1 Evaluator Dashboard



4.6.2 Assigned Proposals Page



4.6.3 Evaluation Page



5.0 Localhost Installation Steps

5.1 Prerequisites

Before proceeding, it is necessary to ensure the following software is installed on the local machine.

.NET 9 SDK

The runtime and build tools required for the application.

• Visual Studio 2022

The recommended IDE, with the "ASP.NET and web development" workload installed.

Microsoft SQL Server

An active instance is required. The system is preconfigured to use the (localdb)\mssqllocaldb instance, typically installed with Visual Studio.

5.2 Project Setup

This stage involves preparing the project source code for configuration and execution.

• Extract Project Files

Uncompress the submitted project archive (FYP1System_KohSuXuan_A22EC0060.zip) to a suitable directory.

• Open the Solution

Launch Visual Studio 2022 and open the solution file (FYP1System.sln) from the extracted directory. Visual Studio will automatically restore the required NuGet package dependencies upon opening.

5.3 Database Setup

With the project open, the database can now be created and seeded using Entity Framework Core.

1. Verify Connection String

In the Solution Explorer, open the appsettings.json file. Confirm the DefaultConnection string points to the correct local SQL Server instance. The default configuration is designed to work on a standard Visual Studio installation without modification.

2. Create and Seed Database

- a. In Visual Studio, navigate to Tools > NuGet Package Manager > Package
 Manager Console.
- b. Once the console has initialized, execute the following command:

c. This command will connect to SQL Server, create the database, apply the complete table schema and populate it with all initial required data, including user roles and sample accounts.

5.4 Project Execution

The application is now fully configured and ready to be launched.

1. Start the Project

In Visual Studio, press the F5 key or click the green run button in the main toolbar.

2. Access the System

Visual Studio will build the project, start the Kestrel web server and automatically open the default web browser to the application's homepage.

6.0 User Credentials

The following table provides user credentials for testing the distinct functionalities of each user role within the FYP1 System. The system uses email and password for authentication.

Table 6.0: User Credentials

Role	Email	Password	Notes
Admin	admin@fyp.edu.my	admin123	Provides full administrative access to manage academic programs, lecturers and committee members.
Committee	lect1@fyp.edu.my	lect123	Lecturers who can manage student lists and assign evaluators to proposals.
Student	stud@fyp.edu.my	stud123	Registers personal details, selects a supervisor and submits a new proposal.
Supervisor	lect1@fyp.edu.my	lect123	Lecturers who can view assigned students, comment on proposals and view evaluation results.
Evaluator	lect2@fyp.edu.my lect3@fyp.edu.my	lect123	Lecturers who receive and evaluate assigned project proposals based on their domain.

7.0 Documentation: SDD

A Software Design Document (SDD) has been prepared to provide a detailed technical overview of the system's internal design, including key aspects such as the system architectural design, architecture style and rationale, component model, detailed description of components, complete package diagram and their detailed description, data design and data dictionary.

The complete SDD is provided as a separate document within the final project submission zip. For a full technical breakdown of the application's design, please refer to the file named SDD.pdf.