

# SCHOOL OF NATURAL APPLIED SCIENCE

## DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY (CSIT)

**PROJECT 3 (NPRJ631) – 2025**

**SUPERVISOR: DR TITE TUYIKEZE**



**SOL PLAATJE  
UNIVERSITY**



**COVER PAGE: CONTENTS AND LAYOUT**

# SCHOOL OF NATURAL APPLIED SCIENCE

## Name of Document:

Phase 2

## Name of the System

**Bursary Home: Streamlining Bursary Applications in South Africa**



**SOL PLAATJE  
UNIVERSITY**

## Group Names

	Student Number	Surname	First Name
1	202242728	Mmusi	Thabang
2	202106983	Itumeleng	Reotshepile Mompoti
3	202211422	Diutlwileng	Gopolang Rodney
4	202344310	Molatedi	Palesa Maikano
5	202305752	Makhwiting	Kabelo Frank

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**PROJECT (NRPJ631) - 2025**

Item	Description of Mark	Maximum Possible mark	Marks Allocated (Examiner)	Comment 1	Comment 2
1	<b>Cover and Contents Pages</b>				
	Title	1			
	Cover Page	2			
	Table of Contents	2			
2	<b>System Functional &amp; Non Functional Requirements</b>				
	System Non-functional Requirements (Reliability, availability, security, maintainability, Portability, Performance)	15			
	Product Features (Functional Requirements)	15			
3	<b>System Modelling</b>				
	Development a context diagram	5			
	Architectural design (Identify major components that make up the system and their interactions, and then may organize the components using an architectural pattern such as layered (three layers) or client-server model)	15			
	System design models (Use Case Diagram, Activity diagram, State diagram, Class diagram, Sequence diagram)	25			
4	<b>Project Management</b>				
	Tasks (Provide a work breakdown with clear description of each task. (Each task should have the following: Deliverable(s), Milestones, resources needed, dependencies and constraints, risks and contingencies)	10			

	Create a Gantt chart for the project	5			
5	<b>Overall Document Presentation</b>				
	Document layout, fonts, paragraph and bullets alignments etc	5		N/A	N/A
<b>Total Marks</b>		<b>100</b>			
<b>Comments (Please provide comments where applicable)</b>					
Examiner					

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## System Functional & Non Functional Requirements

### Functional Requirements

- **User Authentication:**
  - **Description:** Secure user login and registration for students, bursary providers, and university personnel.
  - **Importance:** Ensures authorized access and data security.
  - **Examples:** Email/password registration (with password strength requirements: minimum 8 characters, including uppercase, lowercase, number, and symbol), OTP, two-factor authentication, social login (Google, Facebook).
- **Bursary Search:**
  - **Description:** Functionality to search for bursaries based on criteria like location, course of study, eligibility requirements, and deadlines.
  - **Importance:** Helps students efficiently find relevant bursaries.
  - **Examples:** Filtering options by field of study, location, specific requirements, bursary value, closing date. Sorting options by relevance, closing date, bursary amount. Includes fuzzy search to handle typos.
- **Application Submission:**
  - **Description:** Allows students to submit applications directly through the platform, including document uploads and personal statements.
  - **Importance:** Streamlines the application process and eliminates paperwork.
  - **Examples:** Online application forms, document upload capabilities (PDF, DOCX, JPG files up to 5MB), progress tracking. Rich text editor for personal statements with a character limit of 1000 characters.
- **Tracking System:**
  - **Description:** Enables students to monitor the status of their applications (e.g., pending, under review, successful, rejected).
  - **Importance:** Provides real-time updates and reduces uncertainty.
  - **Examples:** Application status indicators (Received, Under Review, Shortlisted, Interviewing, Successful, Rejected), email notifications sent immediately upon status change, progress dashboards.
- **Provider Dashboard:**
  - **Description:** A dedicated dashboard for bursary providers to manage applications, communicate with students, and generate reports.
  - **Importance:** Facilitates efficient application review and management.

