

4.3 System Analysis

System design describes the overall structure or flow of the system, including its function. Indirectly, it will reduce the gap between the needs and the proposed system. It also transfers the proposed system functionality into the graphical diagram according to specific requirements. In this section, the proposed system design is described. Object-oriented approach is used to generate the UML diagrams, which are Use Case Diagram, Activity Diagram, Sequence Diagram and Class Diagram.

4.3.1 Use Case Diagram

Figure 4.3 shows the use case diagram that represents the overall activity using the student talent profiling app, where the interaction actor and the system functionalities are depicted. The main actor includes students, lecturers, and administrators. This diagram represents the main tasks of each actor can perform based on module listed.

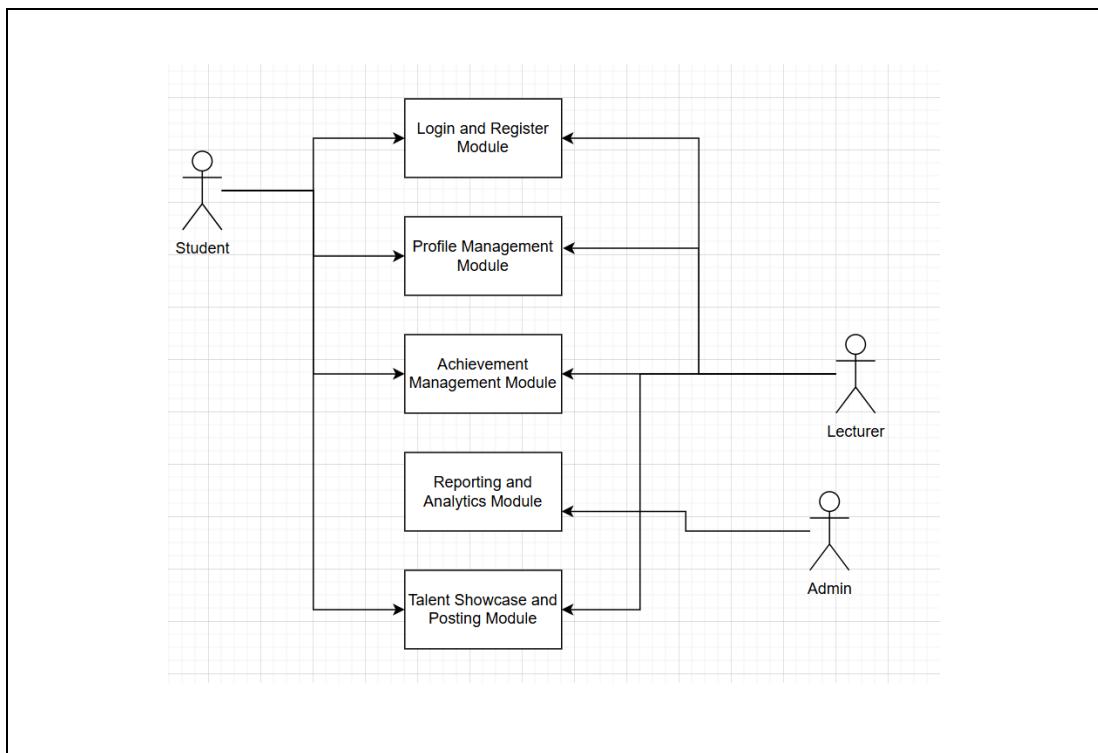


Figure 4.3: Use Case Diagram of Proposed System

4.3.2 Use Case Specification

Each use case based on each module listed, there are five modules to be specified represent action perform from actor.

(i) Use Case 1: Login Module and Register

The system is designed for user to login and register in the app. For student, it designed to help them register and login in the app after creating their profile, while for lecturer and administrator they need to login with their credential login account provided. The specification of the User Login use case is shown in Table 4.3.2.1

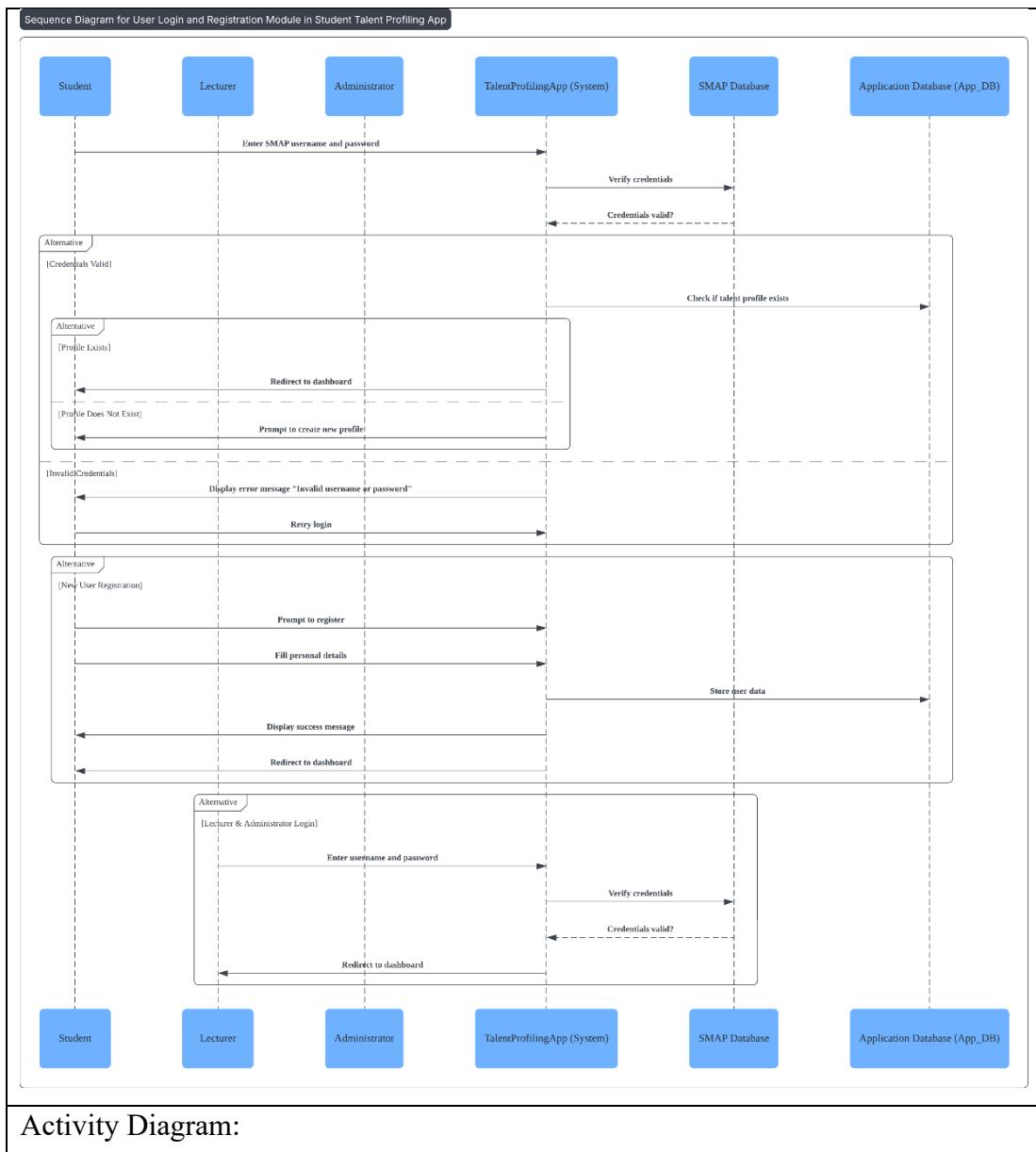
Table 4.3.2.1: Login Module and Register Use Case Specification

