Software Requirements Specification

for

<FYP Management System>

Version 1.0 approved

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1. Introduction

1.1 Purpose

As we embarked on the journey to create the Final Year Project Management System (FYPMS), our purpose was to design and develop a web-based platform that fundamentally transforms the way final year projects (FYP) are managed within the university. This system was born from our collective recognition of the need to streamline the year-long process that requires diligent coordination among groups of students and their supervisors.

Our primary goal for the FYPMS was to harness the latest technologies to enhance efficiency and communication among all parties involved. Traditionally, managing the allocation of projects and the associated administrative tasks manually was not only time-consuming but also prone to errors. We, as a team, were driven by the urgency to modernize this process—making it more agile, less paper-intensive, and reducing the manual effort required.

Our vision was a comprehensive, web-based solution that served as a one-stop portal for all FYP-related activities. By digitizing this process, we aimed to significantly cut down the time taken for various FYP processes and save costs by minimizing the physical paperwork involved. Additionally, it was about optimizing the utilization of manpower, simplifying workflow steps, and ensuring that every stakeholder could contribute effectively.

The FYPMS we developed caters specifically to the FYP 1 phase, focusing on initial project registration, group formation, project supervision, and panel evaluations. We diligently crafted four distinct user interfaces: for the FYP Committee, Panel Members, Project Supervisors, and Students. Each interface was designed to cater to the specific needs of its users, providing functionalities such as user management, project assignment, notification systems, report generation, and much more.

In creating the FYPMS, we also made sure to prioritize security and user-friendliness. The system was built with robust security features to ensure that sensitive information was accessible only to authorized personnel. Each user was provided with a secure login, safeguarding their personal and project information. Moreover, we incorporated an audit trail feature to log every event performed within the system, thereby maintaining a transparent and traceable history of all operations.

This collaborative effort was aimed at delivering a system that not only meets the current needs of the FYP process but also establishes a scalable foundation for future enhancements and developments.

1.2 Document Conventions

Here are a few general conventions for SRS documents:

- ***Prioritization:*** *Typically, if priorities are assigned to higher-level requirements in an SRS, they are inherited by the detailed requirements unless otherwise stated. Each detailed requirement does not necessarily need to have an individually assigned priority if it falls under a higher-level requirement with a defined priority.*

- ***Fonts and Highlighting***: *In the absence of specified conventions, standard practices include using bold text for definitions, italicized text for emphasis, and monospaced font for code snippets or system outputs.*

- ***Requirement Identification:*** *Each requirement is usually labeled with a unique identifier to facilitate easy referencing and discussion.*

- ***Change History***: *If the SRS document is a revision, it often includes a revision history table at the beginning, listing the version number, date, description of changes, and author of the changes.*

- ***Clear Hierarchy:*** *Headings and subheadings are used to structure the document clearly, typically following a decimal numbering system for easy navigation and reference.*

1.3 Intended Audience and Reading Suggestions

As the team tasked with the development of the Final Year Project Management System, we crafted this Software Requirements Specification (SRS) document to serve as a clear and comprehensive guide for various stakeholders involved in the system's lifecycle. The SRS is intended for:

- *Developers: Who will use the document to understand the functional and non-functional requirements, the data models, and the necessary algorithms and integrations required for system implementation.*
- *Project Managers: Who will organize the project plan based on the detailed specifications, ensuring that every requirement is met and the project adheres to the timelines.*
- *Marketing Staff: Who may refer to the features and the system capabilities described in the SRS to develop strategies for promoting the system's adoption within the university.*
- *Users (Students, Faculty Members, and FYP Committee Members): Who will gain insight into how the system will support their activities and the benefits it will bring to their FYP experience.*
- *Testers: Who will derive test cases and scenarios from the requirements to ensure that all system functionalities are verified and validated.*
- *Documentation Writers: Who will use the SRS as a foundation for creating user manuals, help guides, and training materials.*

The rest of the SRS is organized into distinct sections, each tailored to address specific aspects of the system:

1. *Introduction: Providing an overview of the system, its objectives, and the scope, specifically indicating it is designed for FYP 1 phase.*
2. *Overall Description: Detailing the general factors that affect the product and its requirements, including user characteristics and constraints.*
3. *System Features: Enumerating the system functionalities with their respective use cases and the interactions between them.*
4. *External Interface Requirements: Describing how the system interacts with users, hardware, software, and communication interfaces.*
5. *Other Non-Functional Requirements: Outlining performance requirements, safety, security, and quality standards that the system adheres to.*

We suggest the following sequence for reading the document:

- *Start with the **Introduction** for an understanding of the system's purpose and scope.*
- *Proceed to the **Overall Description** to gain context on the FYP process and how the system fits within it.*
- *Developers and testers should focus on the **System Features** and **External Interface Requirements** for a deep dive into system functionalities and interfaces.*
- *Project managers and documentation writers would benefit from reading the entire document to ensure full coverage of the system.*
- *Users can focus on the **System Features** section to understand the functionalities available to them.*
- *Marketing staff may start with the **Introduction** and **Overall Description** to grasp the system's selling points and then look at System Features for feature-specific information.*

This structured approach allows each reader to prioritize sections relevant to their role, ensuring efficient utilization of the information contained within the SRS for the FYPMS.

1.4 Product Scope

Our Final Year Project Management System (FYPMS) is a web-based application designed to simplify and streamline the management of final year projects within our academic institution. Its core purpose is to provide an efficient, user-friendly platform that enhances collaboration, oversight, and communication among students, faculty members, and the Final Year Project (FYP) Committee.

Key Benefits:

- *Efficiency: Reduces the time and effort required in administering FYP processes.*
- *Accuracy: Minimizes manual errors through automated project allocation and evaluation.*
- *Transparency: Offers clear visibility into project statuses, supervisor workloads, and evaluation outcomes.*
- *Cost-effectiveness: Cuts down on paperwork and associated costs by digitizing the process.*

Objectives and Goals:

- *To facilitate seamless registration, group formation, and supervision of FYPs.*
- *To automate the allocation of projects and supervisors, ensuring equitable workload distribution.*
- *To provide an effective communication channel via in-system messaging and notifications.*
- *To enable robust report generation for missing evaluations, supervised FYPs, and grade statistics.*
- *To implement a comprehensive evaluation system for accurate assessment and grading.*

This software aligns with our corporate goal of leveraging technology to foster an environment of academic excellence. By enhancing the FYP experience, we support our broader business strategy of improving educational outcomes and maintaining our institution's reputation for innovation.

For more detailed context on the vision and scope of the FYPMS, please refer to our "Vision and Scope Document," which outlines the projected impact, user demographics, and system limitations in a more granular detail.

1.5 References

1. Pu, F., Jin, Q., Soo, Y. X., & Jiang, J. (2023, April 1). *FYPMS: Final Year Project Management System*. GitHub. https://github.com/pufanyi/FYPMS
2. “FYPMS.” *Pufanyi.github.io*, pufanyi.github.io/FYPMS/. Accessed 7 Apr. 2024.
3. “FYP Management System.” *Fypms.cse.ust.hk*, fypms.cse.ust.hk/2023/. Accessed 7 Apr. 2024.

4. Overall Description

a. Product Perspective

The Final Year Project Management System (FYPMS) being specified in this SRS is a new, self-contained product designed specifically to manage and facilitate the final year project process within the university. It is not a follow-on member of an existing product family nor a replacement for an existing system. Instead, it is a novel solution developed to address the unique challenges associated with administering final year projects, which traditionally have been managed manually or through fragmented systems.

The FYPMS is conceived as a standalone system with the capability to integrate with the university's existing academic and administrative infrastructure. It will interface with the following systems:

- *Academic Record System: To retrieve student records for registration and to post final grades upon project completion.*
- *Authentication System: To verify user credentials and ensure secure access.*
- *Notification System: To facilitate communication with users regarding updates, deadlines, and feedback.*

The FYPMS will streamline several functions that have historically been burdensome due to manual processes, including group formation, project allocation, progress tracking, and evaluation reporting. Its introduction is expected to enhance the efficiency, transparency, and quality of the final year project experience for students and faculty alike.

Within the larger ecosystem of the university's systems, the FYPMS serves a critical role in the academic process by ensuring that the capstone projects are conducted in an orderly and managed environment. The requirements of the larger system—that is, the university's need for efficient and effective management of capstone projects—directly inform the functionality of the FYPMS.
The interfaces between the FYPMS and other university systems will require well-defined API endpoints, secure data exchange protocols, and consistent data formats to ensure seamless integration and data integrity.

b. Product Functions

The FYP Management System that we, as a team of three, developed serves as a centralized platform for the management of final year projects (FYP) within the university. The system streamlines a variety of significant functions:

- *User Management: Fundamental to the system is the management of user accounts for students, faculty, and committee members, ensuring that the right privileges are assigned to the correct roles.*
- *Project Allocation: The system automates the allocation of projects to students and evenly distributes the supervisory workload among faculty members.*
- *Supervisory Workload Management: It monitors and manages the number of projects each supervisor is handling, with a maximum cap to ensure equitable distribution of work.*
- *Notification System: A mechanism to send notifications to supervisors and students about important updates and confirmations is integrated within the system.*
- *Evaluation and Grading: The system facilitates the evaluation of projects by panel members and the subsequent calculation and recording of grades.*
- *Report Generation: Various reports can be generated by the system, such as those tracking missing evaluations or providing statistics on FYP grades and supervisor workloads.*
- *Audit Trail: An audit trail feature maintains a record of all operations performed within the system, adding a layer of security and accountability.*

The system is particularly designed for the FYP 1 phase and does not include functionalities for FYP 2. This focus allows for a tailored approach that meets the specific needs of the initial stages of the FYP process.

c. User Classes and Characteristics

The Final Year Project Management System (FYPMS) is designed to accommodate multiple user classes, each with distinct roles, privileges, and needs within the ecosystem of managing final year projects at the university. The anticipated user classes and their pertinent characteristics are as follows:

FYP Committee Members:

- *Frequency of Use: High*
- *Product Functions Used: User management, project allocation oversight, supervisory workload management, report generation.*
- *Technical Expertise: Moderate to high, given their administrative role.*
- *Security Level: High, as they have access to sensitive data and control over user roles and permissions.*
- *Importance: Very high, as they oversee the entire FYP process and ensure its smooth operation.*

Project Supervisors:

- *Frequency of Use: High during active FYP cycles.*
- *Product Functions Used: Project monitoring, student guidance, evaluation and grading, workload management.*
- *Technical Expertise: Moderate, primarily focused on using the system for oversight and communication.*
- *Security Level: Moderate to high, with access limited to information about their assigned projects and students.*
- *Importance: High, as they directly influence the quality and success of the FYPs.*

Panel Members:

- *Frequency of Use: Varies, primarily around evaluation periods.*
- *Product Functions Used: Accessing project documents, evaluating projects, filling evaluation forms.*
- *Technical Expertise: Low to moderate.*
- *Security Level: Moderate, with access primarily to documents and forms related to evaluation.*
- *Importance: High, as their evaluations are crucial for assessing project quality and student performance.*

Students:

- *Frequency of Use: High, as they progress through their projects.*
- *Product Functions Used: Project registration, submission of reports/documents, viewing evaluations and grades.*
- *Technical Expertise: Low to moderate, with varying degrees of familiarity with web-based systems.*
- *Security Level: Lower, restricted to their project and evaluation information.*
- *Importance: Very high, as the primary users of the system for whom the FYP process is designed.*

Administrative Staff (if applicable):

- *Frequency of Use: Moderate, involved in support tasks.*
- *Product Functions Used: Supporting the FYP committee, data entry, and system maintenance tasks.*
- *Technical Expertise: Moderate.*
- *Security Level: Moderate, with access needed for administrative tasks without visibility into sensitive evaluation data.*
- *Importance: Moderate, as support staff facilitating the smooth operation of the system.*

The most important user classes are the FYP Committee Members and Students, as these groups are respectively responsible for the management and execution of the FYPs. Project Supervisors and Panel Members are also critical, given their direct role in guiding, evaluating, and grading projects. While Administrative Staff play a supportive role, their requirements are less critical to the system's primary function but important for operational support and system maintenance.