- **Examples:** Application filtering by defined criteria, bulk communication tools (email, SMS), reporting features (application statistics, demographics, success rates, export to CSV/Excel). Ability to define custom application criteria.
- **University Portal:**
  - **Description:** Dedicated interface for university staff to manage bursary listings, access student data (with appropriate permissions), and generate reports.
  - **Importance:** Streamlines bursary management and supports student success.
  - **Examples:** Ability to add, edit, and remove bursary listings. Access to anonymized student data (e.g., GPA, field of study) for matching with bursary criteria (with appropriate permissions and data privacy safeguards). Reporting features on bursary usage and student outcomes (graduation rates, employment rates). Interface for providing bursary providers feedback on student performance.
- **Integration with SIS:**
  - **Description:** Ability to securely exchange data with university student information systems (e.g., student enrollment status, academic records) and to verify student eligibility.
  - **Importance:** Streamlines data management and reduces manual effort.
  - **Examples:** API integration with common SIS platforms (e.g., Banner, PeopleSoft). Secure data transfer protocols (HTTPS, SFTP). Automated verification of student enrollment status and academic standing.
- **Bursary Promotion Tools:**
  - **Description:** Features to easily promote relevant bursary opportunities to targeted student groups (e.g., based on field of study, academic performance).
  - **Importance:** Enhances student awareness of funding opportunities.
  - **Examples:** Email marketing tools. Integration with university learning management systems (LMS). Targeted notifications based on student profiles.

## **Non-Functional Requirements**

- **System Scalability:**
  - **Description:** The system should be able to handle increasing numbers of users and applications without performance degradation.
  - **Importance:** Ensures the system can accommodate future growth and peak usage periods.
  - **Examples:** Cloud-based infrastructure, scalable database architecture, load balancing. The system must support at least 10,000 concurrent users and handle 5,000 new applications per day without performance degradation.

- **Data Security:**
  - **Description:** Ensure confidentiality, integrity, and availability of user data with encryption and secure protocols.
  - **Importance:** Protects sensitive information and maintains user trust.
  - **Examples:** HTTPS, data encryption (AES-256), regular security audits, access controls (role-based access control), compliance with POPIA. Compliance with university data privacy policies.
- **Performance:**
  - **Description:** Fast response times for all system functions.
  - **Importance:** Enhances user experience and reduces frustration.
  - **Examples:** Page load times under 3 seconds, optimized database queries, caching mechanisms. 90% of page loads should occur in under 2 seconds. Search queries should return results in under 1 second. Application submission shall be completed within 5 seconds.
- **User-Friendly Interface:**
  - **Description:** Intuitive and easy-to-navigate interface for all users, especially those with limited technical skills.
  - **Importance:** Increases user adoption and satisfaction.
  - **Examples:** Clear layouts, simple navigation, mobile responsiveness, accessibility features (WCAG compliance, screen reader compatibility, keyboard navigation).
- **Availability and Reliability:**
  - **Description:** 24/7 availability with redundancy and failover mechanisms.
  - **Importance:** Ensures continuous operation, especially during critical application periods.
  - **Examples:** Cloud-based hosting with high availability, automatic backups, disaster recovery plan. The system should maintain 99.9% uptime, excluding scheduled maintenance. Daily backups with offsite storage.

### **Additional Requirements**

- **Administration:**
  - **Description:** Secure administrative interface for managing users, roles, system configuration, bursary content, and platform settings.
  - **Importance:** Allows for proper system maintenance and control.