History Log	1.0.0	1. Create initial use case	
	1.0.1	1. Fixed alternative flow in normal flow. 2. Changed ID for alternative flow and exceptions.	
	2.0.0	1. Added history log. 2. Functional requirements are added.	
Version	2.0.0		
Use Case ID	UC-1		
Use Case Name	Login Module and Register		
Created By	Muhammad Noor Azami	Updated By	Muhammad Noor Azami
Date Created	05/06/2025	Last Revision Date	
Actors	Student, Lecturer, Administrator		
Description	Users login into the Student Talent Profiling App using valid credentials (username and password). All the details can be obtained through SMAP account.		

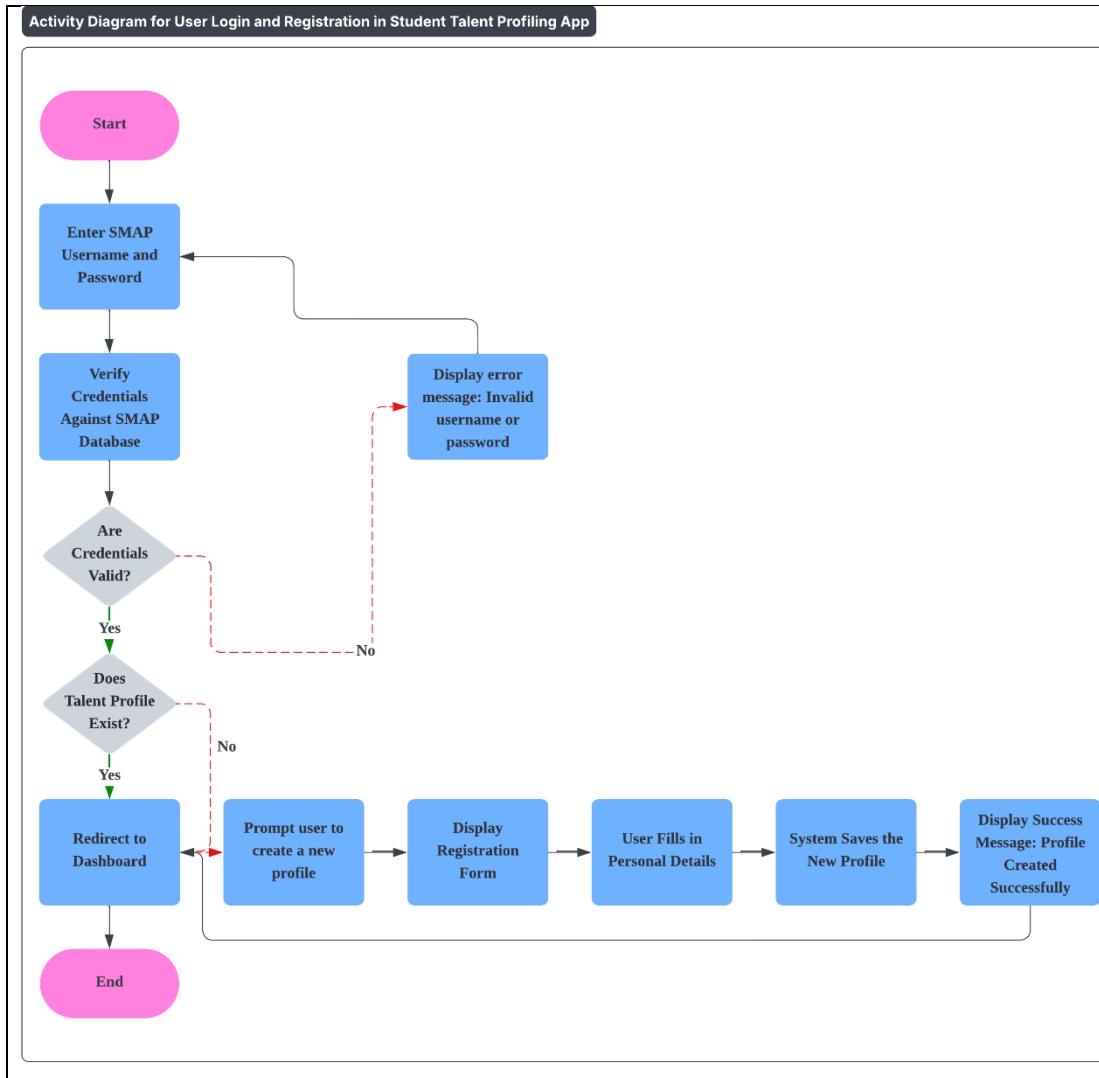
Preconditions	Users must have a valid account in the system based on SMAP account.			
Post conditions	After successful login, the user is redirected to the main dashboard of the system.			
Normal Flow	<ol style="list-style-type: none"> 1. The user enters their SMAP username and password. 2. The system verifies the credentials against the SMAP database. 3. If the credentials are valid: <ul style="list-style-type: none"> • The system checks if a talent profile exists in the app' database. • If user have talent profile, the user is redirected to their dashboard. • If no profile exists, the user is prompted to create new profile. 4. If credentials are invalid, the system displays an error message indicating invalid username or password. 			
Alternative Flow	<p>A1. Register</p> <ol style="list-style-type: none"> 1. If the user is new to the app, they are asked to register and create new profile talents. 2. The user will fill requirement of personal details. 3. The system displays pop up successful registration message and redirect user to the dashboard. 			
Exceptions	<p>E1. Invalid login</p> <ol style="list-style-type: none"> 1. If the SMAP credentials are invalid, the system displays an message error “Invalid username or password”. <p>E2. No Talent Profile</p> <ol style="list-style-type: none"> 1. If the user logs in successful but has no profile in the system, then message prompt up with “No profile found, please create a new one”. The user is then redirected to profile creation page. 			
	<th>ID</th> <th>Requirement</th> <th>Priority</th>	ID	Requirement	Priority

Related requirement	FR01-01	The system must verify the SMAP credentials during login.	Basic
	FR02-01	If the user does not have profile, the system prompts message to create new one.	High
	FR03-01	The system should display appropriate error messages for invalid login attempt or missing profiles.	High

Sequence Diagram:



Activity Diagram:



(ii) User Case 2: Profile Management

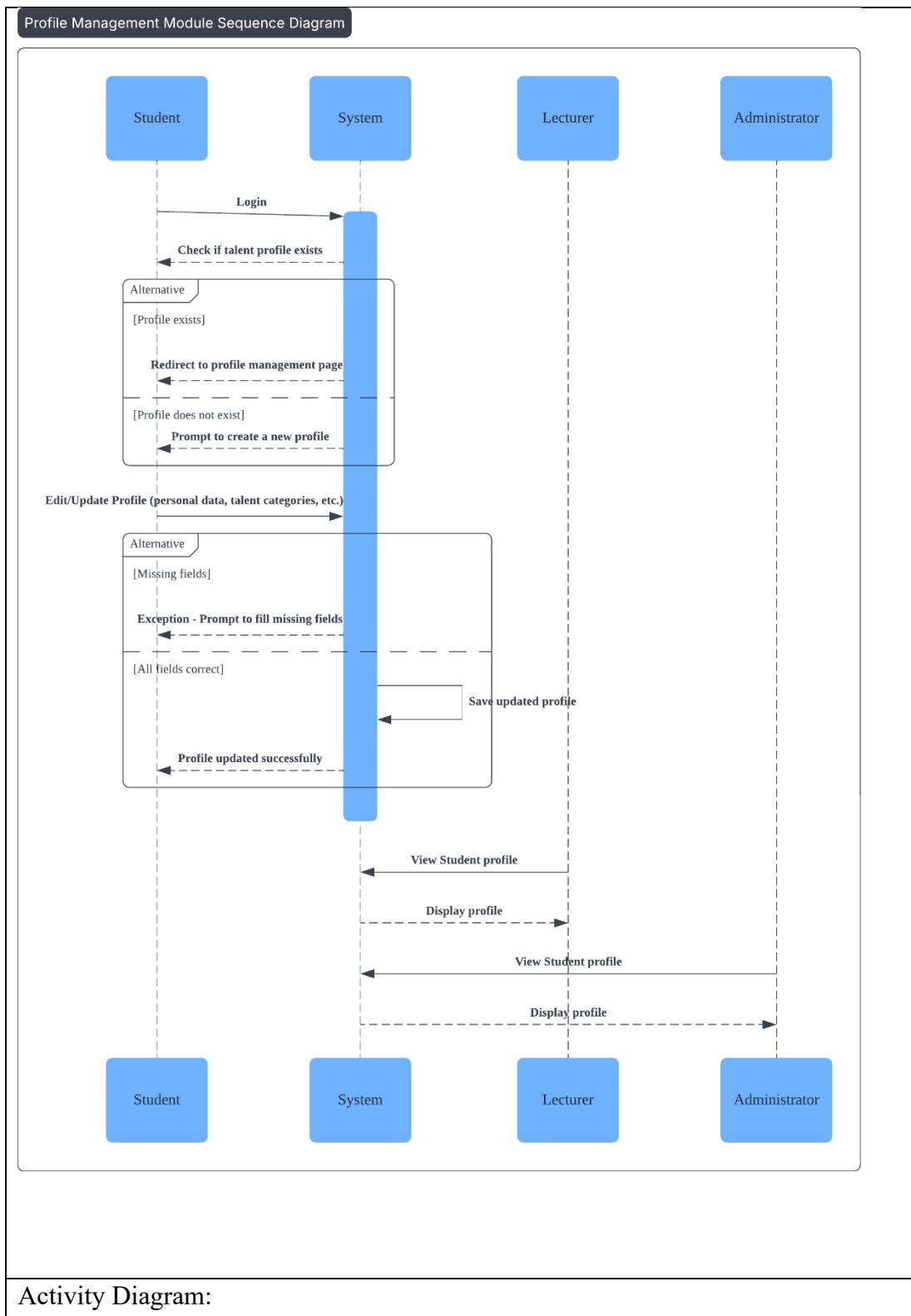
Table 4.3.2.2 shows the use case specification of profile management, this show how process of student profile is handled in the system.

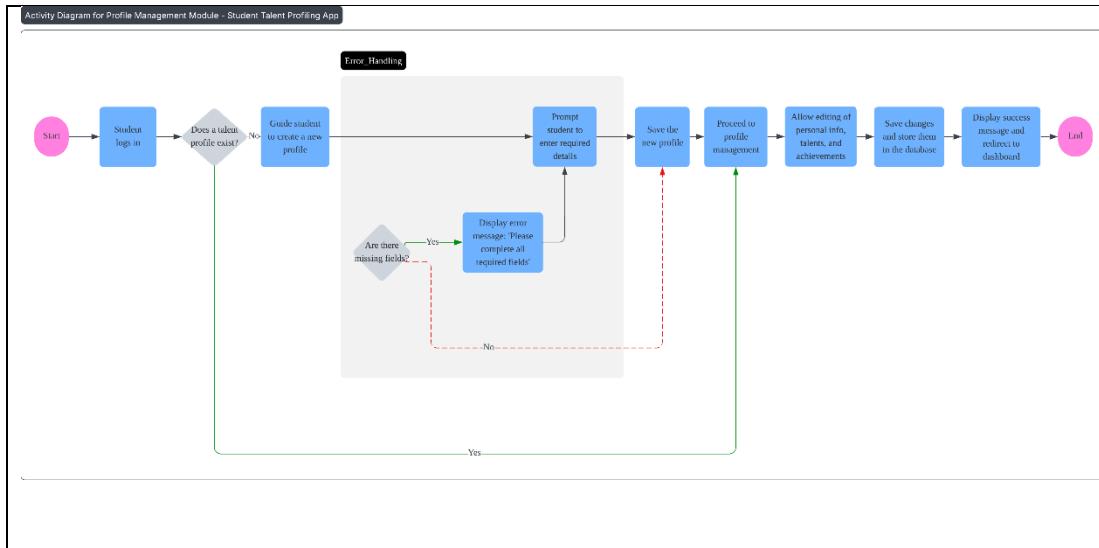
Table 4.3.2.2: Profile Management Use Case Specification

History Log	1.0.0	Created initial use case
	1.0.1	Updated normal flow and alternatives flow
	2.0.0	Finalized use case and related requirements
Version	2.0.0	
Use Case ID	UC-2	
Use Case Name	Profile Management	

Created By	Muhammad Noor Azami	Updated By	Muhammad Noor Azami
Date Created	05/06/2025	Last Revision Date	05/06/2025
Actors	Students, Lecturers, Administrator		
Description	The profile management module allows students to create, view, and update their talent profiles. Lecturers and administrators can view these profiles.		
Preconditions	The user must be logged in to access and manage their profile.		
Post conditions	The student's talent profile is updated or created, and it is saved in the system's database.		
Normal Flow	<ol style="list-style-type: none"> 1. Student logs in to the system. 2. The system checks if the student has a talent profile. If no profile exists, the system prompts the student to create a profile. If a profile exists, the student is directed to the profile management page. 3. The student can update their profile, including adding or editing information such as personal data, talent categories, achievements and qualifications. 4. After updates, the student saves the profile, and the system stores the changes. 		
Alternative Flow	<p>A1. Profile Creation</p> <ol style="list-style-type: none"> 1. If the student doesn't have a profile, they must enter following data to create one: <ul style="list-style-type: none"> Personal details Talent Categories Achievements 2. Once the student fills in the required details, the system saves the profile and redirects the student to the profile management dashboard. 		
Exceptions	<p>E1. Missing Data</p> <ol style="list-style-type: none"> 1. If the student misses any required fields, the system displays an error message such as 		

	“Please complete all required fields before saving your profile.”.		
Related requirement	ID	Requirement	Priority
	FR04-01	The system must allow students to create and update their profiles.	Basic
	FR04-02	The system should allow lecturers and administrators to view profiles.	High
	FR04-03	The system must ensure all profiles are stored securely and can be retrieved when needed.	High
Sequence Diagram:			





(iii) Use Case 3: Achievement Management

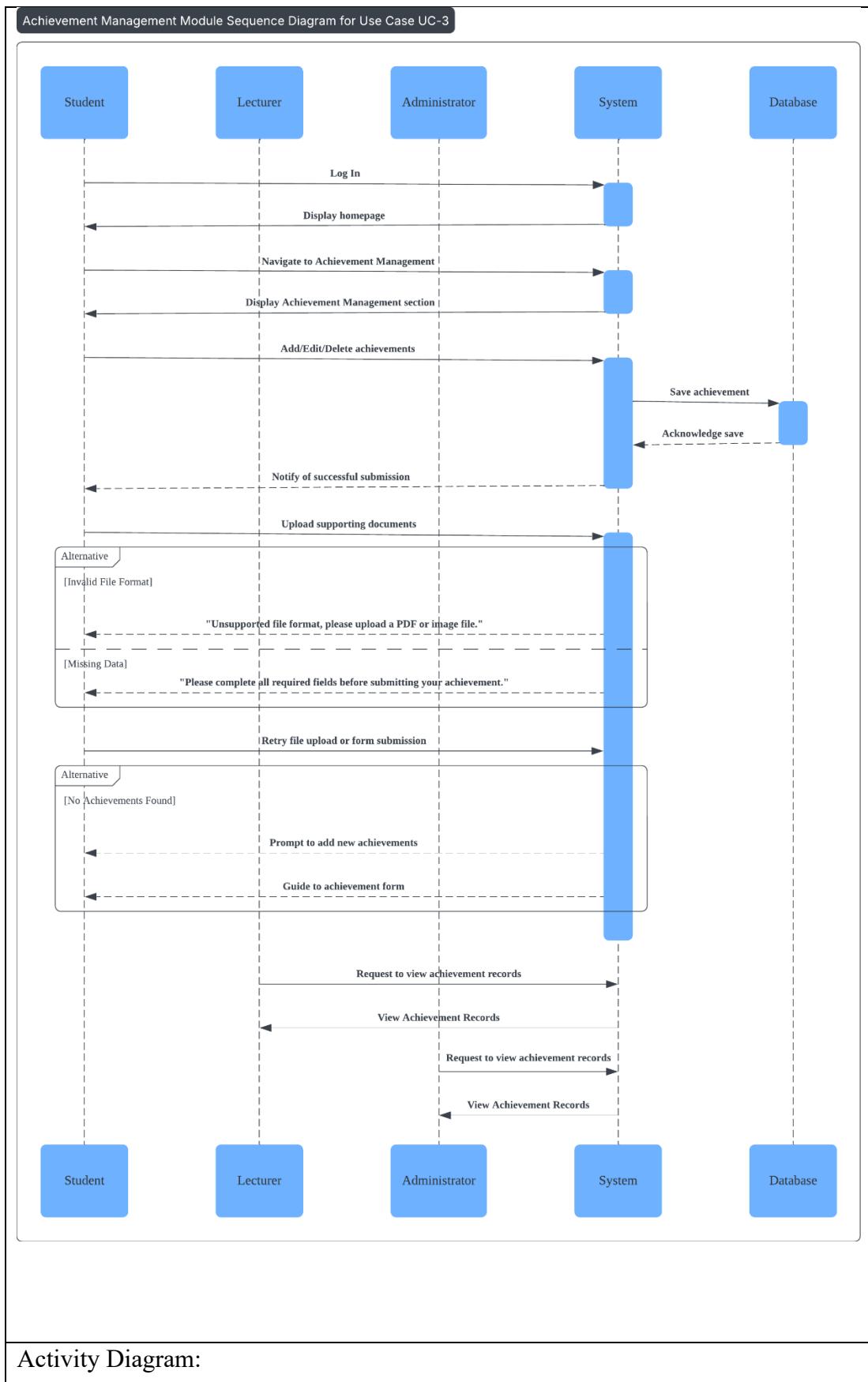
The table 4.3.2.3 shows the module for achievement management where how flow of process achievement is managed from student and lecturer perspective to view the list while the admin can access it to added it as report insight.

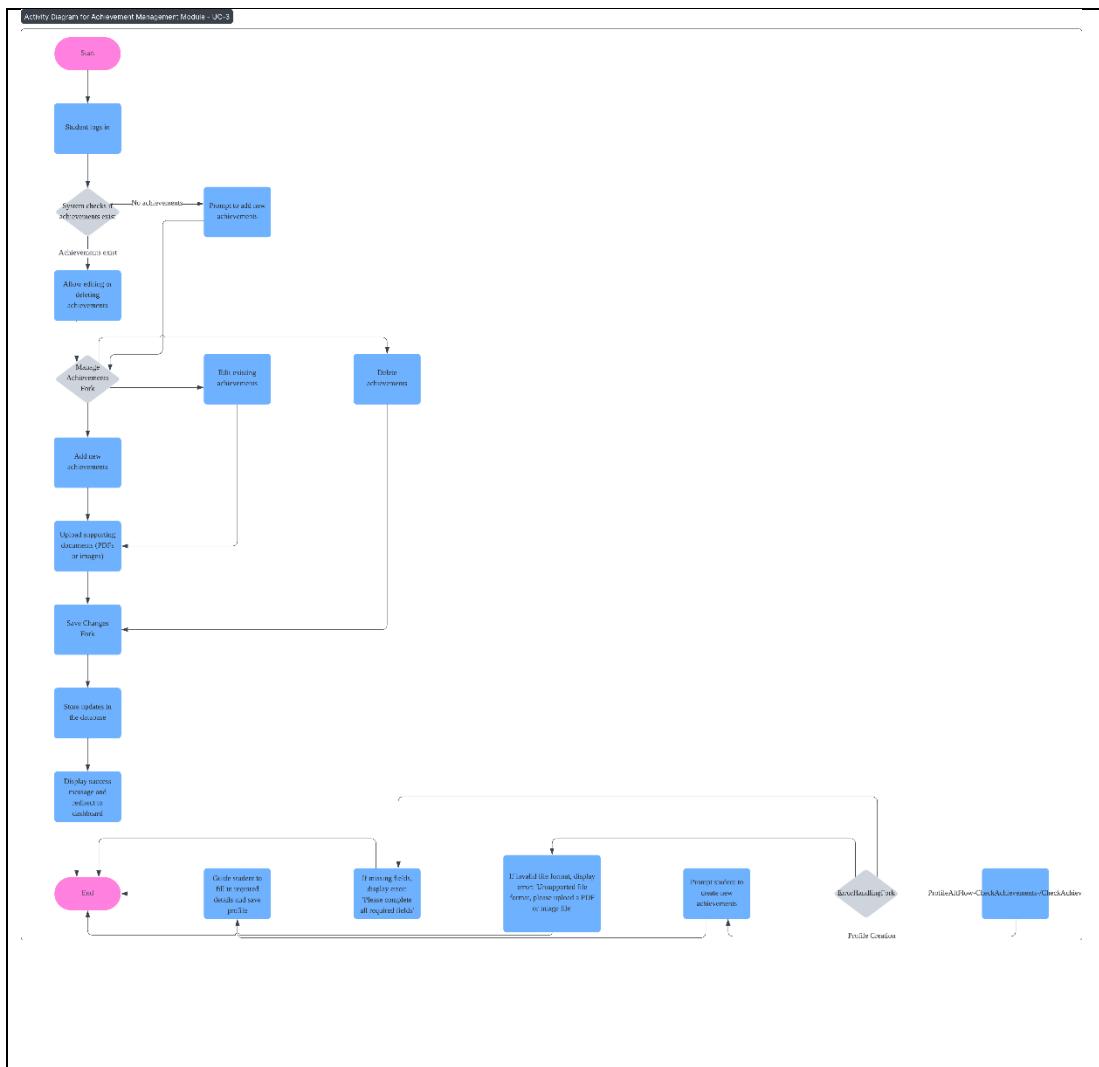
Table 4.3.2.3: Achievement Management Use Case Specification

History Log	1.0.0	Created initial use case			
	1.0.1	Updated normal flow and alternatives flow			
	2.0.0	Finalized use case and related requirements			
Version	2.0.0				
Use Case ID	UC-3				
Use Case Name	Achievement Management				
Created By	Muhammad Noor Azami	Updated By	Muhammad Noor Azami		
Date Created	05/06/2025	Last Revision Date	05/06/2025		
Actors	Students, Lecturers, Administrator				
Description	The achievement management module allows students to add, edit and manage their academic and extracurricular achievements, including uploading supporting documents such as certificates.				

Preconditions	The user must be logged in to access and manage their achievements.		
Post conditions	The student's achievement records are saved and updated in the system database.		
Normal Flow	<ol style="list-style-type: none"> 1. The student logs in to the system. 2. The student navigates to the Achievement Management section. 3. The student can add a new achievement, edit existing achievements, or delete achievements. 4. The student submits the achievement, and the system saves it to the database. 5. If the achievement is successfully saved, the student is notified of the update. 		
Alternative Flow	<p>A1. No Achievement Found</p> <ol style="list-style-type: none"> 1. If the student does not have any achievements in the system, they will be prompted to add new achievements. 2. The student will be guided to the achievement form where they can enter details. 		
Exceptions	<p>E1. Missing Data</p> <ol style="list-style-type: none"> 1. If the student misses any required fields, the system will prompt the student with an error message "Please complete all the required fields before submit your achievement.". <p>E2. Invalid File Format</p> <ol style="list-style-type: none"> 1. If the student uploads a document in an unsupported format, the system will show an error "Unsupported file format, please upload a PDF or image file only.". 		
Related requirement	ID	Requirement	Priority
	FR05-01	The system must allow students to add, edit and delete achievements.	Basic

	FR05-02	The system should allow students to upload supporting documents.	High
	FR05-03	The system must ensure that achievement data is stored securely and is retrievable by the student, lecturer, or administrator.	High
Sequence Diagram:			





(iv) Use Case 4: Reporting and Analytic

The table 4.3.2.4 shows the process of reporting and analytic module for admin to use the dashboard for reporting and analytic work.

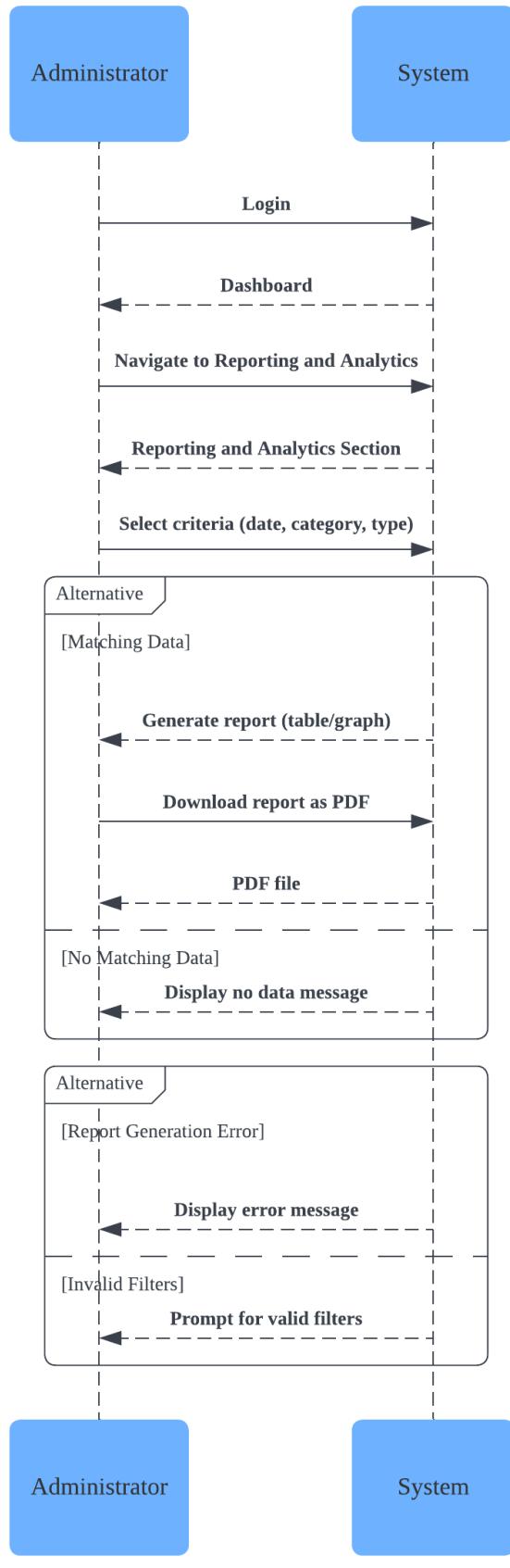
Table 4.3.2.4: Reporting and Analytic Use Case Specifications

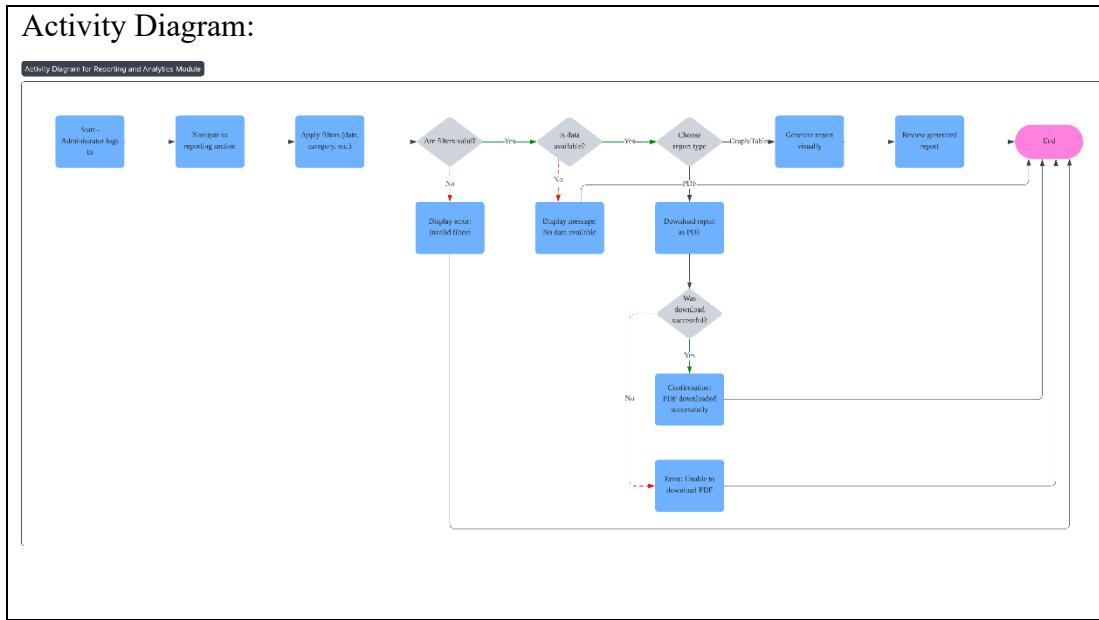
History Log	1.0.0	Created initial use case
	1.0.1	Updated normal flow and alternatives flow
	2.0.0	Finalized use case and related requirements
Version	2.0.0	
Use Case ID	UC-4	

Use Case Name	Reporting and Analytics		
Created By	Muhammad Noor Azami	Updated By	Muhammad Noor Azami
Date Created	05/06/2025	Last Revision Date	05/06/2025
Actors	Administrator		
Description	The reporting and analytics module allows administrators to generate reports on student achievements, talents, and overall performance for decision-making purpose.		
Preconditions	The user must be logged in to access as administrator.		
Post conditions	The system generates a report, which can be downloaded or visualized.		
Normal Flow	<ol style="list-style-type: none"> Administrator logs in to the system. The administrator navigates to the reporting and analytics section. The administrator selects criteria for generating report, such as data, category and achievement. The system processes the request and generates a report based on the selected criteria. The report can be display as graph or table format, downloaded as PDF file. 		
Alternative Flow	<p>A1. No Data Available</p> <ol style="list-style-type: none"> If no data matches the selected criteria, the system will display a message “No data available, please adjust the filter.”. 		
Exceptions	<p>E1. Report Generation Error</p> <ol style="list-style-type: none"> If there's an error in generating the report, the system will display an error message “There was issue generating the report, please try again.”. <p>E2. Invalid Filters</p> <ol style="list-style-type: none"> If the administrator selects invalid or incompatible filters, the system will display and error “Invalid filter selection, please select valid criteria.”. 		
Related requirement	ID	Requirement	Priority
	FR05-01	The system must allow administrators	Basic

		to filter and generate reports based on student data.	
	FR05-02	The system should generate reports in visual formats for better understanding.	High
	FR05-03	The system should allow downloading reports in various formats.	High
Sequence Diagram:			

Sequence Diagram for Reporting and Analytics Module Involving Administrator





(v) Use Case 5: Talent Showcase and Posting Module

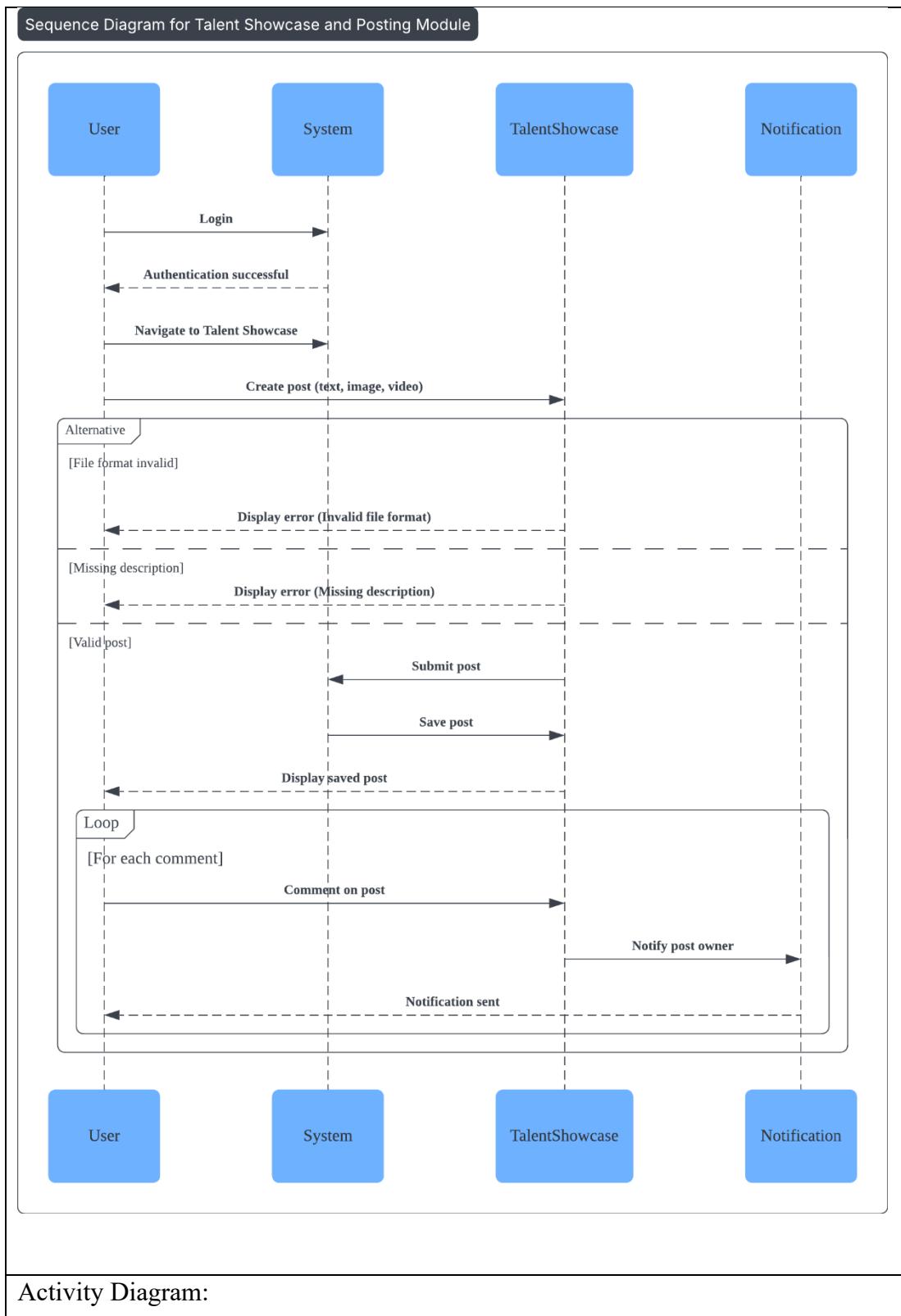
Table 4.3.2.5 shows talent showcase and posting modules for students and lecturers be able to be posting anything related to their talent or showcase to everyone and receive feedback comment of posting in real time.

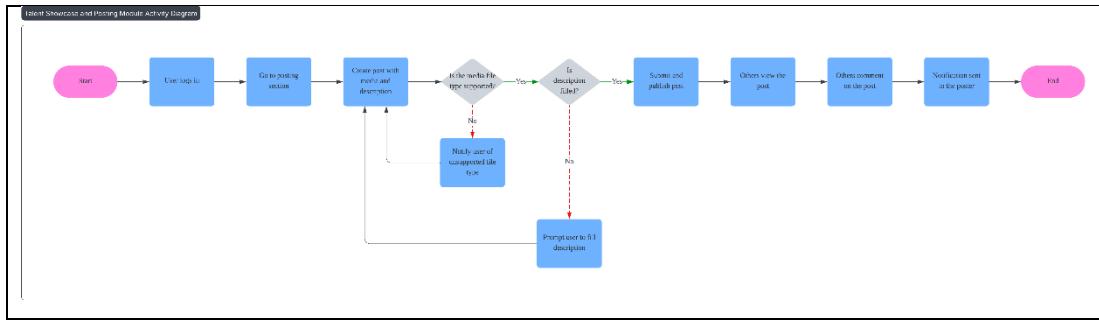
Table 4.3.2.5: Talent Showcase and Posting Module Use Case Specifications

History Log	1.0.0	Created initial use case			
	1.0.1	Updated normal flow and alternatives flow			
	2.0.0	Finalized use case and related requirements			
Version	2.0.0				
Use Case ID	UC-5				
Use Case Name	Talent Showcase and Posting				
Created By	Muhammad Noor Azami	Updated By	Muhammad Noor Azami		
Date Created	05/06/2025	Last Revision Date	05/06/2025		
Actors	Students, Lecturers, Administrator				
Description	The Talent Showcase and Posting module allows both students and lecturers to upload and post content (text, images, videos) to showcase their talents. They can also				

	comment on each other's posts to provide feedback and interact.		
Preconditions	The user must be logged in to the system.		
Post conditions	The posted content is successfully uploaded and saved to the system, the feedback is stored in the system.		
Normal Flow	<ol style="list-style-type: none"> 1. Student logs in to the system. 2. The student navigates to the talent showcase and posting section. 3. The student selects an option to create a new post. 4. The student submits the post, and the system saves the content. 5. The post is displayed in the system, visible to other students, lecturers. 6. Student, and lectures can view the post and provide feedback by commenting. 7. The student receives feedback notifications on the post. 		
Alternative Flow	<p>A1. No Content Posted</p> <ol style="list-style-type: none"> 1. If the user has no content to post, they will be prompted with a message “Please upload content if you have.”. 2. The user can then select to upload new content. 		
Exceptions	<p>E1. Invalid File Format</p> <ol style="list-style-type: none"> 1. If the user uploads an invalid format, the system will display an error message “Unsupported file format, please upload image or video file.”. <p>E2. Missing Description</p> <ol style="list-style-type: none"> 1. If the user posts without providing a description or content, the system will prompt “Please provide a description and upload content to post.”. 		
Related requirement	ID	Requirement	Priority
	FR08-01	The system must allow students and lecturers to post content.	High

	FR08-02	The system should allow users to comment and provide feedback on the posts.	High
	FR08-03	The system should send notifications to the post owner when new feedback is posted	Medium
Sequence Diagram:			





4.3.4 Class Diagram

A class diagram is a type of UML diagram that visually represents the structure of a system by showing its classes, their attributes, methods, and relationships. It's used in object-oriented software design to model the static structure of a system.

Figure 4.3.4 shows UML diagram for overall Student Talent Profiling App with labelled data type to use for better workflow when developing the system app.

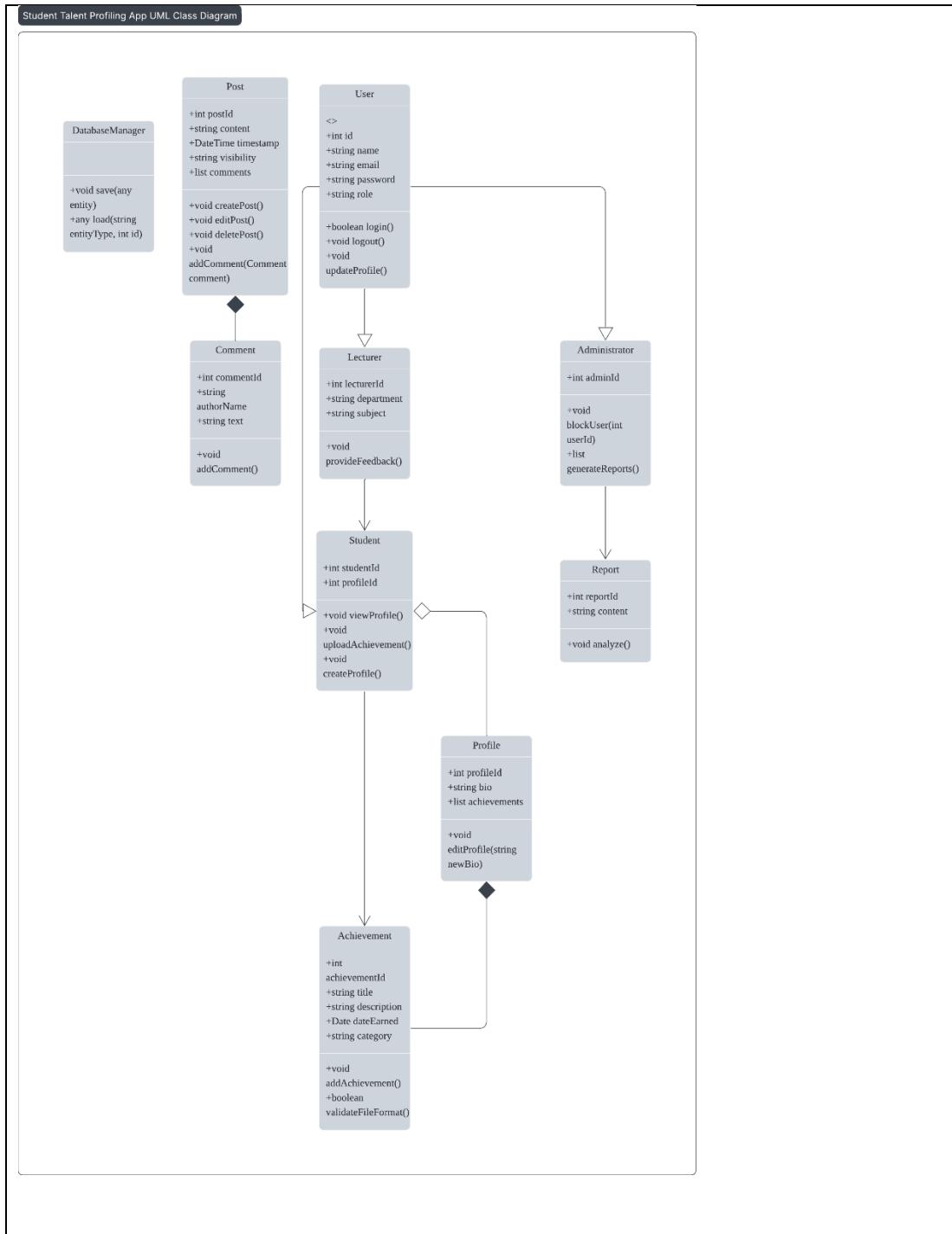


Figure 4.3.4: Class Diagram Student Talent Profiling App

4.3.5 Entity Relationship Diagram

An Entity Relationship Diagram (ERD) is a visual representation of how different entities (objects or concepts) relate to each other in a system. ERDs are commonly used in database design to model the structure of a database and ensure data integrity. In this system, all modules with their own database model is designed to work together

and keep the database linked with each other while maintaining data integrity in flow system.

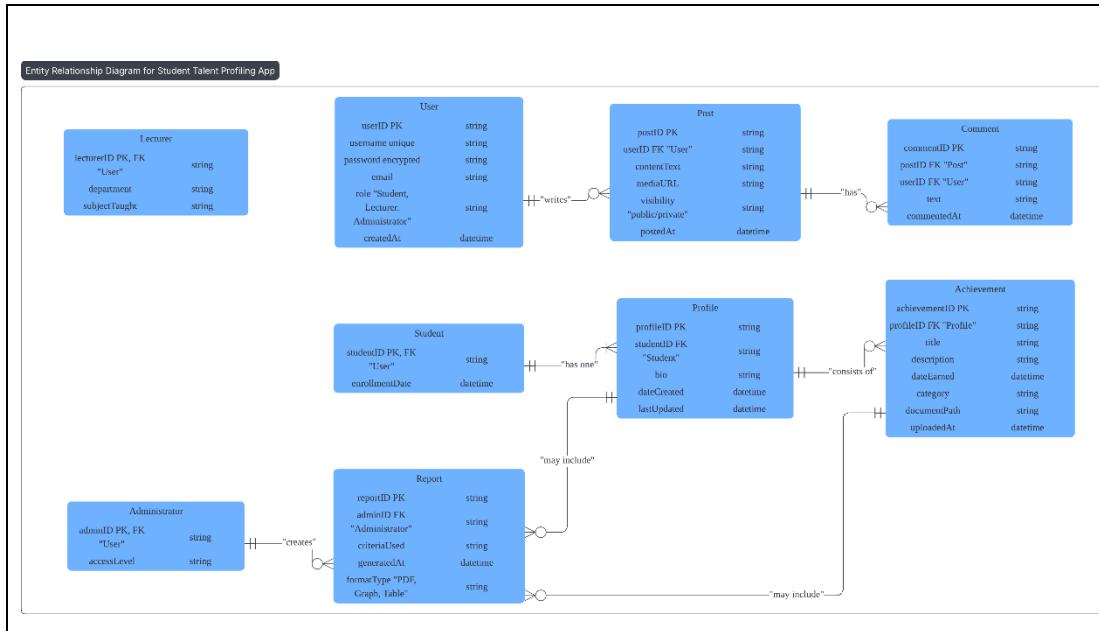


Figure 4.3.5: Entity Relationship Diagram for Student Talent Profiling App

4.3.6 Flowchart

A flowchart is a diagram that shows the steps in a process. It's used to visualize, analyze, and communicate processes. Figure 4.3.6 shows a flowchart for the Student Talent Profiling App from start to finish when using the app system.

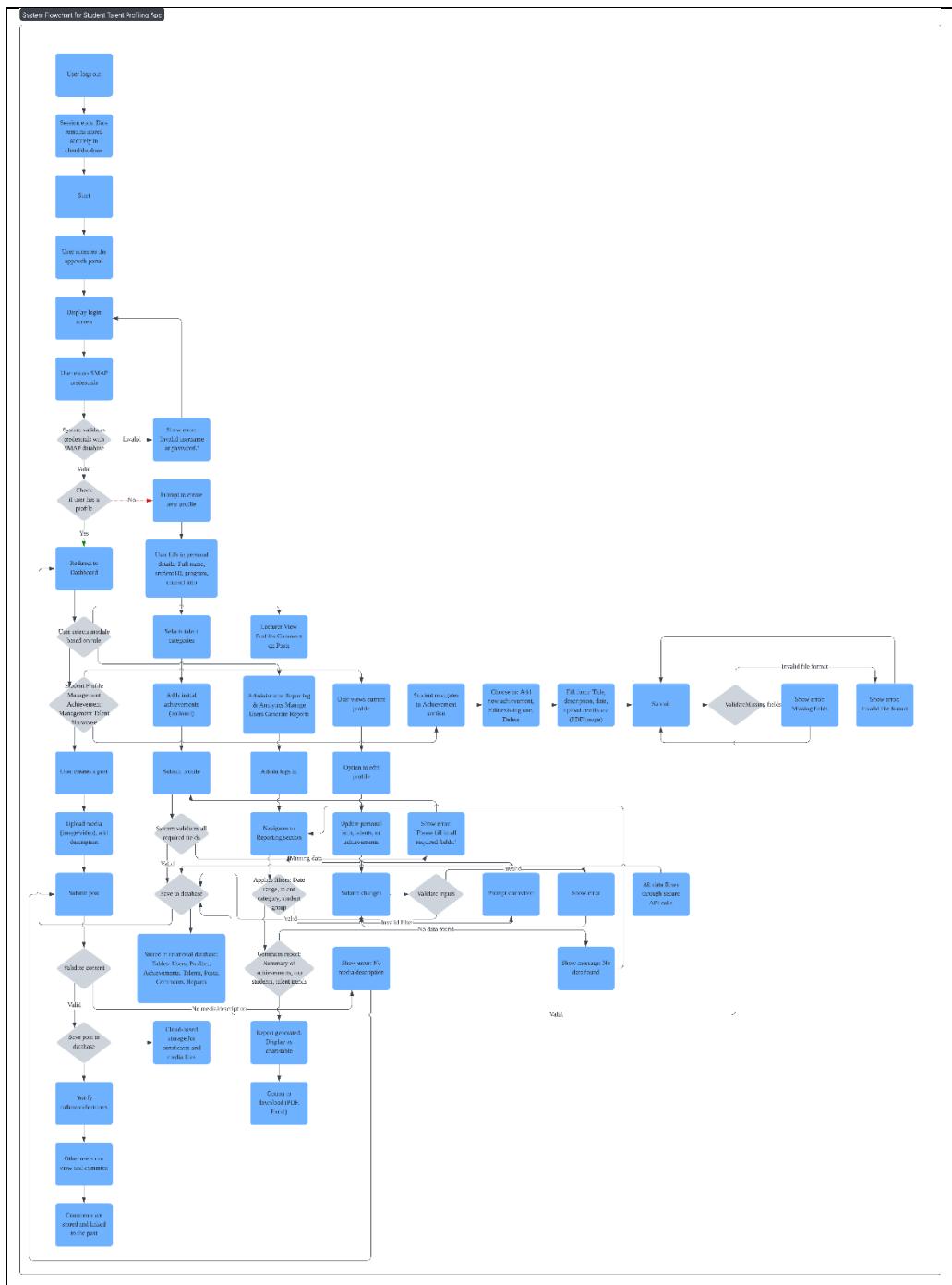


Figure 4.3.6: Student Talent Profiling App Flowchart