Each user class has distinct requirements that the FYPMS must satisfy to ensure an effective and efficient process for managing final year projects. Tailoring the system's features and interfaces to meet these varied needs is essential for the success of the FYPMS.

d. Operating Environment

The Final Year Project Management System (FYPMS) is envisioned to operate in a versatile and technologically diverse educational environment. This setting necessitates the system to be highly adaptable, reliable, and compatible with a range of devices and software ecosystems. Here's an outline of the anticipated environment for the FYPMS:

Hardware Platform:

- *Computers: The system should be accessible on both Windows and macOS computers, ensuring compatibility across commonly used models and configurations in academic settings. This includes laptops and desktops with standard specifications for modern web applications.*

- *Mobile Devices: Support for iOS and Android platforms is crucial to facilitate access on smartphones and tablets, allowing users to interact with the system on-the-go.*

Operating System and Versions:

- *Windows: The system should be compatible with Windows 10 and later versions, ensuring broad accessibility for users on this platform.*

- *macOS: Compatibility with macOS Mojave (10.14) and newer versions will ensure Mac users can access the system without issues.*

- *iOS and Android: The system should offer a responsive web design or dedicated applications for iOS (version 12 and later) and Android (version 9.0 Pie and later) to ensure functionality on mobile devices.*

Other Software Components or Applications:

- *Web Browsers: The FYPMS must be compatible with the latest versions of major web browsers, including Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge. This ensures users can access the system regardless of their preferred browser.*

- *Database Management System: The system will likely interact with a database management system (DBMS) such as MySQL, PostgreSQL, or MongoDB, depending on the chosen back-end technology. Compatibility and efficient interaction with the DBMS are essential for data storage and retrieval.*

- *Authentication Services: If the university employs a centralized authentication system (such as LDAP or OAuth2), the FYPMS must integrate seamlessly with these services for user authentication and management.*

- *Email Systems: Integration with the university's email system for notification services, allowing the system to send automated emails for updates, reminders, and alerts.*

- *Academic Record Systems: The FYPMS needs to coexist and possibly integrate with academic record systems for importing student data and exporting grades, ensuring data consistency across university systems.*

Networking Requirements:

The system should be designed to operate over the university's secure network, supporting both wired and wireless access, and must adhere to the institution's data security and privacy policies.

e. Design and Implementation Constraints

In the development of the Final Year Project Management System (FYPMS), several constraints and limitations must be acknowledged. These boundaries are critical in shaping the development process, dictating the choice of technologies, and influencing design and implementation strategies. Here is a list of such constraints:

Corporate or Regulatory Policies:

- *Data Privacy Regulations: Adherence to the General Data Protection Regulation (GDPR) or similar local regulations to protect personal data of students and faculty.*
- *University Policies: Compliance with university-specific policies regarding digital communication, data sharing, and student information handling.*

Hardware Limitations:

- *Cross-Platform Compatibility: The system must be accessible on a range of devices with varying memory and processing capabilities, including older hardware models.*
- *Network Bandwidth: The system should be optimized for low to moderate bandwidth conditions, considering the network infrastructure within the university.*

Interfaces to Other Applications:

- *Integration with Academic Record Systems: Must interface smoothly with existing academic databases for importing student details and exporting grades.*
- *Email System Integration: Compatibility with the university's email system for sending notifications and communications.*

Specific Technologies, Tools, and Databases:

- *Database Management System (DBMS): The university might mandate the use of a specific DBMS (e.g., MySQL, PostgreSQL) for data storage.*

- *Development Frameworks: Restrictions or preferences for certain development frameworks or languages based on existing infrastructure or expertise within the IT department.*

Parallel Operations:

- *Concurrency: The system must support multiple users accessing and modifying data concurrently without performance degradation or data inconsistency.*

Language Requirements:

- *Multi-language Support: Considering the diverse university environment, the system may need to support multiple languages, particularly for international students.*

Communications Protocols:

- *Secure Data Transmission: Ensuring the use of secure communication protocols such as HTTPS to protect data in transit.*

Security Considerations:

- *Authentication and Authorization: Implementing robust mechanisms for user authentication and role-based access control.*
- *Data Encryption: Mandating encryption for sensitive data both at rest and in transit.*

Design Conventions or Programming Standards:

- *Code Maintainability: Adhering to programming standards and documentation practices to facilitate future maintenance by the university's IT department.*
- *UI/UX Guidelines: Following design conventions or guidelines provided by the university to ensure consistency with other campus systems.*

Other Considerations:

- *Scalability: The system must be designed to easily accommodate an increasing number of users and data volume.*
- *Backup and Recovery: Implementing procedures for data backup and recovery to prevent data loss.*

f. User Documentation

For the Final Year Project Management System (FYPMS), we plan to deliver a comprehensive suite of user documentation components to ensure users can effectively utilize the system. These documentation components are designed to cater to the diverse needs of our user base, including students, faculty members, and administrative staff. Here's an overview of the user documentation that will accompany the FYPMS:

User Manuals:

- *Comprehensive User Manual: A detailed guide covering all functionalities of the FYPMS for all user roles (students, supervisors, FYP committee members, and panel members). This manual will include step-by-step instructions for common tasks, troubleshooting tips, and FAQs.*
- *Quick Start Guides: Concise manuals focused on getting users started with the system's core functionalities. Separate guides may be provided for different user roles.*

Online Help:

- *Contextual Help: Integrated within the FYPMS, offering immediate, relevant assistance related to the current task or page. This will include tooltips, pop-up help boxes, and clickable "?" icons.*
- *FAQ Section: A dynamically updated online FAQ to address common questions and issues encountered by users.*

Tutorials:

- *Video Tutorials: Short, engaging video guides demonstrating how to perform specific tasks within the system. These will be accessible directly from within the FYPMS and possibly through a dedicated YouTube channel or the university's learning management system (LMS).*
- *Interactive Tutorials: Web-based interactive tutorials guiding users through key processes within the FYPMS, allowing them to learn by doing in a controlled, simulated environment.*

Delivery Formats and Standards:

- *PDF: User manuals and quick start guides will be available for download in PDF format, ensuring wide accessibility and compatibility across devices.*
- *HTML5 for Online Help: Ensuring compatibility with modern web browsers and responsiveness for various screen sizes, including tablets and smartphones.*
- *Video Formats: Tutorials will be delivered in widely supported video formats (e.g., MP4) to ensure accessibility across different platforms and devices.*

Standards:

- *Accessibility Standards: All documentation will adhere to web content accessibility guidelines (WCAG) to ensure it is accessible to users with disabilities.*
- *Language Standards: Documentation will be provided in English, with the potential for translation into other languages based on the university's demographic needs.*
- *Technical Documentation Standards: Adhering to recognized documentation standards (such as ISO/IEC/IEEE 26512) to ensure quality and consistency.*

g. Assumptions and Dependencies

In the development of the Final Year Project Management System (FYPMS), several assumptions have been made that could significantly influence the requirements and overall success of the project. Recognizing these assumptions is crucial for risk management and planning. Here's a detailed list:

Assumed Factors:

- *Technology Compatibility: We assume that the existing hardware and software infrastructure of the university will be compatible with FYPMS requirements. This includes servers, network capabilities, and end-user devices.*
- *User Adoption Rate: There's an assumption that students, faculty, and administrators will readily adopt the new system without significant resistance or the need for extensive training.*
- *Stability of External Systems: We assume that third-party or commercial components, such as the database management system (DBMS) and email service providers, will remain stable and supportive of the FYPMS throughout its lifecycle.*
- *Regulatory Environment: The assumption that current data protection and privacy regulations will not undergo significant changes that could impact the system's compliance requirements.*
- *Availability of Development Tools: We assume that all necessary development tools and platforms will remain available, supported, and unchanged in terms of licensing throughout the development process.*
- *Integration Ease: There is an assumption that the FYPMS will easily integrate with existing systems, such as the Academic Record System and Authentication Services, without substantial modifications to those systems.*
- *Maintenance and Support: We assume that ongoing maintenance and support will be adequately provided by the university's IT department, including necessary updates and security patches.*

Dependencies:

- *Database Management System: The project is dependent on a specific DBMS for storing and managing data efficiently. A change in the DBMS could necessitate significant modifications to the system architecture.*

- *Authentication Services: The FYPMS is designed to integrate with the university's existing authentication framework for user login and session management. Any changes to this framework could impact the system's security mechanisms.*

- *Email System: Dependence on the university's email system for sending notifications and communications. A shift in email service providers could affect the notification functionality.*

- *Reuse of Components: There may be dependencies on software components or libraries reused from other projects within the university, assuming these components are stable and will not require significant updates in the near future.*

5. External Interface Requirements

a. User Interfaces

The interface between the Final Year Project Management System (FYPMS) and its users is a critical component of the system design, emphasizing usability, accessibility, and consistency across various user roles. While detailed UI design will be documented separately in a User Interface Specification, here are the logical characteristics and standards that guide the development of the user interfaces:

User Interface Components:

- *Dashboard: Central hub for users, tailored to each role (Student, Supervisor, FYP Committee Member, Panel Member), displaying relevant notifications, tasks, and shortcuts.*
- *Project Management: Interfaces for submitting project proposals, viewing project details, and tracking progress.*
- *User Management: Interfaces for creating and managing user accounts, including setting roles and permissions.*
- *Communication Tools: Messaging and notification interfaces for in-system communication.*
- *Reporting Tools: Interfaces for generating and viewing reports on project statuses, evaluations, and grades.*
- *Evaluation Forms: Dynamic forms for panel members to evaluate projects and provide feedback.*

GUI Standards and Style Guides:

- *Adherence to the university's brand guidelines, including the use of official color schemes, logos, and fonts.*
- *A consistent layout across all screens, with navigation menus located in a fixed position (e.g., top or side of the screen) for easy access.*
- *Standard buttons and functions (e.g., "Home", "Back", "Logout", "Help") will be consistently placed across all screens.*

Screen Layout Constraints:

- *Responsive design to ensure usability across devices, including desktops, laptops, tablets, and smartphones.*
- *Critical information and functions should be immediately visible without the need for excessive scrolling or navigation.*
- *Information density must be balanced to avoid cognitive overload, with a focus on readability and clarity.*

Standard Buttons and Functions:

- *A "Help" button on every screen, providing context-sensitive assistance and access to online documentation.*
- *Standardized error message displays, offering clear, non-technical descriptions of errors along with suggestions for resolution.*

Keyboard Shortcuts:

- *Implementation of common keyboard shortcuts for navigation and frequent actions (e.g., Ctrl+S to save, Ctrl+Z to undo) to enhance usability for power users.*

Error Message Display Standards:

- *Error messages will be displayed in a consistent format across the system, using modal dialogs or dedicated message areas within the interface.*
- *Messages will be specific, actionable, and user-friendly, avoiding technical jargon where possible.*

Accessibility:

- *Compliance with Web Content Accessibility Guidelines (WCAG) to ensure the system is usable by people with a wide range of disabilities.*
- *Use of alternative text for images, proper contrast ratios, and keyboard navigable interfaces.*

Sample Screen Images:

- *While specific screen images are to be detailed in the User Interface Specification, sample screens will be provided to illustrate the application of GUI standards, layout principles, and the overall look and feel of the system.*

b. Hardware Interfaces

For the Final Year Project Management System (FYPMS), the interaction between the software product and the underlying hardware components is critical to ensuring seamless operation and accessibility across various devices and platforms. Below is an overview of the logical and physical characteristics of these interfaces:

Supported Device Types:

- *Desktops and Laptops: The system is optimized for use on Windows and macOS operating systems, supporting a wide range of browsers such as Chrome, Firefox, Safari, and Edge.*
- *Mobile Devices: The system offers responsive design for accessibility on smartphones and tablets running iOS and Android operating systems. This ensures functionality and usability across mobile web browsers.*

- *Printers: For generating hard copies of reports, evaluations, and other documents, the system supports standard network printers accessible within the university's network.*

Data and Control Interactions:

- *Input Devices: The system receives input through standard devices such as keyboards, mice, touchscreens, and possibly voice commands, facilitating interaction with the software through form submissions, navigation controls, and other interactive elements.*
- *Display Outputs: Information is presented to the users through computer monitors, laptop screens, and mobile device displays, with layouts optimized for the screen size and resolution of each device type.*
- *Printing: The software interfaces with printers for the physical output of documents, utilizing standard printing protocols supported by the operating systems.*

Communication Protocols:

- *HTTP/HTTPS: The primary protocol for web-based communication between the client devices and the server hosting the FYPMS. HTTPS ensures that data in transit is encrypted for security.*
- *WebSocket: For real-time communication features within the FYPMS, such as live notifications or chat functions, the WebSocket protocol may be employed to allow a persistent connection between the client and server.*
- *REST API: The server-side component of the FYPMS will expose RESTful APIs for data retrieval and manipulation, adhering to HTTP standards for creating, reading, updating, and deleting resources.*

Security Considerations:

- *SSL/TLS Encryption: All data transmitted between the client devices and the FYPMS server will be encrypted using SSL/TLS protocols to protect against eavesdropping and tampering.*
- *Authentication and Authorization: The system will interact with the university's authentication service to verify user identities and enforce access controls based on user roles.*

Hardware Compatibility Testing:

To ensure broad compatibility, the FYPMS will undergo rigorous testing across a range of hardware configurations, including different operating systems, processor speeds, memory capacities, and screen resolutions.

c. Software Interfaces

For the Final Year Project Management System (FYPMS), its efficacy and robustness are contingent on seamless integration with various software components. This integration is crucial for facilitating the system's functionalities, from user management to reporting and notifications. Below is a detailed description of the software interfaces:

Databases:

- *Database System: MySQL 8.0 / PostgreSQL 12*
- *Purpose: To store and manage all data related to users, projects, evaluations, and notifications.*
- *Data Sharing: User credentials, project details, evaluation scores, and notification logs are among the primary data shared with the FYPMS.*
- *Services Needed: The system requires database services for CRUD (Create, Read, Update, Delete) operations, executed through SQL queries.*

Operating Systems:

- *Supported OS: Windows 10 and higher, macOS Mojave (10.14) and higher*
- *Purpose: To ensure the FYPMS is accessible across various desktop platforms.*
- *Communications: The system will utilize standard OS networking and security protocols for data transmission and encryption.*

Tools and Libraries:

- *Front-end Framework: React.js 17.0 / Angular 11*
- *Purpose: To build a dynamic and responsive user interface for the web application.*
- *Back-end Framework: Node.js 14.0 / Django 3.1*
- *Purpose: To handle server-side logic, database interactions, and API services.*
- *Authentication Service: OAuth 2.0 with JWT for secure user authentication and authorization.*
- *Purpose: To manage user sessions and secure access to the system.*

Integrated Commercial Components:

- *Email Service: SendGrid API v3 / MailChimp API v3.0*

- *Purpose: To send automated email notifications to users regarding updates, deadlines, and feedback.*
- *Outgoing Data: Email notifications containing system-generated messages.*

Communications:

- *RESTful API: Utilized for front-end to back-end communication.*
- *Data Items: HTTP requests and responses containing JSON payloads for user data, project information, evaluations, and notifications.*
- *WebSocket Protocol: For real-time communication features within the FYPMS.*
- *Purpose: Live updates and notifications, facilitating instant communication channels between users and the system.*

Data Sharing Across Software Components:

- *Shared Data: Includes user profiles, project assignments, evaluation results, and notification preferences.*
- *Mechanism: Data sharing between the database and application layers will be managed through API calls. For real-time features, WebSockets may be used for direct data exchanges between client and server.*

Implementation Constraints:

- *Global Data Area: For multitasking and concurrent operations, the system may utilize shared memory spaces or global data areas, especially in handling user sessions and real-time data updates.*
- *API Protocols: Detailed API documentation will be provided, outlining endpoint URLs, request/response structures, and authentication methods, ensuring standardized communication across components.*

d. Communications Interfaces

The Final Year Project Management System (FYPMS) necessitates a comprehensive communication framework to support its functionalities effectively. This framework encompasses various modes of communication, including email notifications, web-based interactions, and network server communications. Below are the requirements associated with these communications functions:

Email Communications:

- *Service Providers: Integration with email service providers like SendGrid or MailChimp for sending automated emails.*

- *Purpose: To notify users about project updates, deadlines, feedback, and other relevant information.*

- *Message Formatting: Emails will adhere to HTML formatting to allow for styled text, images, and links, ensuring that notifications are both informative and engaging.*

- *Security Issues: Emails containing sensitive information will use encryption. Users will be advised not to share sensitive data via email.*

Web Browser Communications:

- *Supported Browsers: The system will support major web browsers, including Chrome, Firefox, Safari, and Edge, ensuring wide accessibility.*

- *Web Standards: Utilization of HTML5, CSS3, and JavaScript for front-end development, ensuring a responsive and dynamic user interface.*

- *Communication Protocols: HTTPS will be used for all web browser communications to encrypt data in transit, protecting against interception and unauthorized access.*

Network Server Communications:

- *Protocols: HTTP/HTTPS for standard web communications, with RESTful APIs for server-client data exchange.*

- *Data Transfer Rates: The system will be optimized for efficiency, minimizing data payload sizes for faster loading times and responsiveness.*

- *Synchronization Mechanisms: WebSockets or long-polling HTTP requests for real-time features, ensuring that user interfaces are promptly updated with the latest data.*

Electronic Forms:

- *Implementation: Forms for project registration, submissions, and evaluations will be web-based, accessible through the user interface.*

- *Data Validation: Client-side and server-side validation to ensure data integrity and prevent submission of incomplete or incorrect forms.*

Communication Standards:

- *HTTP/HTTPS: For secure web communications, ensuring data integrity and confidentiality.*

- *RESTful APIs: For structured server-client communications, facilitating clear request-response patterns for data operations.*

- *WebSocket: For real-time communications where necessary, supporting live updates without the need to refresh the web page.*

Communication Security and Encryption:

- *SSL/TLS Encryption: Mandatory for all communications to secure data in transit.*
- *Authentication and Authorization: Implementation of OAuth 2.0 for secure user authentication and authorization, with JSON Web Tokens (JWT) for maintaining user sessions.*

Additional Requirements:

- *Compatibility: Ensure communications are compatible with various network configurations, including corporate and academic networks with potential firewalls and proxy servers.*
- *Rate Limiting: Implement rate limiting on API calls and email sending to prevent abuse and ensure system stability.*
- *Backup and Recovery: Mechanisms for backing up communication logs and ensuring the ability to recover important messages in the event of system failure.*

These communication requirements are foundational to the operation of the FYPMS, ensuring that users can interact with the system efficiently, securely, and reliably

6. .System Features

Organizing the functional requirements for the Final Year Project Management System (FYPMS) by system features provides a structured overview of the major services offered by the product. This approach enables clear delineation of functionalities based on the system's components, facilitating easier understanding and implementation. Here's a breakdown structured around the key features of the FYPMS:

1. User Management:

- *Registration and Authentication: Enable users to register and authenticate using university credentials, with roles assigned based on user class (student, faculty, administrator).*
- *Profile Management: Allow users to view and edit their profiles, including contact information and preferences.*

2. Project Management:

- *Project Submission: Facilitate students and supervisors to submit project proposals, including title, description, and team members.*
- *Project Allocation: Automate the allocation of projects to students based on preferences, and distribute supervisory workload evenly among faculty.*
- *Progress Tracking: Provide tools for supervisors and students to track and report project progress through milestones and deliverables.*

3. Communication Tools:

- *In-System Messaging: Implement a messaging system for direct communication among students, faculty, and administrators within the platform.*
- *Notifications and Alerts: System to send notifications regarding project deadlines, changes, and updates through email and in-system alerts.*

4. Evaluation and Feedback:

- *Evaluation Forms: Electronic forms for panel members to evaluate projects and provide grades and feedback.*
- *Feedback Viewing: Enable students and supervisors to view feedback and evaluations submitted by panel members.*

5. Reporting:

- *Supervisor Workload Reports: Generate reports on the number of projects supervised by each faculty member to ensure equitable distribution.*
- *Evaluation Reports: Reports detailing evaluations, missing evaluations, and overall project grades, accessible by FYP committee members.*

6.Administrative Tools:

- *User Role Assignment: Allow FYP committee members to assign and modify user roles and permissions within the system.*
- *Deadline Management: Tools for setting and modifying project deadlines, visible to all relevant parties.*
- *Audit Trail and Logging: Maintain logs of system activity for security, troubleshooting, and audit purposes.*

7. Integration:

- *Academic Record System Integration: Interface with the university's academic record system for importing student information and exporting project grades.*
- *Authentication Service Integration: Integration with the university's central authentication system for secure login processes.*
- *Additional Considerations:*
- *Accessibility and Usability: Ensure the system is accessible according to WCAG guidelines and offers a user-friendly interface across devices.*
- *Security and Data Protection: Implement robust security measures to protect sensitive information, adhering to relevant data protection regulations.*

a. User Management

4.1.1 Description and Priority

This feature enables the registration, authentication, and management of user profiles within the FYPMS. It allows users to create an account, log in to the system, and update their profile information. The priority of this feature is High, as it is foundational for user access and personalized experience within the system.

- *Benefit: 9 (Critical for user access and personalization)*
- *Penalty: 9 (Lack of this feature would significantly impact the usability of the system)*
- *Cost: 5 (Resource-intensive due to security and data integrity requirements)*
- *Risk: 4 (Risks associated with data privacy and security can be mitigated with proper measures)*

4.1.2 Stimulus/Response Sequences

User Registration:

- *Stimulus: User selects the "Register" option.*
- *Response: The system presents the registration form.*
- *Stimulus: User completes the form and submits.*
- *Response: The system validates the information and creates a new user account.*

User Login:

- *Stimulus: User selects the "Login" option.*
- *Response: The system presents the login form.*
- *Stimulus: User enters credentials and submits.*
- *Response: The system validates credentials and grants access.*

Profile Update:

- *Stimulus: Logged-in user selects "Edit Profile."*
- *Response: The system displays current profile information in an editable form.*
- *Stimulus: User updates information and submits the form.*
- *Response: The system saves the updated information.*

4.1.3 Functional Requirements

REQ-1: *The system shall allow new users to register by providing necessary information, such as name, email, and password.*

REQ-2: *The system shall authenticate users based on their email and password.*

REQ-3: *The system shall offer password recovery for users who have forgotten their password.*

REQ-4: *The system shall allow users to update their profile information, including contact details and password.*

REQ-5: *The system shall provide role-based access control, ensuring users can access features and information pertinent to their role (Student, Supervisor, Committee Member).*

REQ-6: *The system shall log all user actions for audit purposes.*

REQ-7: *The system shall validate user input and provide error messages for incorrect or incomplete information during registration, login, and profile updates.*
REQ-8: *The system shall encrypt user passwords stored in the database.*
REQ-9: *In case of invalid login attempts, the system shall lock the account for a specified period after a defined number of unsuccessful attempts to prevent brute force attacks.*

b. Project Management

4.2.1 Description and Priority

The Project Management feature facilitates the submission, allocation, tracking, and evaluation of final year projects within the FYPMS. It enables students to submit project proposals, faculty to oversee project progress, and committees to allocate and evaluate projects. The priority of this feature is High due to its central role in the system's functionality.