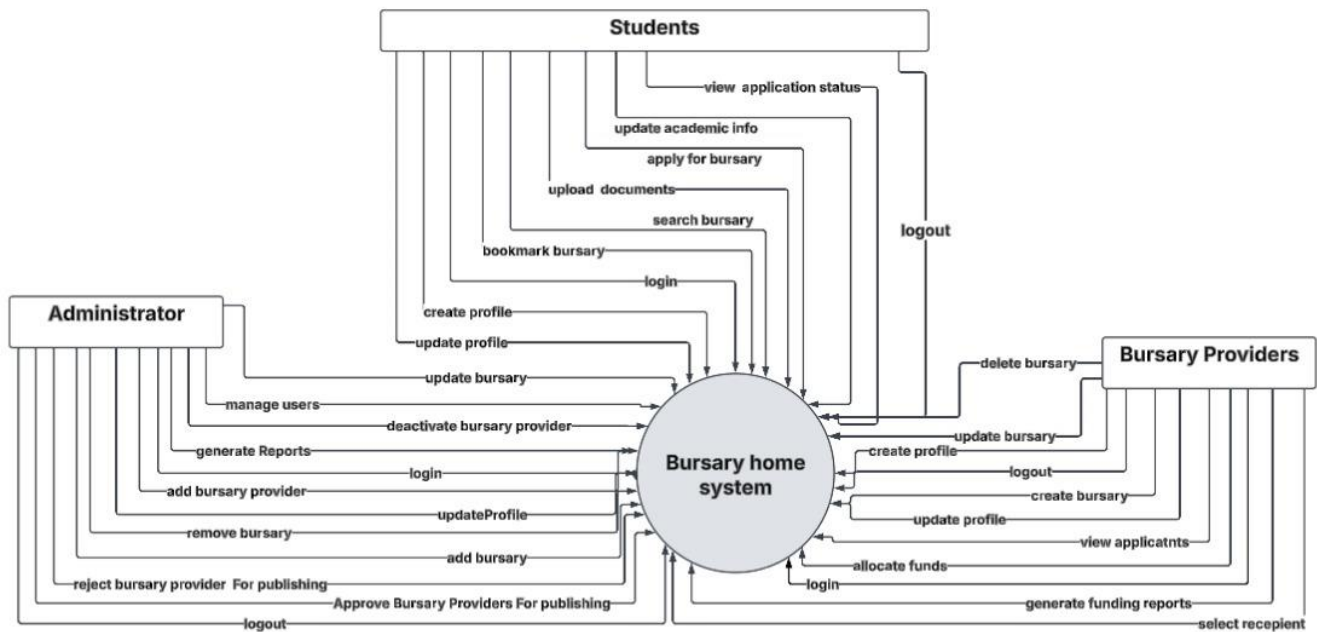
- **Examples:** User management (add, edit, delete users), Role Management (define and assign roles), system configuration (setting parameters), content management (managing bursary listings, FAQs, etc.).
- **Reporting:**
  - **Description:** The system should generate reports for students, bursary providers, and universities.
  - **Importance:** Helps students track and reflect on applications, helps providers with performance reviews, and helps universities with student success tracking.
  - **Examples:** Application statistics, demographics, success rates, export to CSV/Excel. Reports on bursary usage and student outcomes (graduation rates, employment rates, etc.).
- **Accessibility:**
  - **Description:** Ensure the platform is accessible to users with disabilities.
  - **Importance:** Inclusivity and compliance.
  - **Examples:** WCAG 2.1 compliance. Screen reader compatibility, keyboard navigation.



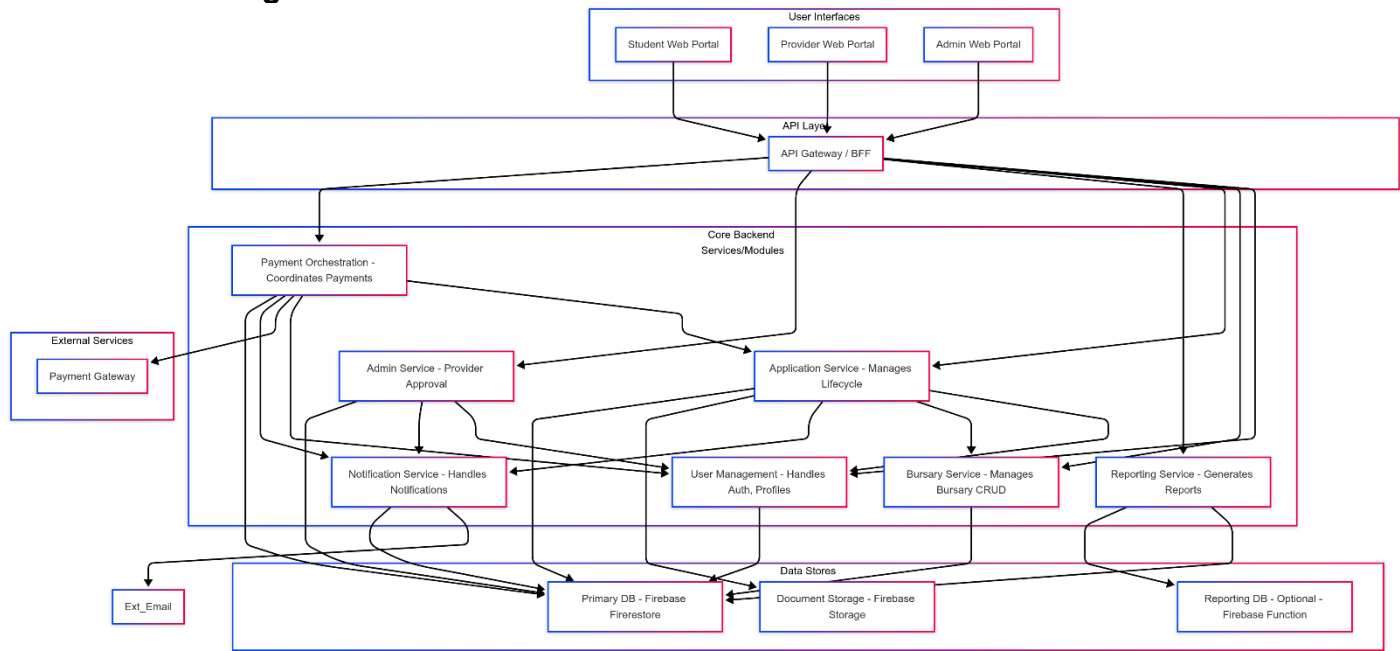
## System Modeling

### Context Diagram

Context Diagram  
Bursary Provider



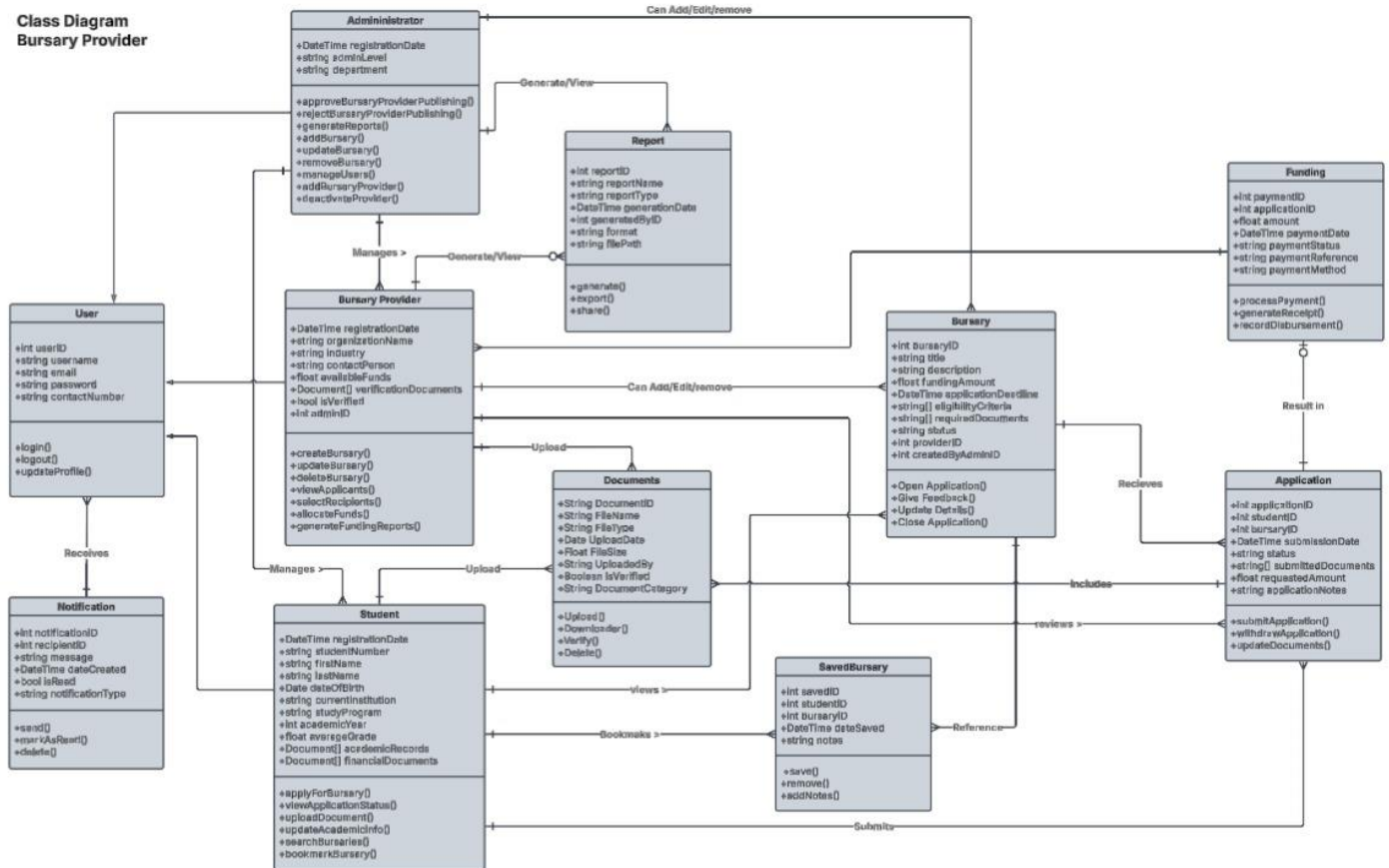