- *Benefit: 9 (Essential for the core operation of managing projects)*
- *Penalty: 8 (Inability to manage projects effectively would render the system ineffective)*
- *Cost: 6 (Requires significant development efforts for comprehensive functionality)*
- *Risk: 3 (Well-defined requirements and processes can mitigate most risks)*

4.2.2 Stimulus/Response Sequences

Project Submission:

- *Stimulus: A student or student group submits a project proposal.*
- *Response: The system records the submission and notifies the supervisor and FYP committee.*

Project Allocation:

- *Stimulus: The FYP committee allocates projects to students and supervisors.*
- *Response: The system updates the project status and notifies relevant parties.*

Progress Tracking:

- *Stimulus: Students or supervisors update the project's progress.*
- *Response: The system logs updates and optionally notifies the other party.*

Project Evaluation:

- *Stimulus: Panel members submit evaluations for projects.*
- *Response: The system records the evaluations, calculates final grades, and notifies the students and supervisors.*

4.2.3 Functional Requirements

REQ-2-1*: The system shall allow students to submit project proposals, including project title, description, and desired supervisor.*

REQ-2-2: *The system shall enable the FYP committee to review and allocate projects to students and assign supervisors.*
REQ-2-3: *The system shall provide functionality for supervisors to monitor and update the progress of assigned projects.*
REQ-2-4: *The system shall allow panel members to evaluate completed projects using predefined criteria and submit scores.*
REQ-2-5*: The system shall automatically calculate final project grades based on panel evaluations.*
REQ-2-6: *The system shall generate and provide access to progress reports for supervisors and the FYP committee.*
REQ-2-7: *The system shall send notifications to students and faculty about important project milestones, deadlines, and evaluation outcomes.*
REQ-2-8*: In case of a project proposal submission error or missing information, the system shall provide clear error messages and guidance for correction.*
REQ-2-9: *The system shall support document uploads for project proposals, reports, and evaluations.*
REQ-2-10: *The system shall enforce deadlines for project submissions and evaluations, restricting submissions past the deadline unless an extension is granted.*

This comprehensive detailing of the Project Management feature underscores its pivotal role in the Final Year Project Management System. By systematically outlining its description, priority, expected interactions, and functional requirements, we ensure that this feature is well-understood and effectively addresses the needs of all stakeholders involved in the FYP process.

7. Other Nonfunctional Requirements

a. Performance Requirements

Performance requirements are crucial for ensuring that the Final Year Project Management System (FYPMS) meets the expectations of its users in terms of responsiveness, reliability, and efficiency. These requirements not only guide developers in making suitable design choices but also ensure that the system can handle its intended workload effectively. Below are the specified performance requirements for the FYPMS:

1. Response Time:

- *Web Interface Responsiveness: The system should respond to user actions within 2 seconds under normal conditions and no more than 5 seconds under peak load conditions, to ensure a smooth and responsive user experience.*
- *Background Processes: Tasks that run in the background, such as report generation or batch notifications, should complete within an acceptable time frame not exceeding 10 minutes, depending on the complexity and data volume.*

2. System Availability:

- *Uptime Requirement: The FYPMS should be available 99.5% of the time, allowing for scheduled maintenance windows outside of peak usage hours. This ensures that users can access the system whenever needed, with minimal disruptions.*

3. Data Handling and Processing:

- *Database Transactions: Critical database transactions, such as project submissions or grade entries, should be processed within 3 seconds to ensure data integrity and user confidence in the system's reliability.*
- *Data Export/Import: The system should be capable of exporting or importing large datasets (e.g., user lists, project details) within a reasonable time, not exceeding 5 minutes, to facilitate administrative tasks.*

4. Concurrent Users:

- *User Load Handling: The FYPMS should support up to 500 concurrent users without significant degradation in performance, ensuring that the system can accommodate the university's needs during peak periods, such as project submission deadlines.*

5. Scalability:

- *Growth Accommodation: The system design should allow for scaling to support a 20% increase in user base annually for the next five years without requiring a complete overhaul, ensuring longevity and return on investment.*

6. Security and Data Protection:

- *Encryption Overhead: The use of encryption for data in transit and at rest should not significantly impact system performance. The system should maintain its responsiveness and efficiency even when encrypting sensitive data.*

Rationale:

The rationale behind these performance requirements is to ensure that the FYPMS provides a reliable, efficient, and user-friendly platform for managing final year projects. By setting specific targets for response times, system availability, and data handling, we aim to enhance the overall user experience and ensure that the system can handle the demands of the university environment. These requirements also help developers understand the priorities and constraints they must work within, guiding them toward making design and architecture decisions that align with the system's goals.

b. Safety Requirements

Safety and security considerations are paramount in the design and implementation of the Final Year Project Management System (FYPMS). Ensuring the safety of both the users and the data they interact with is crucial to prevent loss, damage, or harm. Below are the specified safety requirements for the FYPMS, along with the necessary safeguards:

Data Privacy and Protection:

- *Requirement: Strict adherence to data privacy laws such as the General Data Protection Regulation (GDPR) or local privacy laws applicable to the university's location.*
- *Safeguard: Implement data encryption both at rest and in transit. Use secure authentication and authorization mechanisms to protect user data.*
- *Prevention: Prevent unauthorized access to personal and sensitive information by enforcing role-based access controls.*

System Integrity and Availability:

- *Requirement: Ensure the system's availability to users, especially during critical periods such as project submission deadlines.*
- *Safeguard: Implement redundancy, failover mechanisms, and regular backups to safeguard against data loss and ensure system resilience.*
- *Prevention: Prevent system overload through efficient resource management and scalability planning.*

Compliance and Certification:

- *Requirement: The system must comply with academic integrity policies set by the university and relevant educational authorities.*
- *Safeguard: Include features for plagiarism detection and academic integrity verification where necessary.*
- *Certification: Seek certification from relevant IT and educational technology standards bodies to validate the system's adherence to best practices in security and data management.*

User Safety:

- *Requirement: Protect users from harassment or any form of cyberbullying through the system's communication channels.*
- *Safeguard: Implement moderation tools and reporting mechanisms for users to flag inappropriate behavior. Establish clear guidelines and policies for system use.*

- *Prevention: Prevent the misuse of the system by enforcing strict user conduct policies and providing training on ethical use.*

External Policies and Regulations:

- *Requirement: Adherence to university policies regarding online conduct, IT security policies, and any external regulations affecting the system's design or use.*

- *Safeguard: Regularly review and update the system to ensure compliance with new or changing policies and regulations.*

- *Prevention: Educate users on the legal and policy frameworks governing the system through in-system notifications and mandatory acknowledgment of terms of use.*

Emergency Response and Reporting:

- *Requirement: Establish protocols for responding to security breaches or data loss incidents.*

- *Safeguard: Develop an incident response plan detailing steps for containment, investigation, and recovery. Designate a response team for emergency situations.*

- *Prevention: Regular security audits and vulnerability assessments to identify and mitigate potential threats.*

By specifying these safety requirements, the FYPMS aims to protect its users and their data from potential risks, ensure compliance with applicable laws and regulations, and maintain a safe, secure, and reliable platform for managing final year projects. Developers and administrators must prioritize these safeguards and preventative measures throughout the system's lifecycle to uphold the highest safety standards.

c. Security Requirements

Security and privacy are critical components in the design, development, and deployment of the Final Year Project Management System (FYPMS). Here, we define specific requirements to ensure the system's integrity, confidentiality, and availability, alongside user privacy and data protection measures.

Security Requirements:

1. *User Authentication:*

- *Requirement: Implement strong, multi-factor authentication mechanisms for all users, ensuring secure access to the system.*
- *Details: Utilize a combination of passwords, OTPs (One Time Passwords), or university ID cards as authentication factors.*

2. *Data Encryption:*

- *Requirement: Encrypt sensitive data both at rest and in transit using industry-standard encryption protocols.*
- *Details: Utilize TLS for data in transit and AES for data at rest.*

3. *Access Control:*

- *Requirement: Implement role-based access control (RBAC) to enforce the principle of least privilege.*
- *Details: Define clear roles and permissions for students, faculty, and administrators to access only the data and functionality relevant to their role.*

4. *Audit Logging:*

- *Requirement: Maintain detailed audit logs for all user activities, system changes, and data access.*
- *Details: Logs should include timestamps, user IDs, actions taken, and the outcome of those actions.*

5. *Security Certifications:*

- *Requirement: The system must meet or exceed the standards required for relevant security certifications, such as ISO/IEC 27001 for information security management.*
- *Details: Undergo periodic audits and assessments to maintain certification status.*

Privacy Requirements:

1. *Data Privacy and Protection:*

- *Requirement: Adhere to regulations such as the General Data Protection Regulation (GDPR) or local data protection laws.*
- *Details: Implement data minimization, purpose limitation, and storage limitation principles. Provide users with access to their data and the ability to rectify or delete their information.*

2. *User Consent:*

- *Requirement: Obtain explicit consent from users for the collection, use, and sharing of their data.*
- *Details: Include clear, accessible consent forms and privacy notices detailing how user data will be used.*

3. *Anonymity in Evaluations:*

- *Requirement: Ensure the anonymity of students during project evaluations to prevent bias.*
- *Details: Utilize anonymized IDs for project submissions and evaluations.*

External Policies and Regulations:

Requirement: The FYPMS must comply with the university's IT security policies, as well as any applicable local, national, or international regulations affecting data security and privacy.
Details: This includes, but is not limited to, GDPR in Europe, FERPA in the United States for educational records, and any specific educational standards set by local educational authorities.
By establishing these security and privacy requirements, the FYPMS aims to protect against unauthorized access, ensure the confidentiality and integrity of data, and safeguard the privacy of its users. Compliance with these requirements, alongside adherence to external policies and the attainment of security certifications, will form the backbone of the system's trustworthiness and reliability.

d. Software Quality Attributes

For the Final Year Project Management System (FYPMS), ensuring high-quality characteristics is essential to meet the expectations of both users and developers. Below are specific quality characteristics that have been identified as crucial for the FYPMS:

1. *Usability:*

    - *Requirement: The system should feature an intuitive UI/UX design to ensure ease of use. At least 90% of test users should be able to complete common tasks without assistance on their first attempt.*

    - *Preference: Prioritize ease of use over ease of learning, as the system's primary users will be frequent users (students, faculty, administrators) who will quickly become familiar with its operations.*

2. *Reliability:*

    - *Requirement: The system should achieve 99.5% uptime, excluding scheduled maintenance. The error rate should not exceed 0.1% of all transactions.*

    - *Details: Implement redundancy and effective error handling to minimize downtime and data inaccuracies.*

3. *Maintainability:*

    - *Requirement: The codebase should adhere to industry-standard coding practices to ensure that at least 75% of maintenance tasks can be completed within one working day.*

    - *Details: Use clear documentation and modular design to facilitate easy updates, bug fixes, and feature additions.*

4. *Portability:*

    - *Requirement: The FYPMS should be operable across different operating systems (Windows, macOS) and devices (desktops, tablets, smartphones) without requiring more than minimal adjustments.*

    - *Details: Utilize responsive web design and cross-platform compatible technologies.*

5. *Scalability:*

    - *Requirement: The system should be designed to handle a 20% increase in user load annually for the next five years without significant degradation in performance.*