## Architectural Diagram



# System Design Models

## Class Diagram

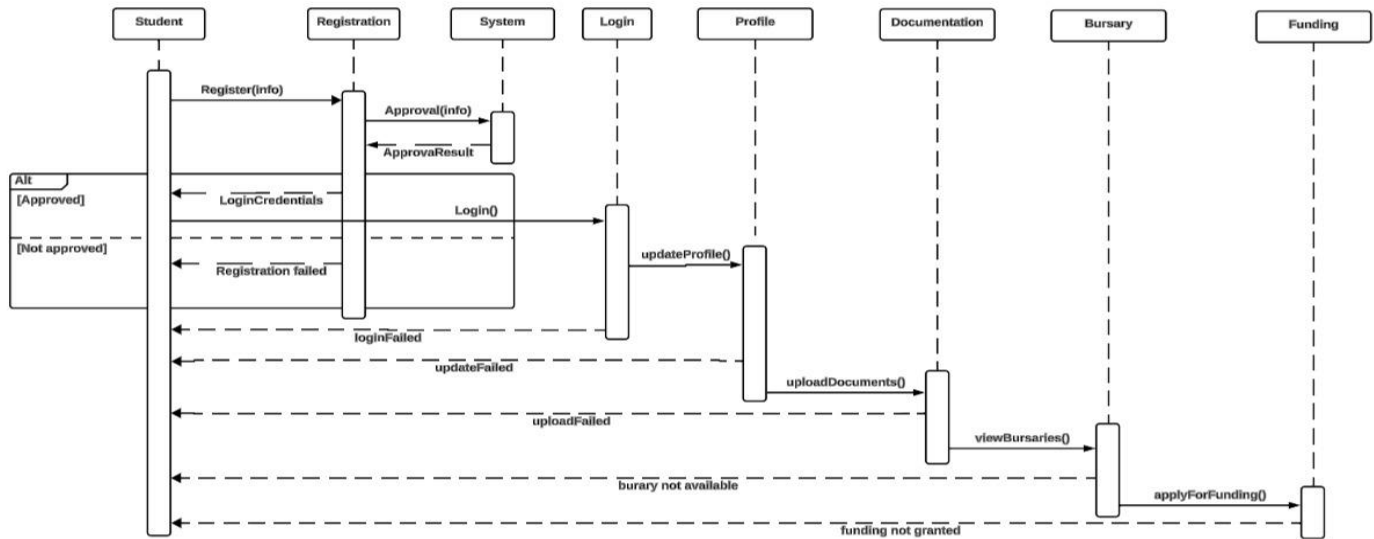
Class Diagram  
Bursary Provider