    - *Details: Employ scalable architecture and technologies that support load balancing and resource allocation.*

6. *Security:*

    - *Requirement: Implement security measures to ensure that data breaches do not occur more than 0.01% of the time.*

    - *Details: Utilize encryption, secure coding practices, and regular security audits to protect against threats.*

7. *Testability:*

    - *Requirement: 95% of the code should be covered by automated tests, including unit, integration, and system tests.*

    - *Details: Develop the system with testability in mind, allowing for easy creation and execution of tests to verify functionalities.*

8. *Interoperability:*

    - *Requirement: The system must be able to exchange data with at least 3 existing university systems (e.g., Academic Record System, Authentication Service, Email System) with a success rate of 99%.*

    - *Details: Use standard data formats and protocols to ensure seamless integration with other systems.*

9. *Adaptability:*

    - *Requirement: The system should support the addition of new functionalities or modules with a turnaround time of no more than three months for major features.*

    - *Details: Design the system with a modular architecture to allow for easy updates and expansions.*

10. *Robustness:*

    - *Requirement: The system should handle erroneous inputs or unexpected user actions gracefully, without crashing, in 99% of cases.*

    - *Details: Implement comprehensive error handling and validation mechanisms.*

By specifying these quality characteristics for the FYPMS, we aim to create a system that not only meets the functional requirements but also delivers a high-quality, reliable, and user-friendly experience for all stakeholders involved. These characteristics will guide the development process, ensuring that the final product aligns with the needs and expectations of its users.

e. Business Rules

The operating principles of the Final Year Project Management System (FYPMS) define the foundational rules and guidelines regarding how the system is used and by whom. These principles, while not functional requirements per se, do influence the design and functionality of the system to ensure that these rules are upheld. Below are key operating principles for the FYPMS:

1. *Role-Based Access Control (RBAC):*

   - *Only authenticated users can access the FYPMS. User access to specific functions is governed by their role (Student, Supervisor, FYP Committee Member, Panel Member, Administrator).*

   - *Implication: The system must implement an RBAC mechanism to manage and enforce access permissions based on user roles.*

2. *Project Submission and Allocation:*

   - *Students can submit project proposals but cannot allocate projects to themselves or others.*

   - *The FYP Committee is responsible for reviewing, approving, and allocating projects to students, as well as assigning supervisors to projects.*

   - *Implication: Functional requirements to allow project submission by students and project allocation controls for the FYP Committee.*

3. *Supervisor Interaction:*

   - *Supervisors can view and manage only those projects and students assigned to them. They can provide feedback, track progress, and submit evaluations for their projects.*

   - *Implication: The system needs features for supervisors to interact with assigned projects and students within the constraints of their roles.*

4. *Evaluation Confidentiality:*

   - *Panel Members can access projects assigned for evaluation. Evaluations submitted by Panel Members are confidential and can only be viewed by the FYP Committee until final grades are released.*

   - *Implication: Functional requirements to ensure the confidentiality of evaluations and controlled access to them.*

5. *Communication and Notifications:*

   - *All users can send and receive messages within the system according to their role-based permissions. The system should also automatically notify users of relevant updates, deadlines, and feedback.*

- *Implication: The system requires an in-built messaging system and automated notifications mechanism, respecting role-based permissions.*

6. *Data Privacy and Security:*

- *Personal and project-related data must be securely stored and only accessible to authorized users. Users have the right to access their data and request corrections.*

- *Implication: The system must incorporate data protection features, including secure data storage, encryption, and user data management capabilities.*

7. *Audit Trails and Accountability:*

- *All actions performed within the FYPMS, such as submissions, updates, and evaluations, are logged to ensure accountability and facilitate audits.*

- *Implication: The system needs to maintain detailed logs of user actions and changes within the system.*

8. *System Administration:*

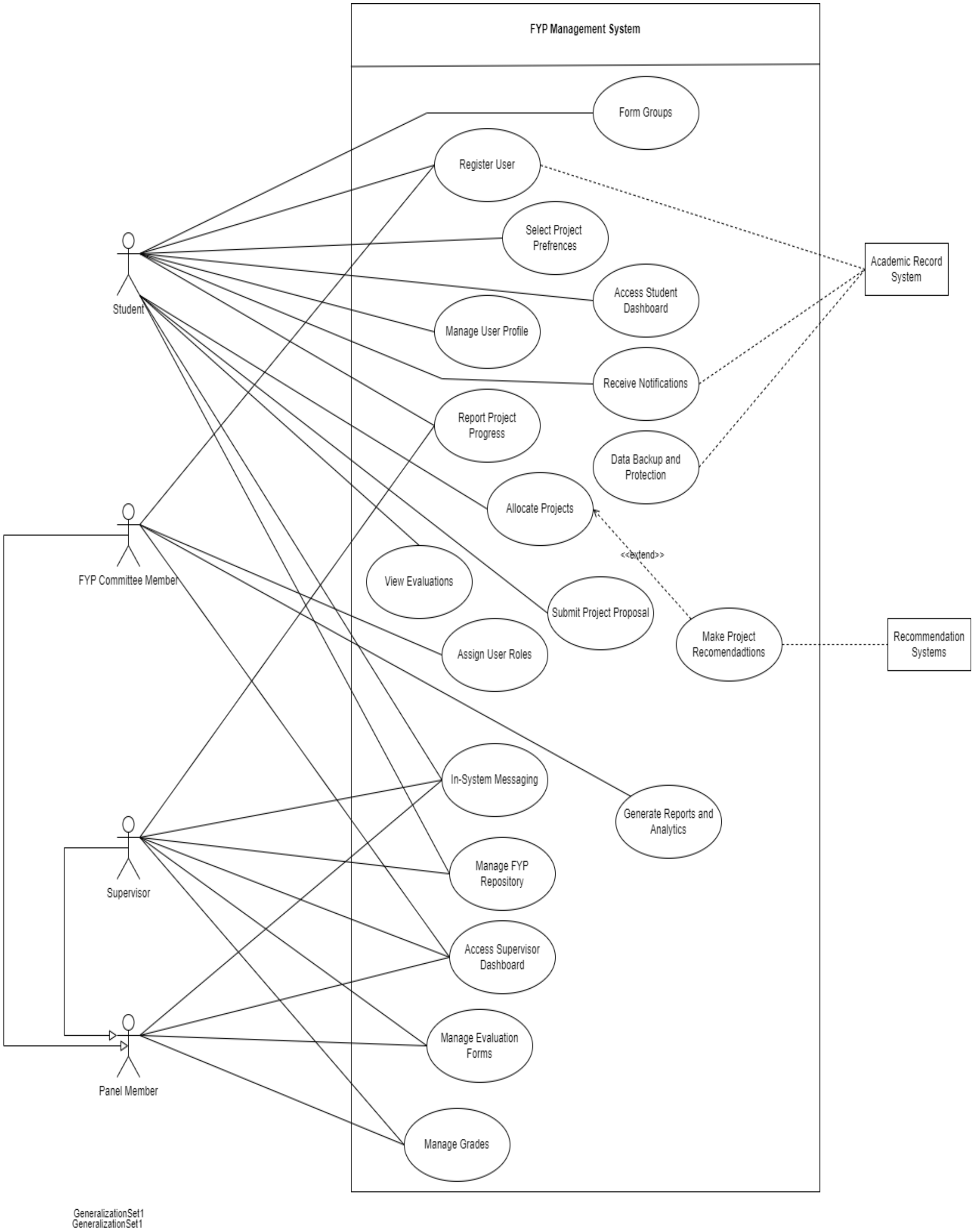
- *Administrators have overarching access to the system for maintenance, user support, and role assignments but do not partake in the academic processes of project allocation or evaluation.*

- *Implication: Administrative functionalities for system oversight, user management, and maintenance tasks must be included.*

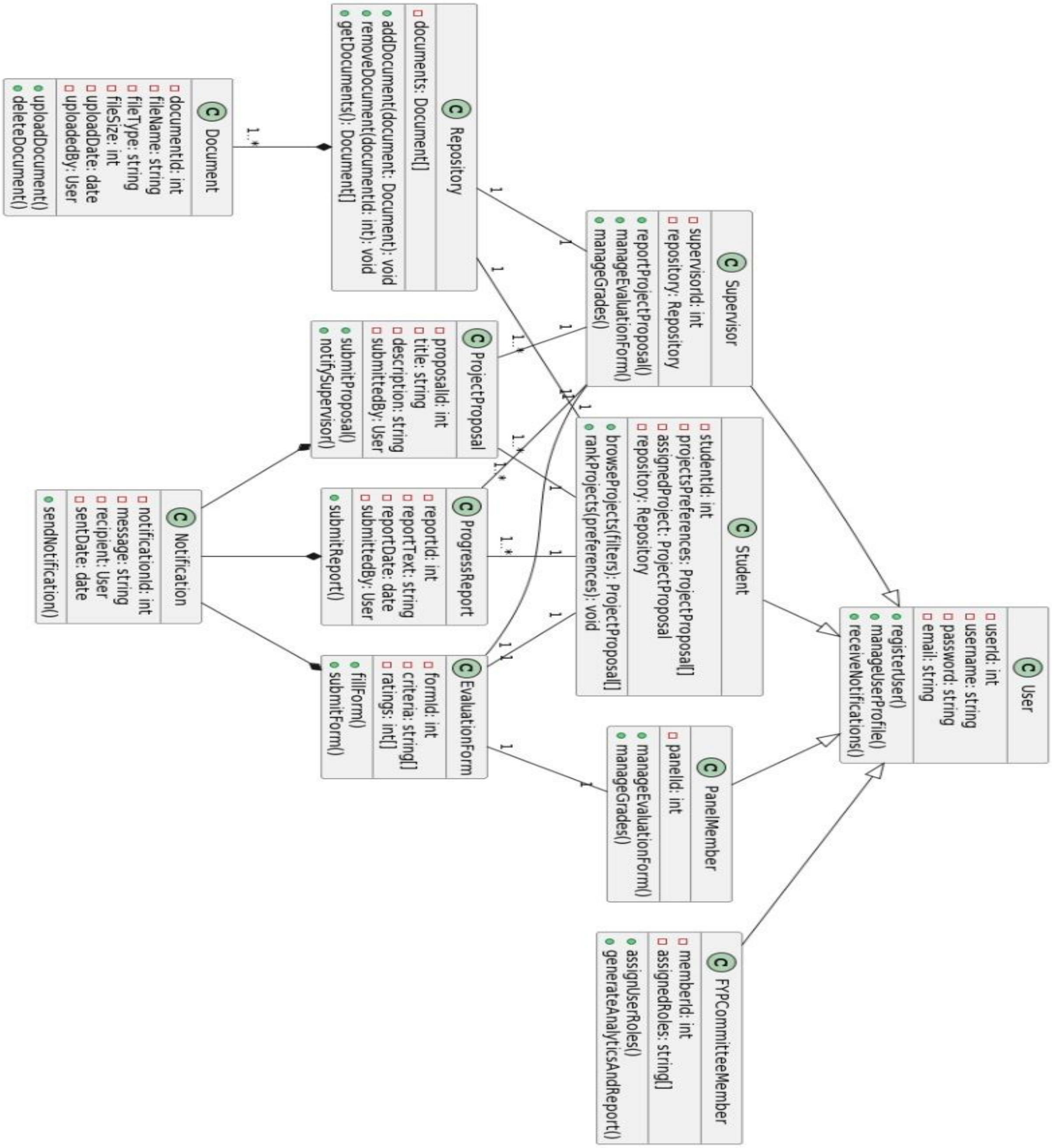
By establishing these operating principles, we lay a foundation for the functional design and development of the FYPMS, ensuring that the system supports the academic and administrative processes involved in managing final year projects while adhering to governance, privacy, and security standards.

8. Diagrams

a. Use Case Diagram

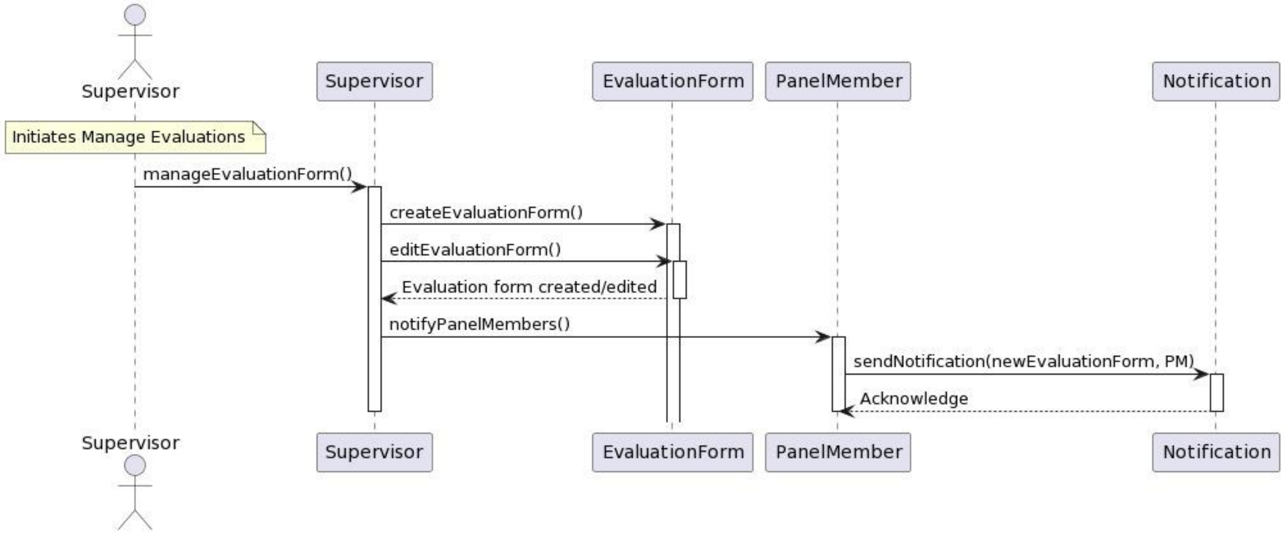


b. Class Diagram

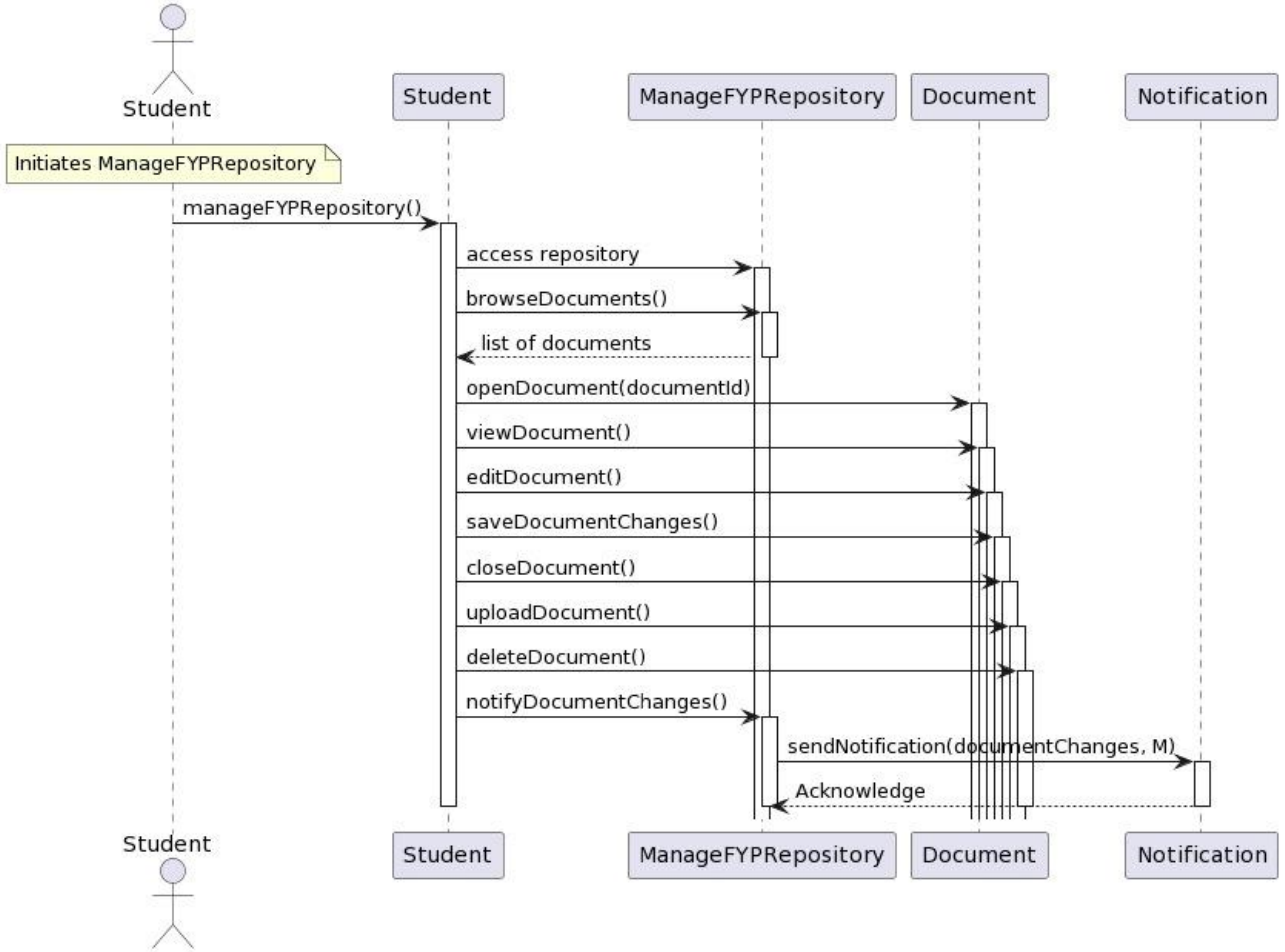


c. Sequence Diagram

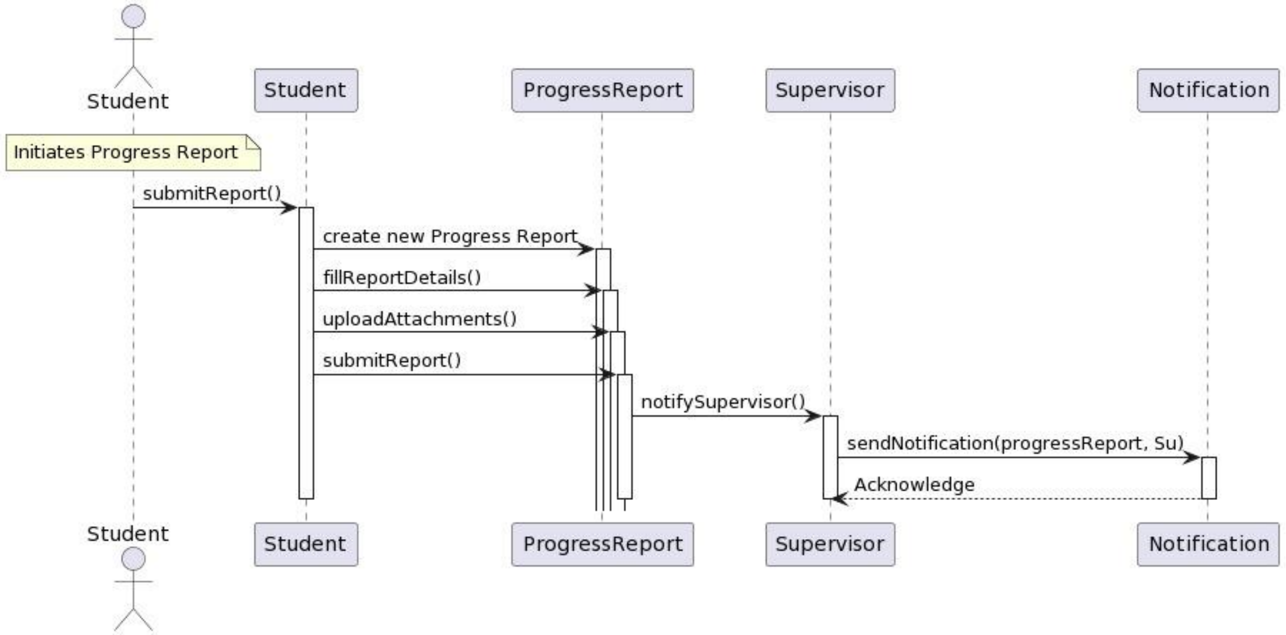
Evaluation Forms:



Repository:

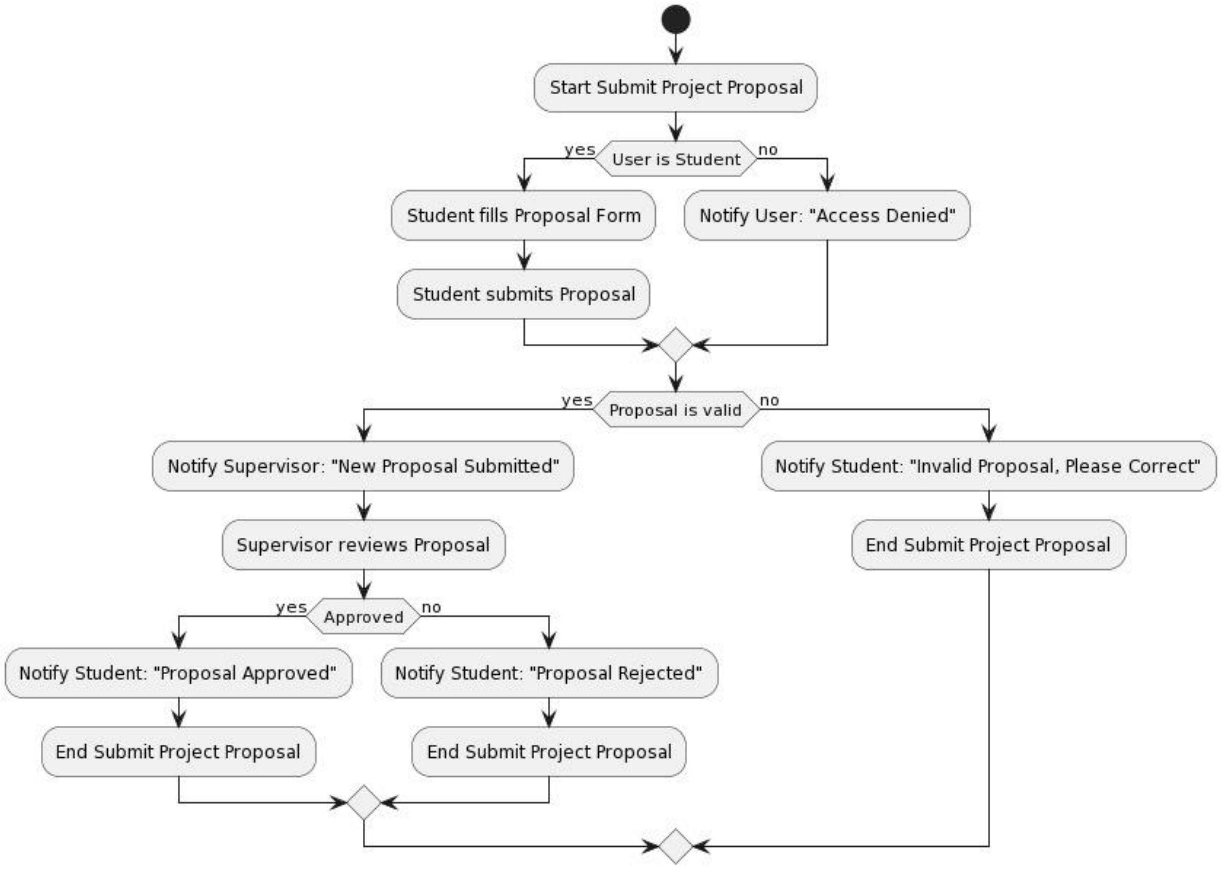


Progress Report:

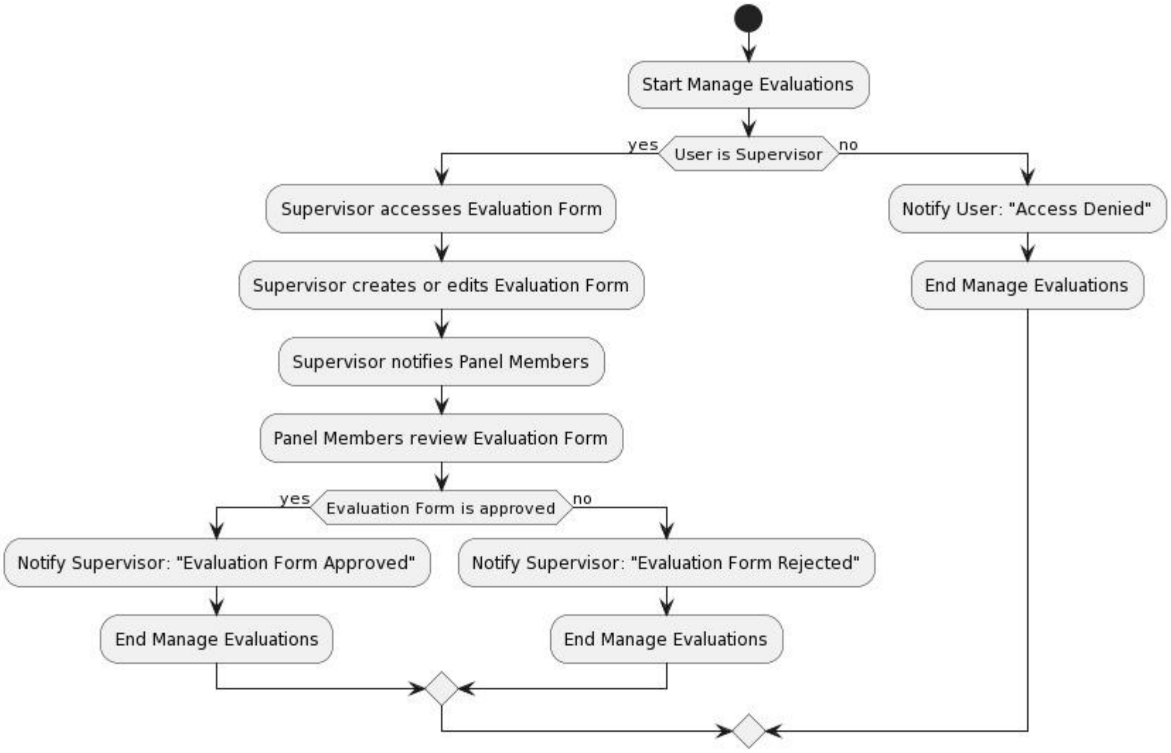


d. Activity Diagram

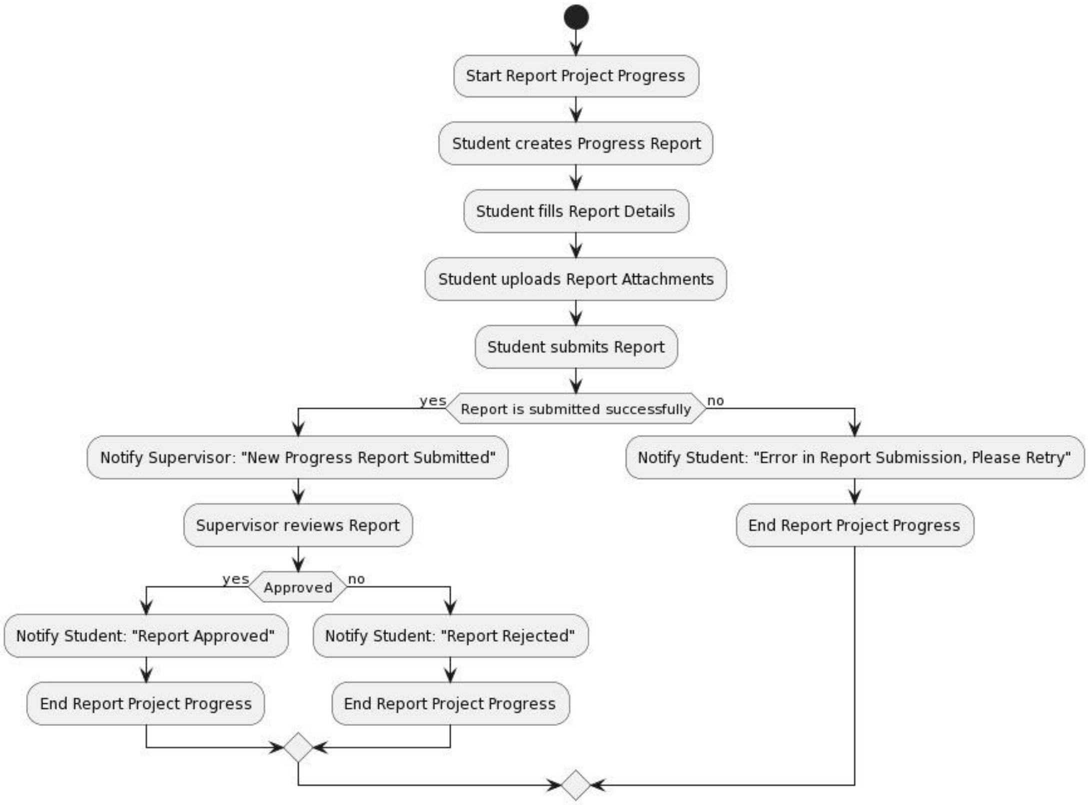
Submit Proposal Activity Diagram:


Start Submit Project Proposal
yes
User is Student
no
Student fills Proposal Form
Notify User: "Access Denied"
Student submits Proposal
yes
Proposal is valid
no
Notify Supervisor: "New Proposal Submitted"
Notify Student: "Invalid Proposal, Please Correct"
Supervisor reviews Proposal
End Submit Project Proposal
yes
Approved
no
Notify Student: "Proposal Approved"
Notify Student: "Proposal Rejected"
End Submit Project Proposal
End Submit Project Proposal

Start Manage Evaluations:


Start Manage Evaluations
User is Supervisor
yes
no
Supervisor accesses Evaluation Form
Supervisor creates or edits Evaluation Form
Supervisor notifies Panel Members
Panel Members review Evaluation Form
Evaluation Form is approved
yes
no
Notify Supervisor: "Evaluation Form Approved"
End Manage Evaluations
Notify Supervisor: "Evaluation Form Rejected"
End Manage Evaluations
Notify User: "Access Denied"
End Manage Evaluations

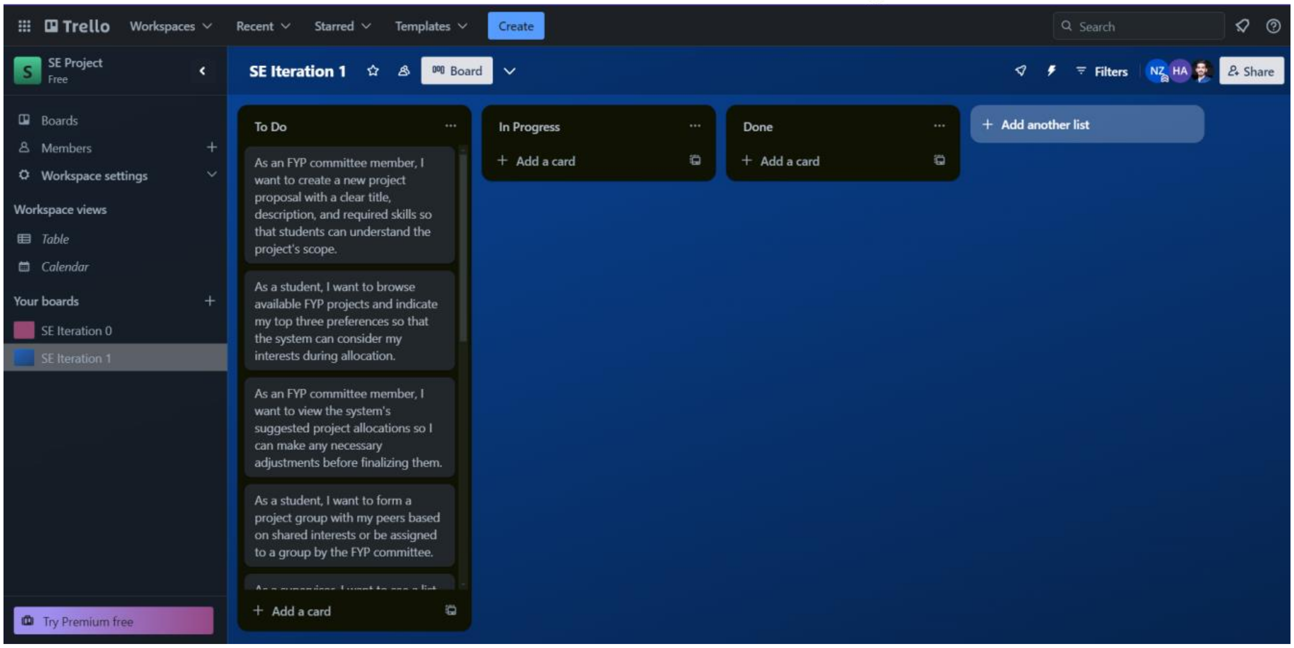
Start Report Project Progress:


Start Report Project Progress
Student creates Progress Report
Student fills Report Details
Student uploads Report Attachments
Student submits Report
Report is submitted successfully
yes
no
Notify Supervisor: "New Progress Report Submitted"
Supervisor reviews Report
Approved
yes
no
Notify Student: "Report Approved"
End Report Project Progress
Notify Student: "Report Rejected"
End Report Project Progress
Notify Student: "Error in Report Submission, Please Retry"
End Report Project Progress

Appendix: (To be determined)

1. *TBD -* ***Specific Database Technology****: Final decision on whether to use MySQL 8.0 or PostgreSQL 12 for the database management system, as referenced in the Software Interfaces section.*
2. *TBD -* ***Authentication Protocols****: Determine the specific protocols for OAuth 2.0 with JWT implementation, ensuring compatibility with the university's existing authentication systems.*
3. *TBD -* ***Detailed Hardware Specifications****: Establish detailed hardware requirements for server hosting the FYPMS, ensuring adequate performance under peak load, as mentioned in the Operating Environment section.*
4. *TBD -* ***Email Service Provider****: Decide between SendGrid API v3 and MailChimp API v3.0 for automated email notifications.*
5. *TBD -* ***User Interface Design Standards****: Finalize the UI/UX design guidelines and standards that the FYPMS will adhere to, ensuring consistency with the university's brand guidelines.*
6. *TBD* ***- Integration with Academic Record Systems****: Detailed plan for integrating with specific academic record systems for importing student data and exporting grades.*
7. *TBD -* ***Data Encryption Standards****: Specify the encryption standards for data at rest and in transit, aligning with security and privacy requirements.*
8. *TBD -* ***Third-party Libraries and Dependencies****: List of all third-party libraries and software dependencies, including versions and licenses.*
9. *TBD -* ***Compliance with GDPR and Other Regulations****: Detailed compliance plan for GDPR and any other applicable data protection and privacy regulations.*
10. *TBD -* ***Backup and Recovery Procedures****: Establish comprehensive backup and recovery procedures for the FYPMS data.*