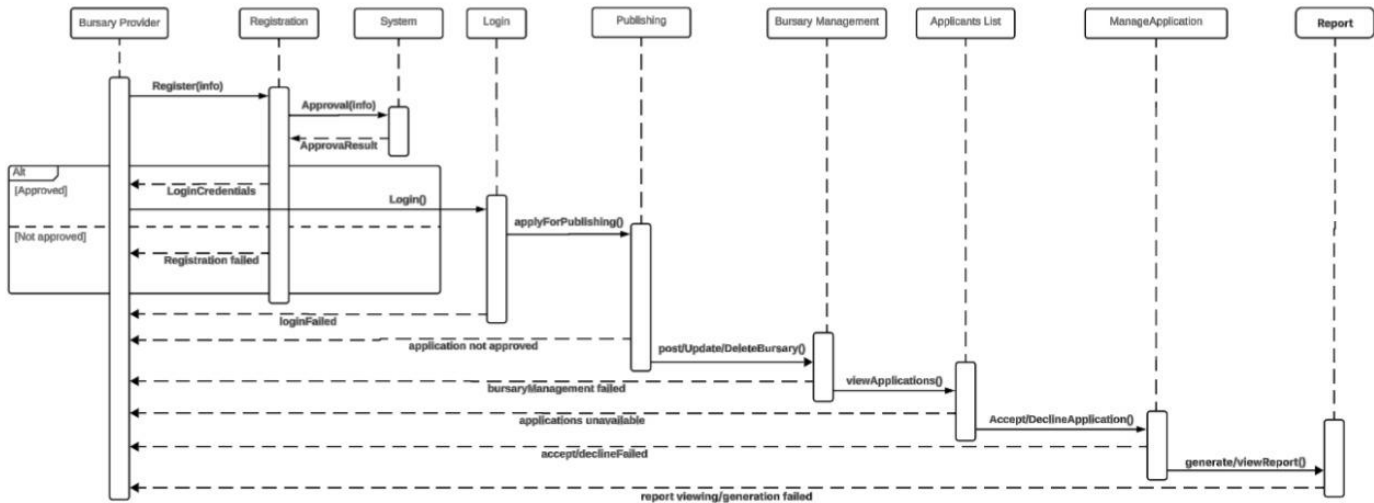


## Sequence diagrams

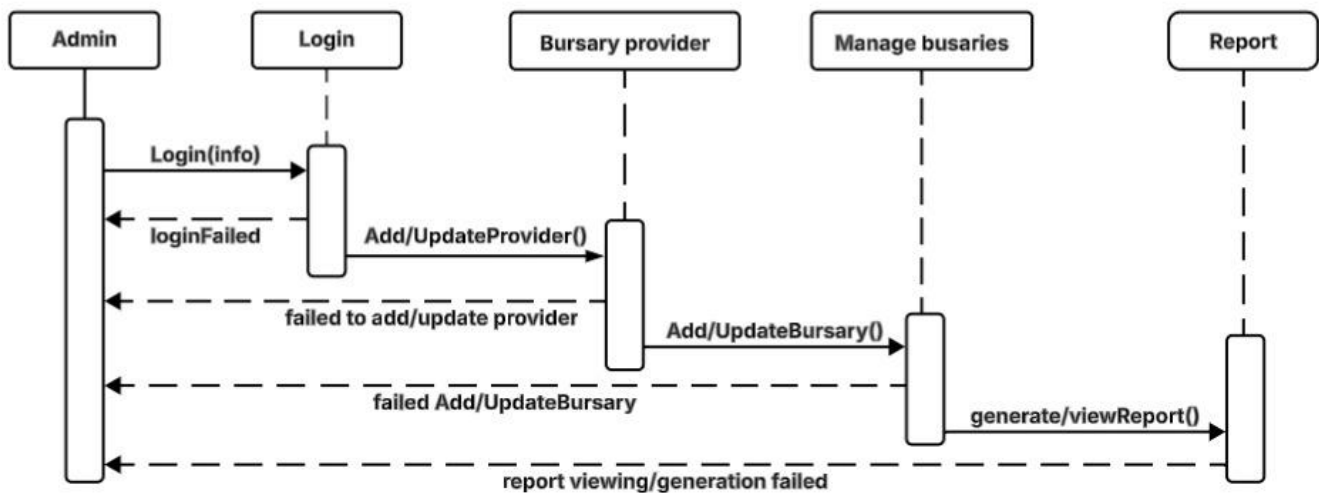
Sequence Diagram For Students



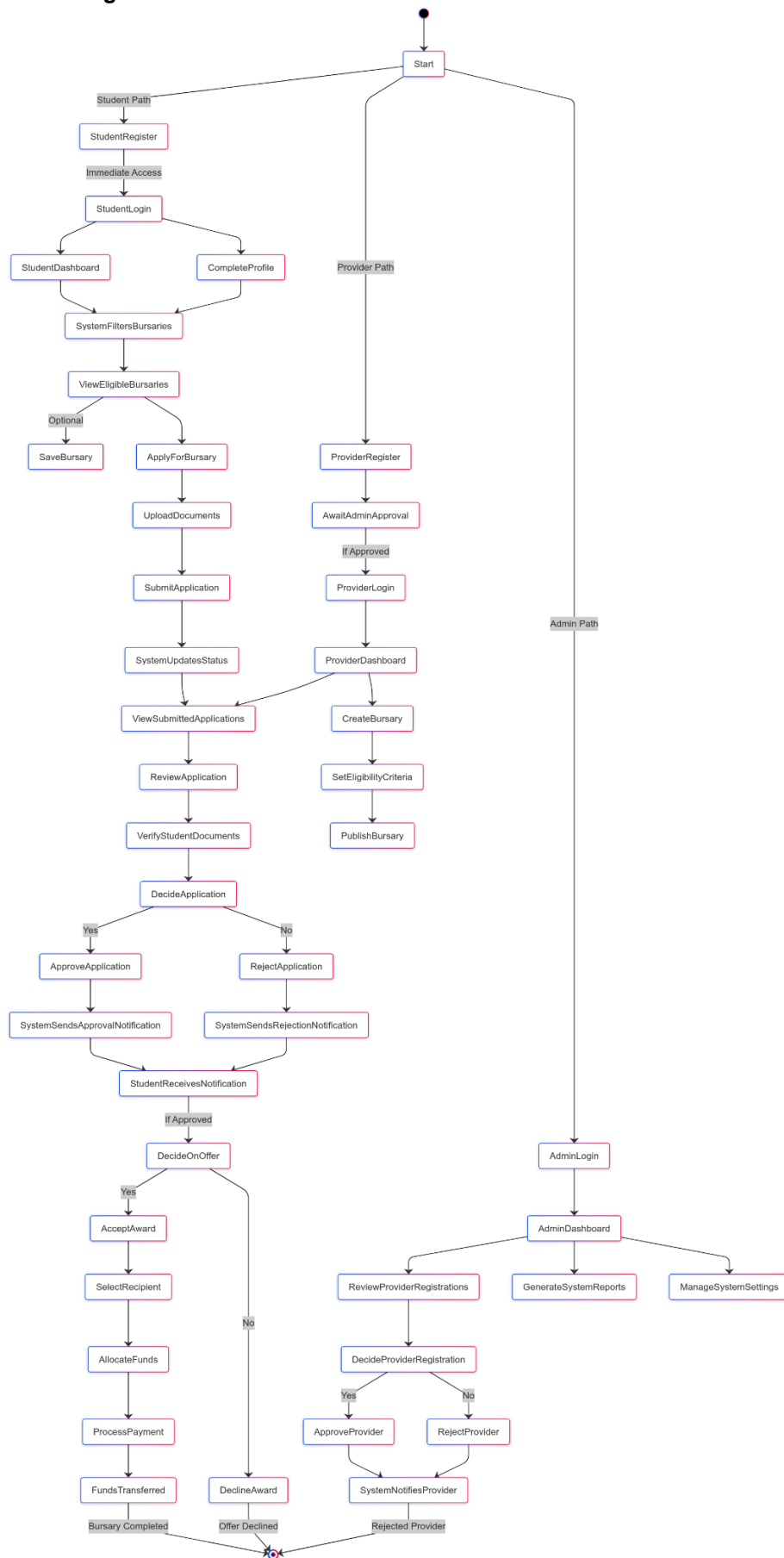
Sequence Diagram For Bursary Provider



Sequence Diagram For Admin

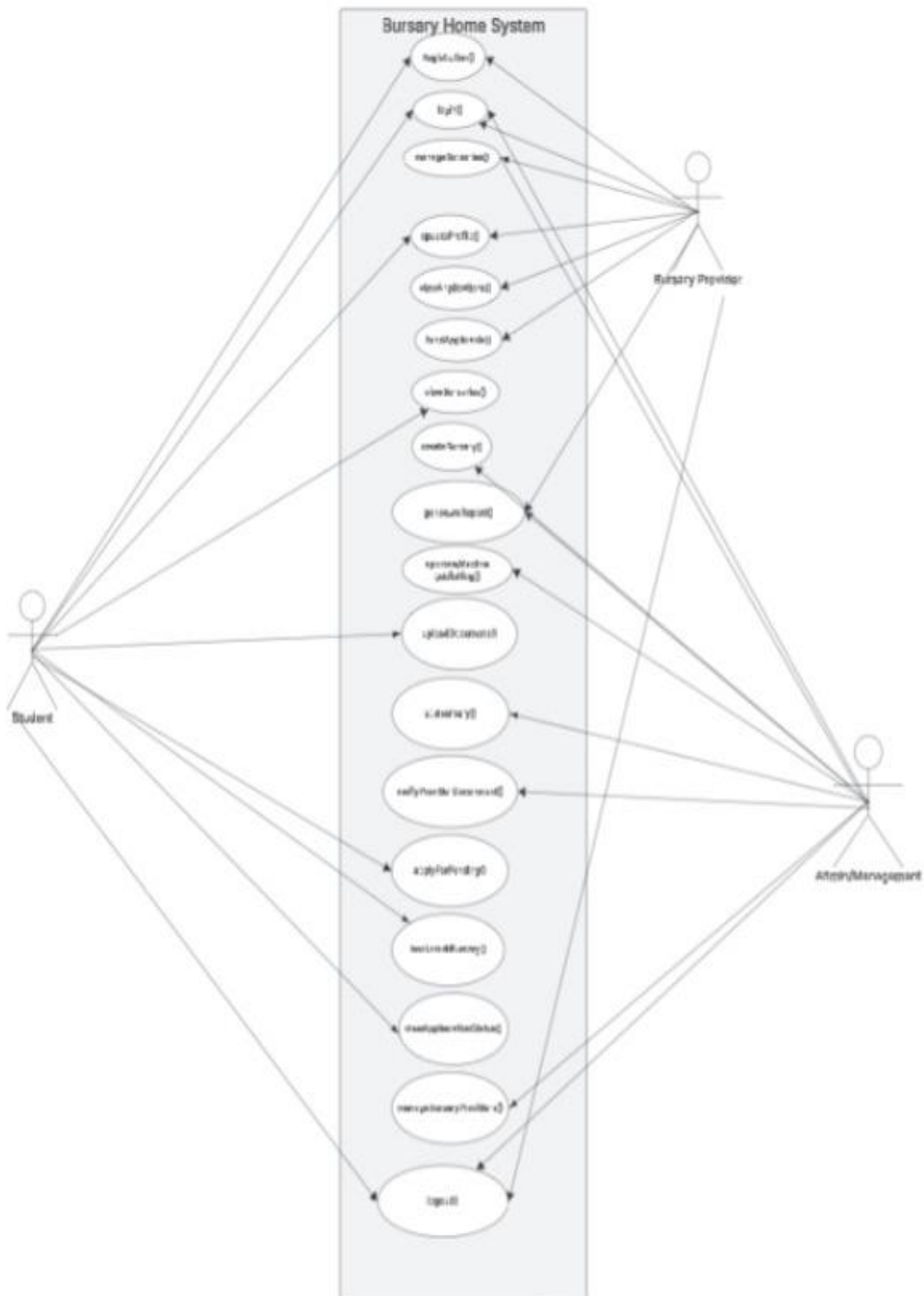


## State Diagrams



## Usecase & State Diagrams

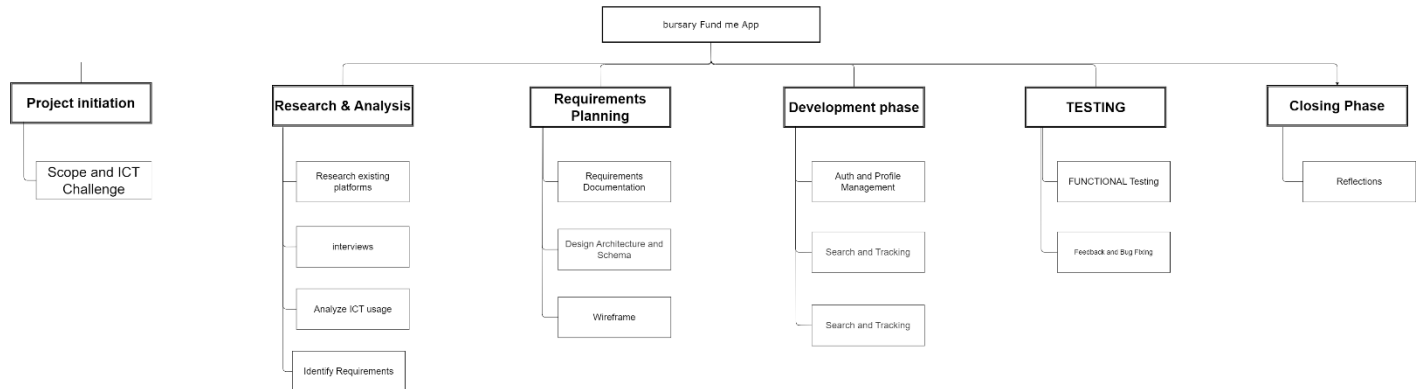
### Use case diagram



# Project Management

## Work breakdown Structure

### WORK BREAKDOWN STRUCTURE



## Gantt Chart