Trello Work:

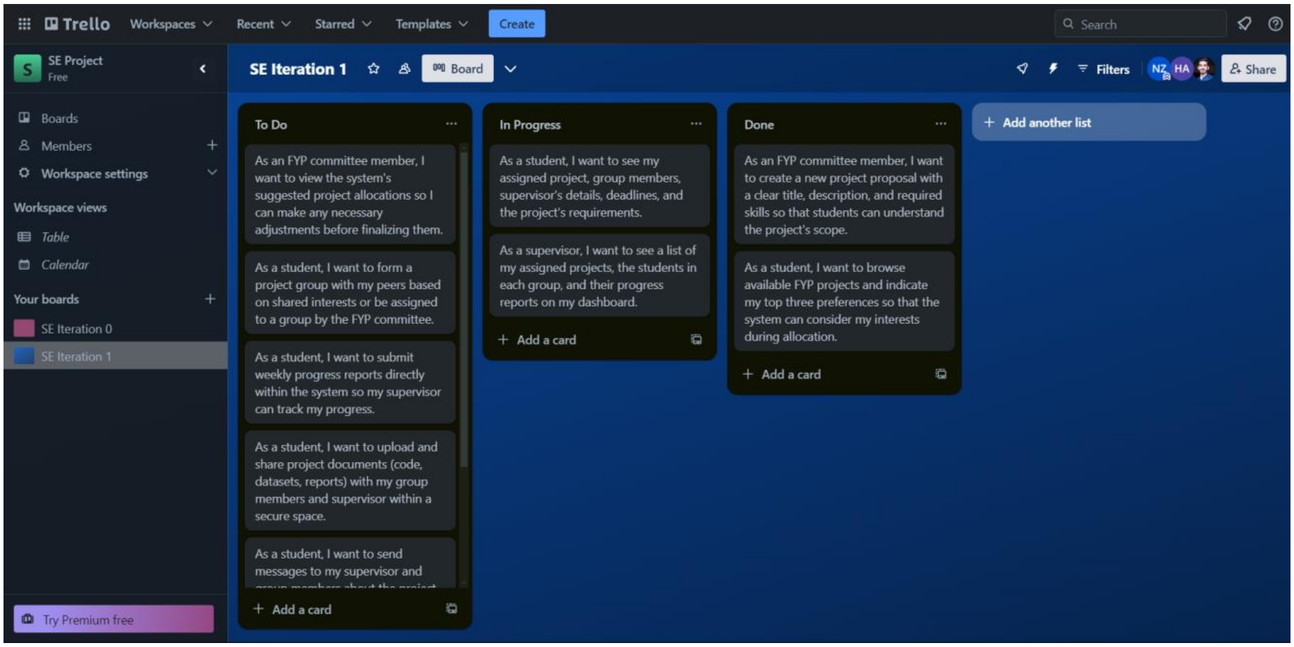


As an FYP committee member, I want to create a new project proposal with a clear title, description, and required skills so that students can understand the project's scope.

As a student, I want to browse available FYP projects and indicate my top three preferences so that the system can consider my interests during allocation.

As an FYP committee member, I want to view the system's suggested project allocations so I can make any necessary adjustments before finalizing them.

As a student, I want to form a project group with my peers based on shared interests or be assigned to a group by the FYP committee.



To Do

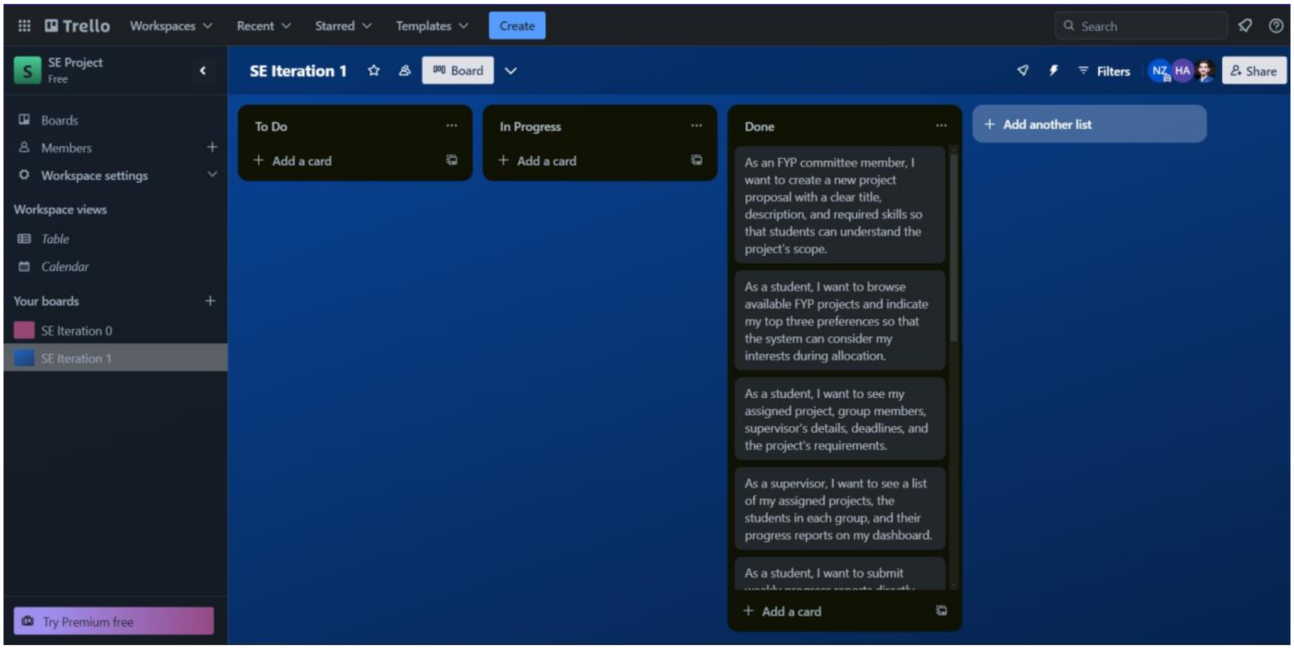
- As an FYP committee member, I want to view the system's suggested project allocations so I can make any necessary adjustments before finalizing them.
- As a student, I want to form a project group with my peers based on shared interests or be assigned to a group by the FYP committee.
- As a student, I want to submit weekly progress reports directly within the system so my supervisor can track my progress.
- As a student, I want to upload and share project documents (code, datasets, reports) with my group members and supervisor within a secure space.
- As a student, I want to send messages to my supervisor and

In Progress

- As a student, I want to see my assigned project, group members, supervisor's details, deadlines, and the project's requirements.
- As a supervisor, I want to see a list of my assigned projects, the students in each group, and their progress reports on my dashboard.

Done

- As an FYP committee member, I want to create a new project proposal with a clear title, description, and required skills so that students can understand the project's scope.
- As a student, I want to browse available FYP projects and indicate my top three preferences so that the system can consider my interests during allocation.

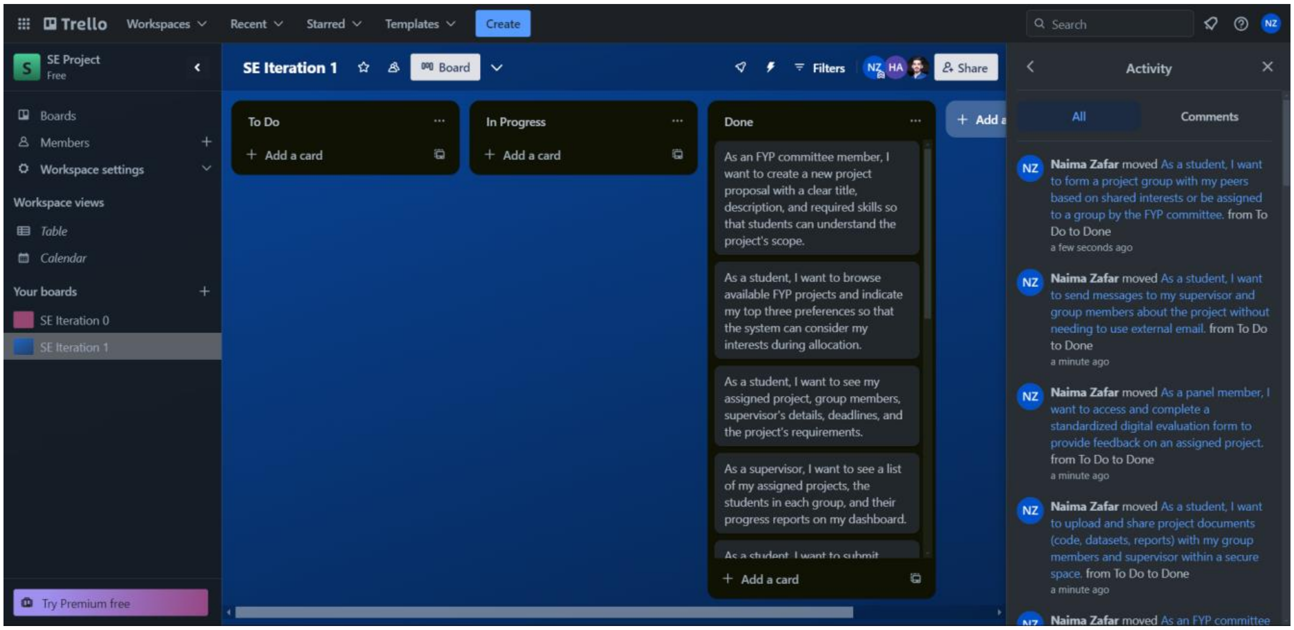


To Do

In Progress

Done

- As an FYP committee member, I want to create a new project proposal with a clear title, description, and required skills so that students can understand the project's scope.
- As a student, I want to browse available FYP projects and indicate my top three preferences so that the system can consider my interests during allocation.
- As a student, I want to see my assigned project, group members, supervisor's details, deadlines, and the project's requirements.
- As a supervisor, I want to see a list of my assigned projects, the students in each group, and their progress reports on my dashboard.
- As a student, I want to submit



As an FYP committee member, I want to create a new project proposal with a clear title, description, and required skills so that students can understand the project's scope.

As a student, I want to browse available FYP projects and indicate my top three preferences so that the system can consider my interests during allocation.

As a student, I want to see my assigned project, group members, supervisor's details, deadlines, and the project's requirements.

As a supervisor, I want to see a list of my assigned projects, the students in each group, and their progress reports on my dashboard.

As a student, I want to submit

NZ **Naima Zafar** moved As a student, I want to form a project group with my peers based on shared interests or be assigned to a group by the FYP committee. from To Do to Done
a few seconds ago

NZ **Naima Zafar** moved As a student, I want to send messages to my supervisor and group members about the project without needing to use external email. from To Do to Done
a minute ago

NZ **Naima Zafar** moved As a panel member, I want to access and complete a standardized digital evaluation form to provide feedback on an assigned project. from To Do to Done
a minute ago

NZ **Naima Zafar** moved As a student, I want to upload and share project documents (code, datasets, reports) with my group members and supervisor within a secure space. from To Do to Done
a minute ago

NZ **Naima Zafar** moved As an FYP committee

GitHub: