Software Requirements Specification

for

One Stop Student Service Center

Software Engineering - A

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Revision History

Name	Date	Reason For Changes	Version
M Abdur Rafey	1-04-2024	Initial document with all the diagrams	1.0
Mir Mujtaba	6-04-2024	Reviewed and added non-functional requirements	1.1
Ayra Alamdar	7-04-2024	Updated all information and finalized the document	1.2

1. Introduction

1.1 Purpose

Our program's aim is to give the administrative staff, faculty, and the students a platform where they can manage and use a varying range of services related to their academic and administrative tasks. This SRS is mainly focused on defining the scope and the necessary specifications to achieve the goals of our program.

1.2 Document Conventions

This SRS follows the standard SE conventions for specifying requirements. Every requirement is identified and mentioned clearly by using a unique ID, title, user story and the acceptance criteria. All the requirements are categorized by types to help in facilitating with development and testing. Priority levels for requirements are also implemented where they're needed.

1.3 Intended Audience and Reading Suggestions

The target audience for this document are developers, project managers, professionals in quality assurance, and the stakeholders who are a part of the development of our program. The user stories and the acceptance criteria can be accessed for helping while developing. Project managers can use this document to plan sprints and allocate resources. Testers should refer to acceptance criteria for validation. Stakeholders can gain an understanding of the system's functionalities and scope.

1.4 Product Scope

The One Stop Service web application aims to provide a comprehensive and user-friendly interface that integrates multiple administrative and academic services into a centralized platform. The scope includes features such as form categorization using AI models, workflow automation for request processing, real-time tracking of requests, event management, financial queries, and academic support services like transcript issuance and admit card management. This application will enhance efficiency, transparency, and user experience across different user roles within the institution.

1.5 References

- One Stop Service Vision and Scope Document
- .NET Framework Documentation
- Scrum Methodology Guidelines
- AI Model Documentation (for form categorization and urgency determination)

2. Overall Description

2.1 Product Perspective

The One Stop Service web application is a new, self-contained product aimed at providing a centralized platform for students and staff within an educational institution. It is designed to streamline and manage various administrative and academic services, integrating disparate systems and processes into a unified interface. The product will interface with existing databases and systems within the institution to gather and manage data related to student requests, financial queries, event management, and academic support services.

2.2 Product Functions

- Form categorization using AI models
- Urgency determination for request prioritization
- Tracking and managing degree issuance processes
- Transcript and admit card issuance
- Financial queries resolution
- Event management coordination
- Scholarship program guidance
- Complaint submission and tracking
- Appointment booking
- Semester freeze support
- User access control and authorization management
- Payment confirmation and management

2.3 User Classes and Characteristics

User classes for the One Stop Service application include:

- Students: Engage with the platform for degree issuance, complaint submission, transcript requests, and event bookings.
- Staff Members: Utilize the system to categorize forms, manage requests, assist students with financial queries, and coordinate events.
- Administrators: Oversee and manage all system operations, including access control, payment management, and overall system functionality.
- Directors and Finance Committee: Monitor system statistics, manage urgent requests, and make decisions on financial matters.

Each user class has distinct privileges and access levels based on their roles and responsibilities within the institution.

2.4 Operating Environment

The One Stop Service application will operate within the following environment:

- Hardware Platform: Compatible with standard computing infrastructure used in educational institutions.
- Operating System: Majority of the major operating systems are supported.
- Software Components: Utilizes the .NET framework, AI models for form categorization, and relational databases for data management.

- Interface Compatibility: Ensures compatibility with common web browsers (Chrome, Firefox, Safari) and mobile devices.

2.5 Design and Implementation Constraints

- Utilization of .NET framework for development.
- Integration with existing databases and systems within the educational institution.
- Adherence to security standards and protocols for user data protection.
- Compatibility with common browsers and mobile devices.
- Compliance with institutional policies and regulations.

2.6 User Documentation

User documentation components to be delivered with the software include:

- User manuals for students, staff, and administrators.
- Online help and tutorials accessible within the application interface.
- Release notes and version history for administrators and technical users.

2.7 Assumptions and Dependencies

Assumptions:

- Availability of necessary hardware and software infrastructure within the institution.
- AI models for form categorization and urgency determination perform as expected.
- Adherence to institutional policies and regulations during development.

Dependencies:

- Integration with existing databases and systems within the institution for data exchange.
- Availability of external resources (AI models, databases) for form processing and data management.

3. External Interface Requirements

3.1 User Interfaces

The One Stop Service web application will feature a user-friendly interface designed to accommodate multiple user roles with specific functionalities tailored to their needs:

Student Interface:
- Degree issuance form submission
- Complaint form submission
- Tracking degree issuance progress
- Appointment booking
- Access to scholarship program information

Staff Interface:
- AI-driven form categorization
- Urgency determination for issue prioritization
- Record management for form submissions
- Financial queries resolution
- Event management coordination

Administrator Interface:
- Authorization control and user management
- Oversight of degree issuance processes
- Payment management and confirmation
- Transcript issuance and admit card management
- Reporting and analysis tools

The user interfaces will adhere to established GUI standards, featuring intuitive layouts, standardized buttons for common functions (e.g., submit, cancel), error message displays, and contextual help options. Detailed interface designs will be documented separately in the User Interface Specification.

3.2 Hardware Interfaces

The One Stop Service application will operate on standard computing hardware commonly found in educational institutions, including desktop computers, laptops, and mobile devices. There are no specific hardware interfaces required beyond typical input/output devices (e.g., keyboard, mouse, touchscreen).

3.3 Software Interfaces

The software interface will have the following components:
- .NET Framework: Utilized for application development and runtime environment.
- AI Models: Integrated for form categorization and urgency determination.
- Relational Databases: Used in storing and also managing the data of the application.
- Operating systems: compatible with most of the major operating systems.
- Web browsers: supports most of the major web browsers.

Communication with databases will involve data retrieval and storage for managing user requests and system workflows. Detailed API specifications and data exchange protocols will be documented for seamless integration.

3.4 Communications Interfaces

The One Stop Service application will utilize standard communication protocols for various functions:

- **Email:** Used for sending confirmation messages and notifications to users.
- **HTTP/HTTPS**: Web-based communication for client-server interactions.
- **RESTful APIs:** Facilitates data exchange between the application and external systems.
- **Network Protocols:** Ensures secure data transmission over local network or internet.

Communication standards will adhere to industry best practices for security and data integrity, including encryption for sensitive information and error handling mechanisms to ensure reliable data transfer.

4. System Features

The following system features collectively form the core functionalities of the One Stop Service application, addressing key user needs and enhancing operational efficiency within the institution.

4.1 Degree Issuance Management

4.1.1 Description and Priority

This feature allows students to submit degree issuance requests and track their progress through various stages until completion. It is of high priority to ensure timely and efficient processing of degree-related requests.

4.1.2 Stimulus/Response Sequences

Stimulus: Student submits a degree issuance form through the web application.
Response: System records the submission, assigns a unique identifier, and initiates the processing workflow.

4.1.3 Functional Requirements for Degree Issuance Management

REQ-1: Provide a user-friendly interface the degree issuance form for ease of use.
REQ-2: Capture and store form submissions in the system database.
REQ-3: Assign a unique tracking ID to each submission for status tracking.
REQ-4: Notify students of any updates or changes in the degree issuance process.
REQ-5: Allow staff members to review, approve, or reject degree issuance requests.
REQ-6: Display the current status of degree issuance requests to students.

4.2 Complaint Submission and Tracking

4.2.1 Description and Priority

This feature enables students to submit complaints regarding academic or administrative issues and allows staff members to track and resolve these complaints efficiently. It is of medium priority to ensure student satisfaction and timely resolution of complaints.

4.2.2 Stimulus/Response Sequences

Stimulus: Student submits a complaint form detailing the issue.
Response: System records the complaint, assigns a reference number to the complaint and notifies staff members for resolution.

4.2.3 Functional Requirements for Complaint Submission

REQ-7: Provide a complaint submission form with fields for issue description and category.
REQ-8: Generate a unique reference number for each submitted complaint.
REQ-9: Notify staff members responsible for complaint resolution.
REQ-10: Allow staff members to update the status of complaints
REQ-11: Notify students of the resolution or status updates on their submitted complaints.

4.3 Event Management Coordination

4.3.1 Description and Priority

This feature allows staff members to coordinate and manage various academic and administrative events, ensuring smooth execution and communication with participants. It is of high priority to facilitate successful event outcomes and enhance institutional reputation.

4.3.2 Stimulus/Response Sequences
Stimulus: Staff member initiates event creation and scheduling.
Response: System creates event records, manages participant registrations, and sends event notifications.

4.3.3 Functional Requirements
REQ-12: Provide an event creation interface with options for specifying event details.
REQ-13: Allow registration management for event participants.
REQ-14: Send event notifications to registered participants regarding schedule changes or updates.
REQ-15: Generate reports on event attendance and feedback for analysis.

4.4 Financial Queries Resolution

4.4.1 Description and Priority
This feature enables staff members to assist students with financial queries, providing prompt and accurate responses to billing and fee-related inquiries. It is of medium priority to ensure financial transparency and student satisfaction.

4.4.2 Stimulus/Response Sequences
Stimulus: Student submits a financial query regarding fees or billing.
Response: System retrieves and displays relevant financial information, allowing staff members to address the query.

4.4.3 Functional Requirements for Financial Queries Resolution
REQ-16: Implement a financial query submission form for students.
REQ-17: Retrieve and display detailed billing information upon query submission.
REQ-18: Allow staff members to update billing statuses or provide clarifications.
REQ-19: Notify students of query resolutions or additional steps required.

4.5 Appointment Booking

4.5.1 Description and Priority
This feature helps students to book online appointments with staff members, reducing wait times and making the administrative processes smoother. It is of medium priority to improve efficiency and accessibility for students.

4.5.2 Stimulus/Response Sequences
Stimulus: Student selects desired appointment slot through the application.
Response: System confirms the booking, updates staff calendars, and sends appointment reminders.

4.5.3 Functional Requirements for Appointments Booking
REQ-20: Display available appointment slots based on staff members' availability.
REQ-21: Allow students to select and confirm appointments.
REQ-22: Update staff calendars with booked appointments.
REQ-23: Send appointment confirmations and reminders to students and staff.

5. Other Nonfunctional Requirements

The following nonfunctional requirements are essential to ensure the performance, security, and usability of the One Stop Service application while meeting regulatory and business rule constraints within the educational institution.

5.1 Performance Requirements

Response Time: The system should respond to all user actions under 3 seconds in normal conditions.
Scalability: The system should handle atleast 1000 users without performance issues.
Data Retrieval: All database queries should be executed in 1 second to ensure timely info retrieval.
Event Handling: Event registration and management functions should operate efficiently even during peak usage periods.

5.2 Safety Requirements

Data Integrity: Ensure all user data secure and protected against malware attacks.
Error Handling: Implement effective error handling mechanisms to prevent system crashes.
Compliance: Adhere to data protection regulations and privacy policies to protect user data.

5.3 Security Needs

User Authentication: Implement secure login for user access.
Data Encryption: Use encryption protocols to protect data transmission over the network.
Access Control: Ensure users only have access to allowed functionalities based on their roles.
Audit Trail: Maintain audit logs to track system access and changes, for accountability and monitoring.

5.4 Software Quality Attributes

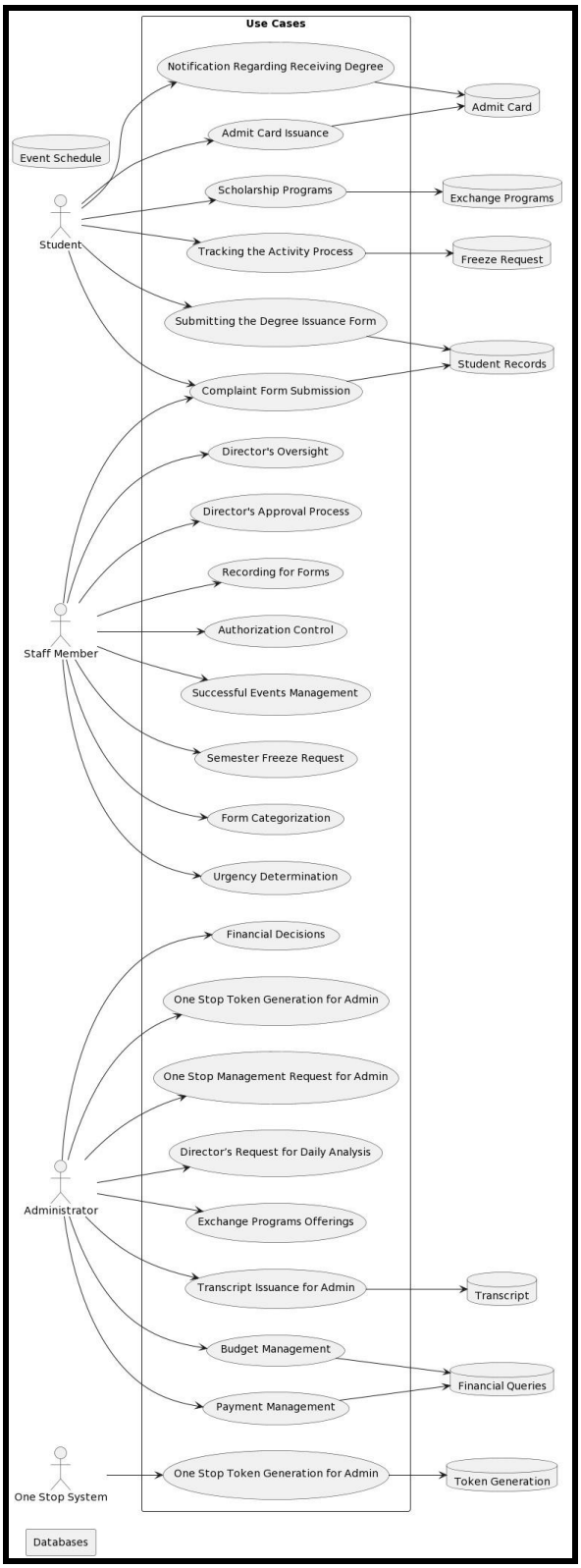
Maintainability: Create a system with thorough documentation in its code to support easy updates and modifications in the future.
Usability: Develop user interfaces with clear navigation and informative feedback.
Reliability: Implement robust error handling and automated recovery procedures.
Interoperability: Ensure compatibility with all major web browsers and operating systems.
Portability: Design the application for deployment on majority platforms with least amount of adjustments required.

5.5 Business Rules

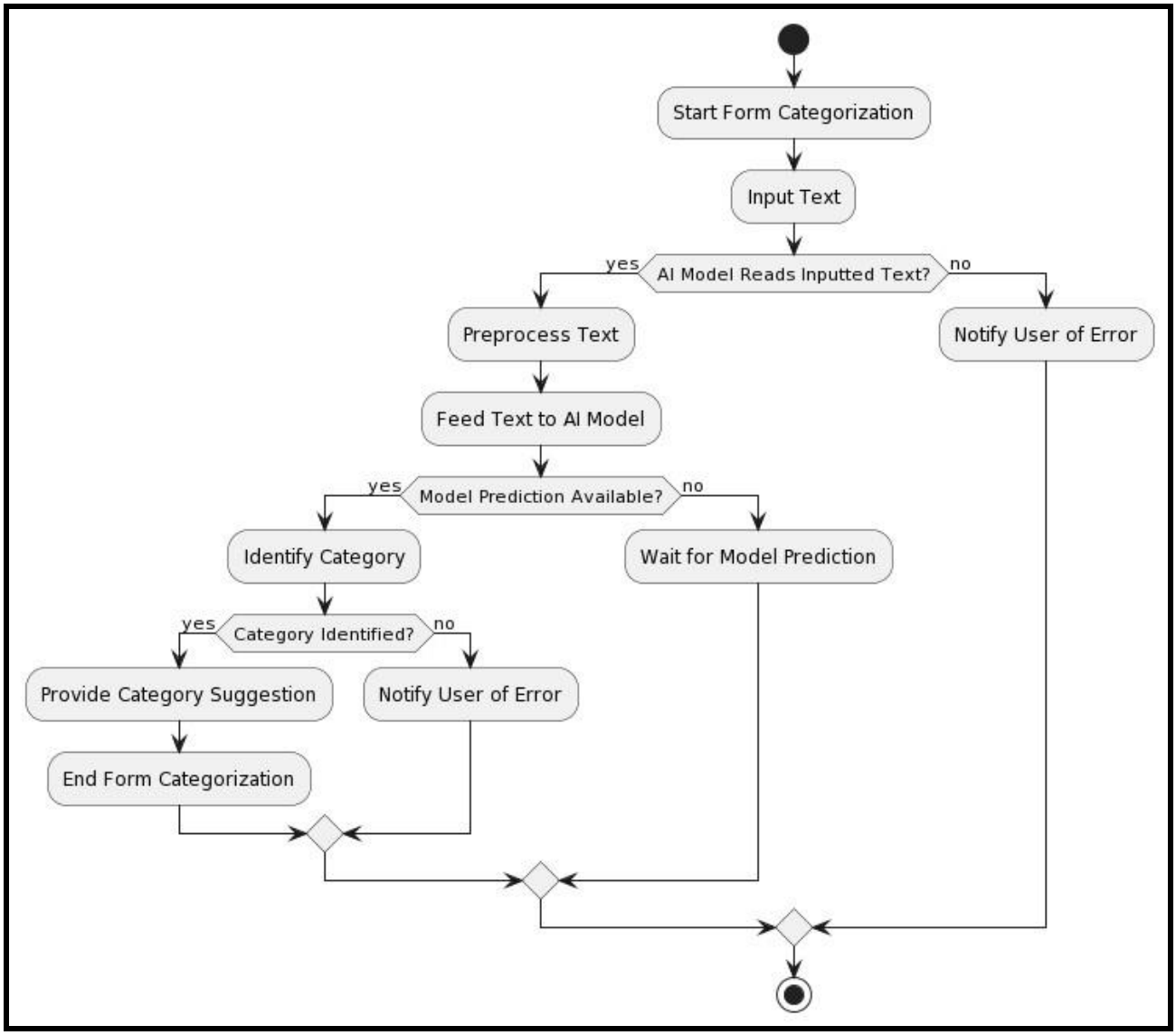
- Authorization Control: Only authorized staff members should have permission to approve degree issuance requests or resolve financial queries.
- Data Confidentiality: Personal information of students (e.g., grades, financial details) should only be accessible to authorized personnel based on their roles.
- Compliance Checks: Ensure that all processes adhere to institutional policies and regulations governing academic and administrative operations.

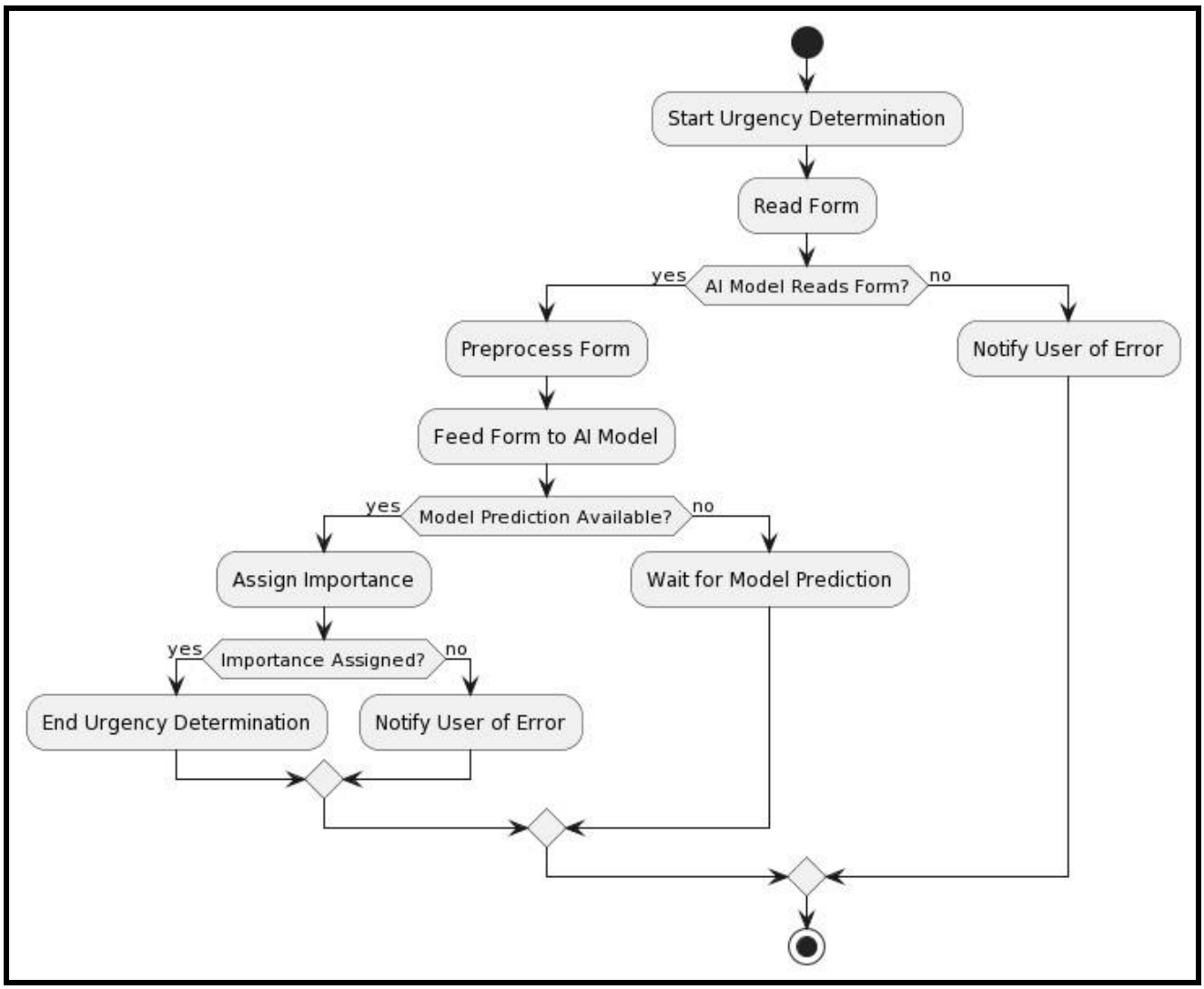
6. Diagrams

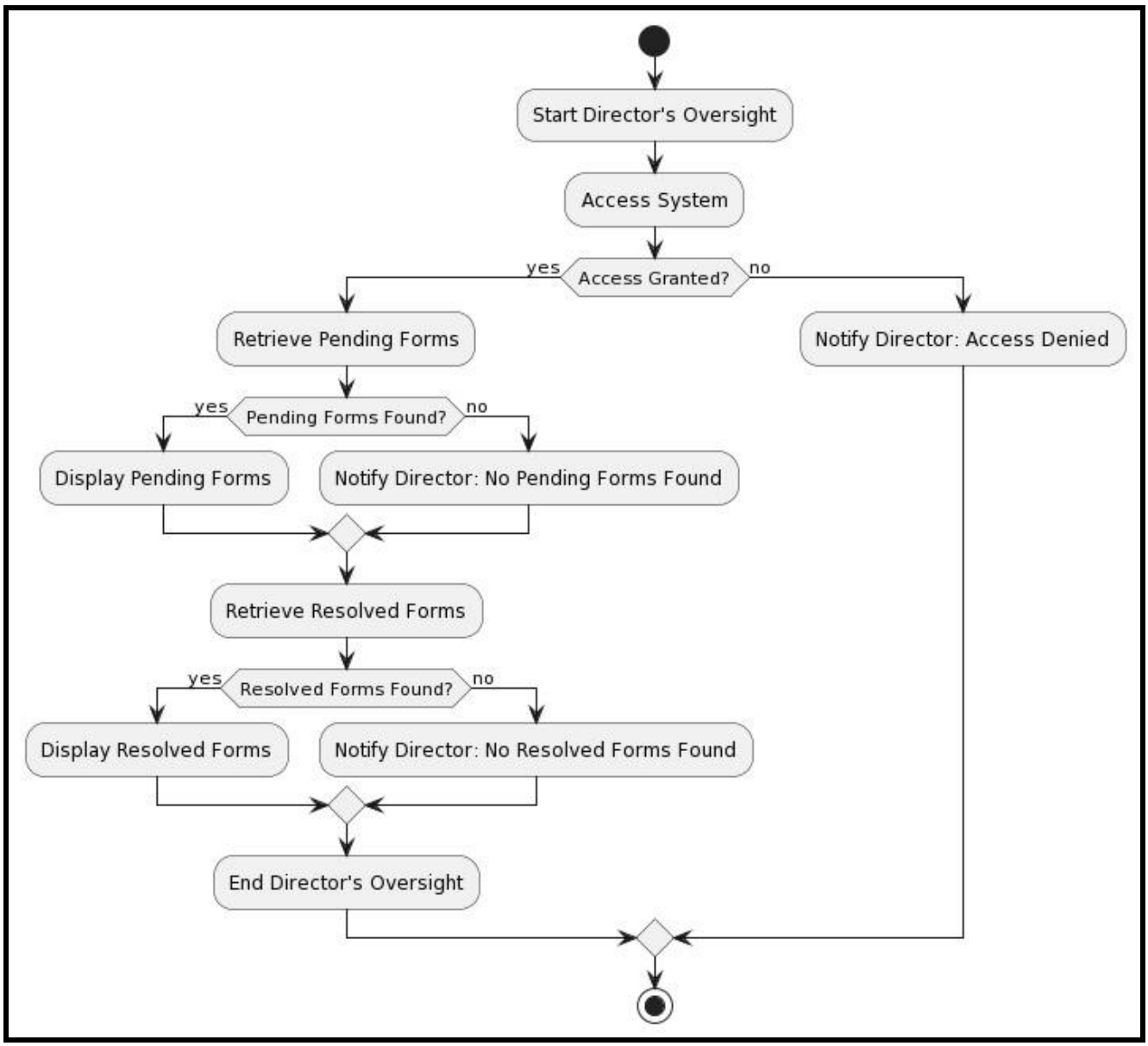
6.1 Use Case Diagram

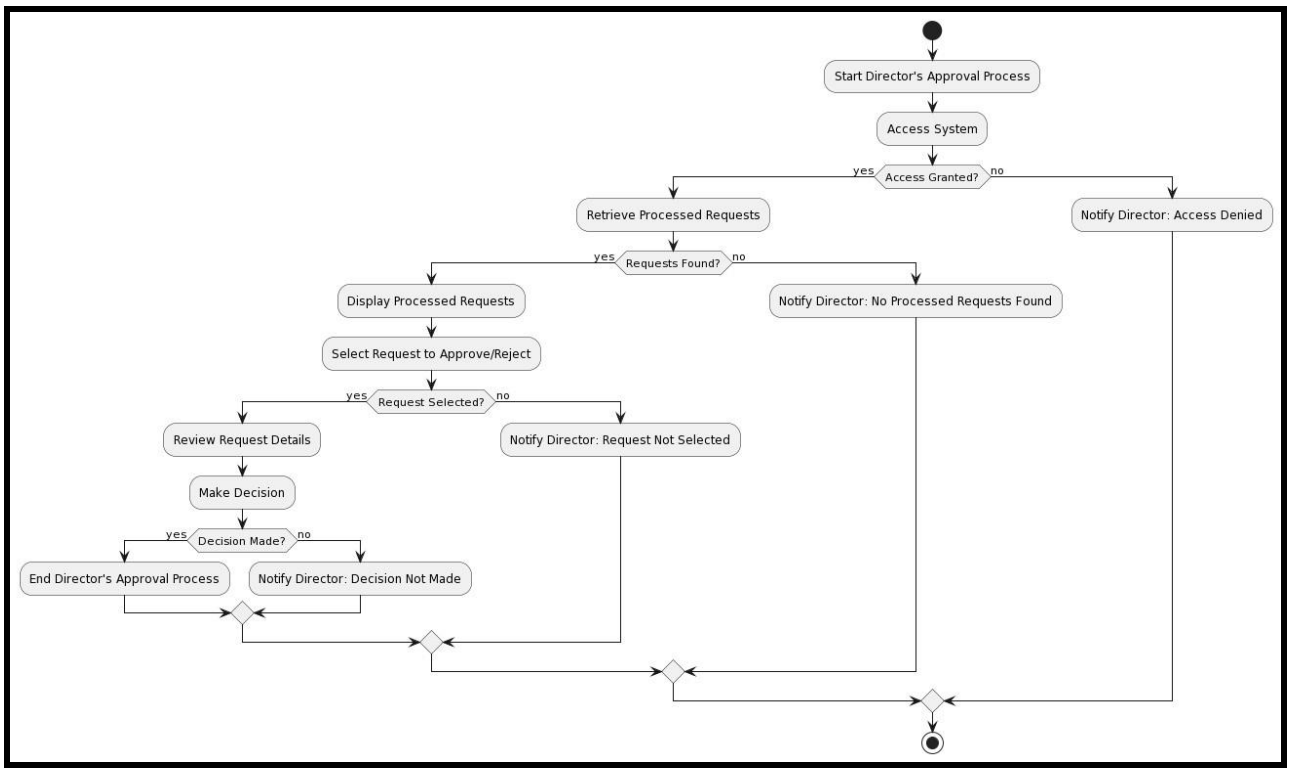

Use Cases
Notification Regarding Receiving Degree
Admit Card
Admit Card Issuance
Event Schedule
Scholarship Programs
Exchange Programs
Student
Tracking the Activity Process
Freeze Request
Submitting the Degree Issuance Form
Student Records
Complaint Form Submission
Director's Oversight
Director's Approval Process
Recording for Forms
Staff Member
Authorization Control
Successful Events Management
Semester Freeze Request
Form Categorization
Urgency Determination
Financial Decisions
One Stop Token Generation for Admin
One Stop Management Request for Admin
Director's Request for Daily Analysis
Administrator
Exchange Programs Offerings
Transcript Issuance for Admin
Transcript
Budget Management
Financial Queries
Payment Management
One Stop System
One Stop Token Generation for Admin
Token Generation
Databases

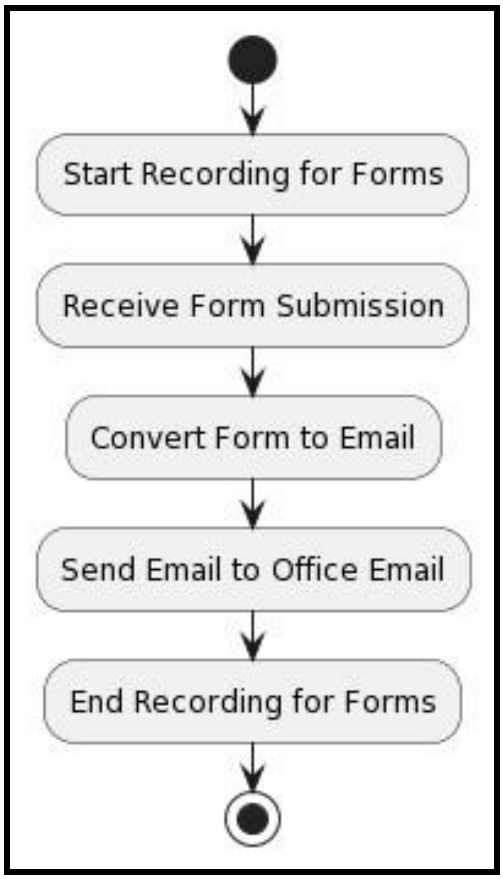
6.2 Activity Diagram

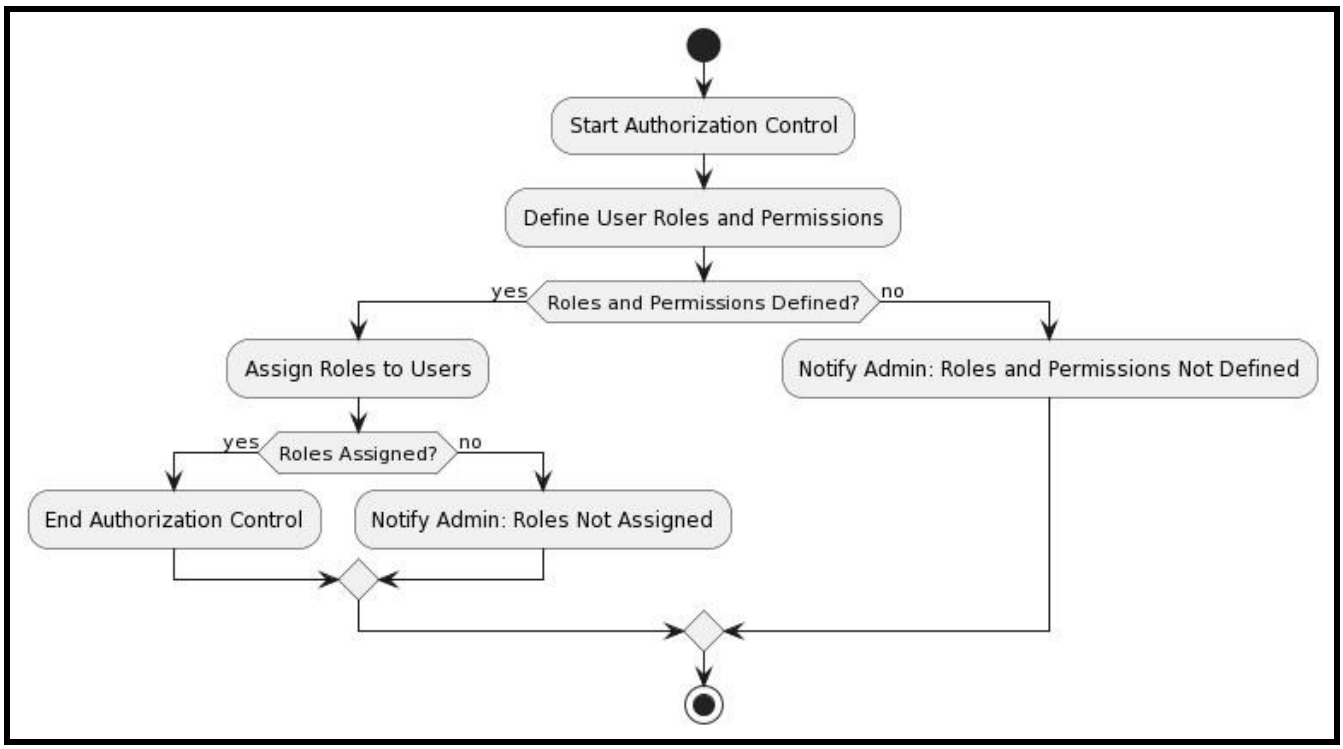


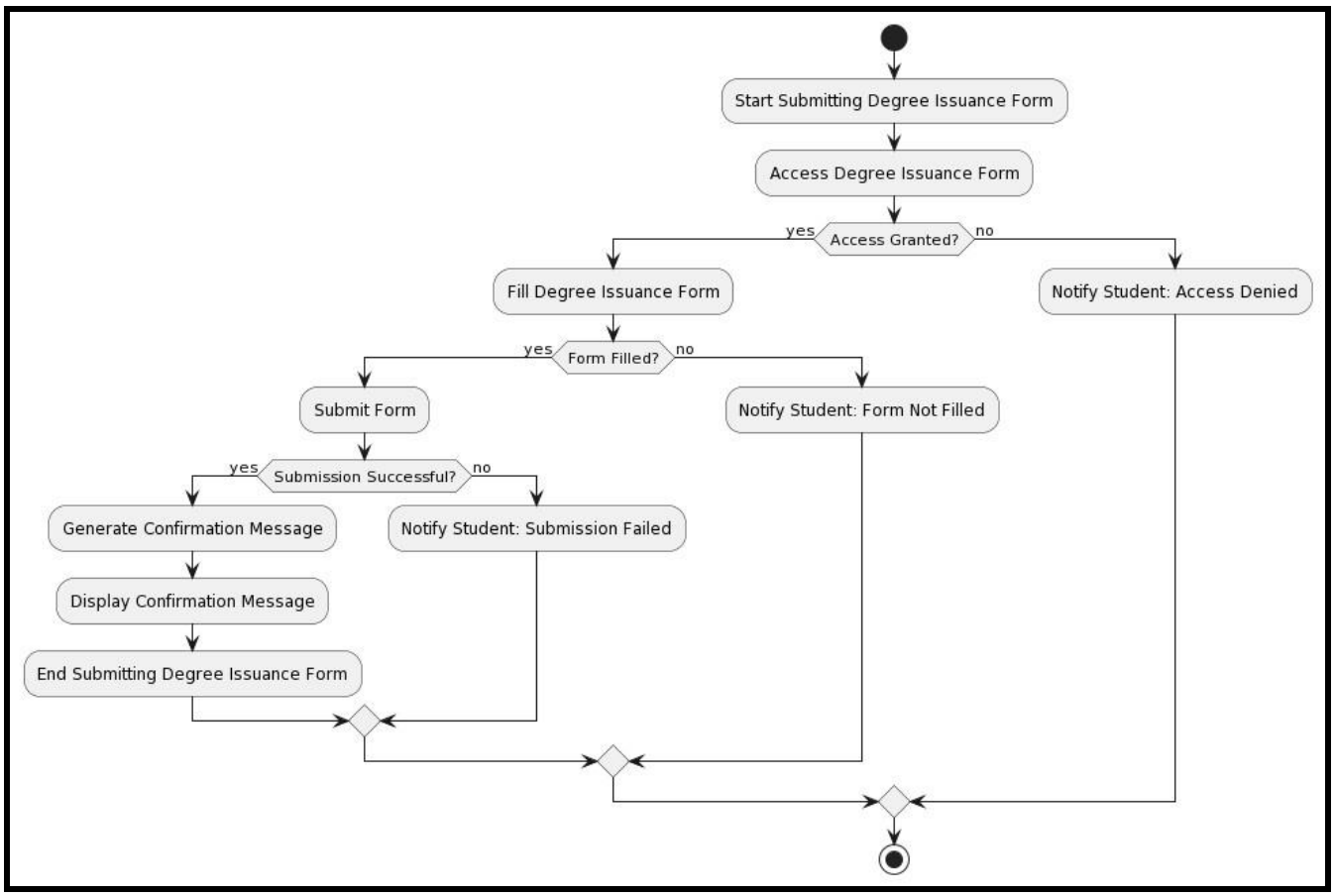

Start Urgency Determination
Read Form
AI Model Reads Form?
yes
no
Preprocess Form
Notify User of Error
Feed Form to AI Model
Model Prediction Available?
yes
no
Assign Importance
Wait for Model Prediction
Importance Assigned?
yes
no
End Urgency Determination
Notify User of Error

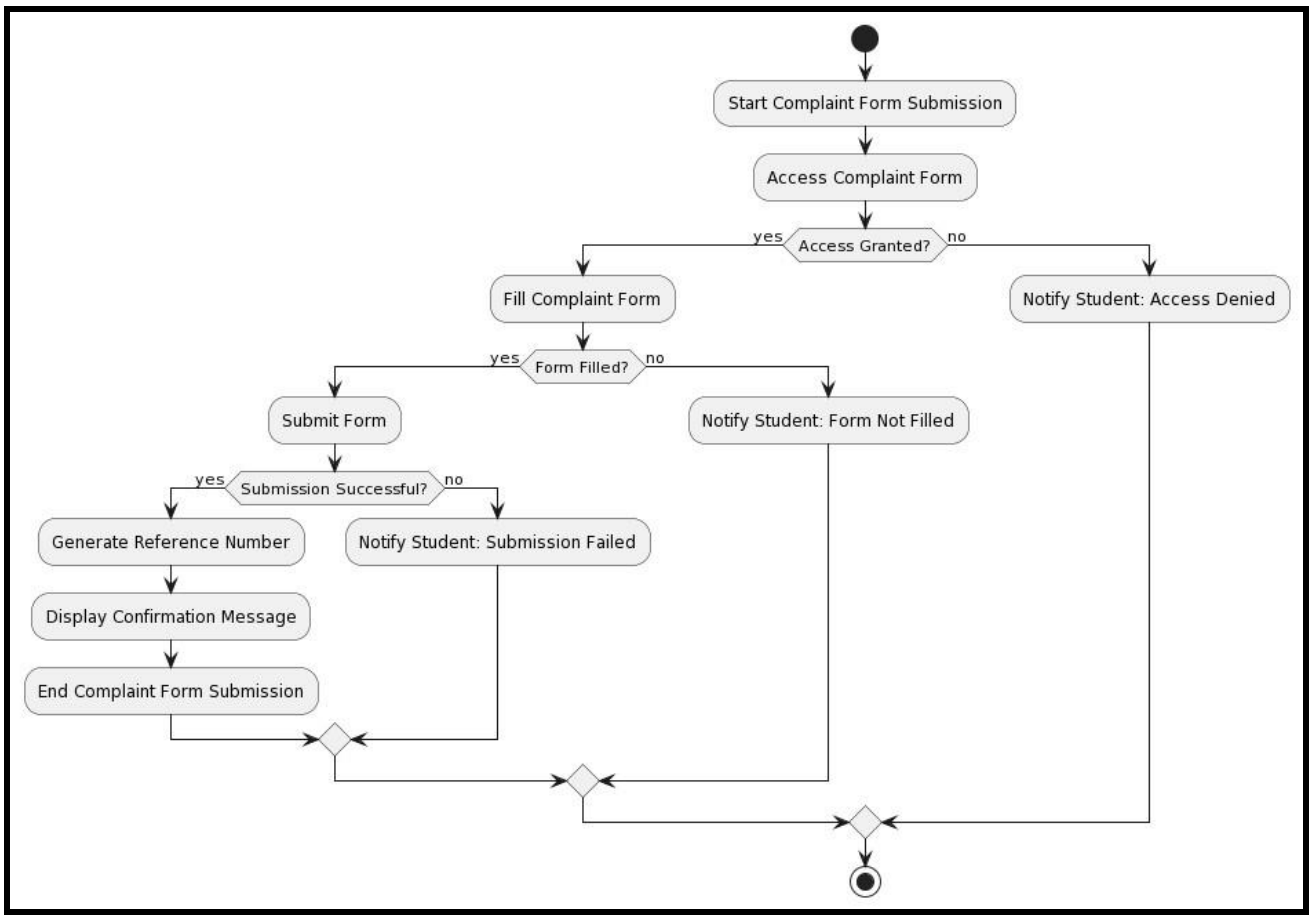

Start Director's Oversight
Access System
yes
Access Granted?
no
Retrieve Pending Forms
Notify Director: Access Denied
yes
Pending Forms Found?
no
Display Pending Forms
Notify Director: No Pending Forms Found
Retrieve Resolved Forms
yes
Resolved Forms Found?
no
Display Resolved Forms
Notify Director: No Resolved Forms Found
End Director's Oversight

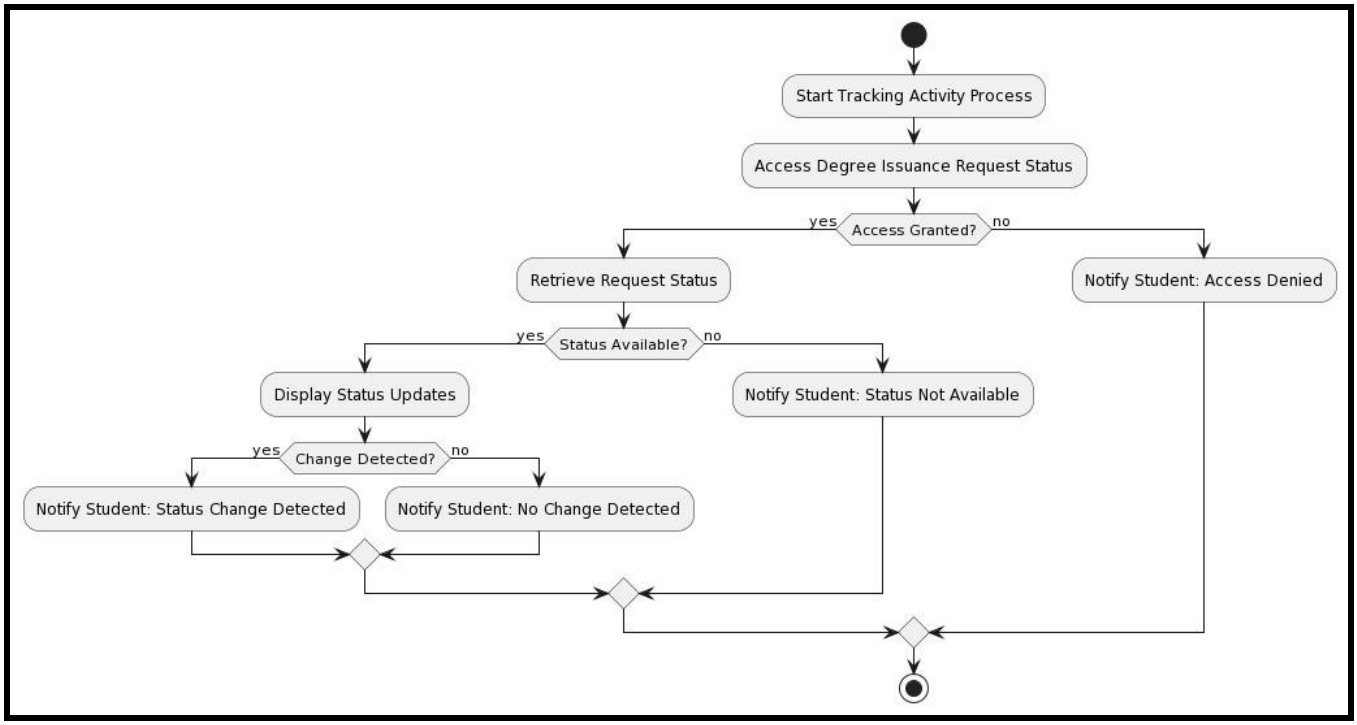

Start Director's Approval Process
Access System
Access Granted?
yes
no
Retrieve Processed Requests
Notify Director: Access Denied
Requests Found?
yes
no
Display Processed Requests
Notify Director: No Processed Requests Found
Select Request to Approve/Reject
Request Selected?
yes
no
Review Request Details
Notify Director: Request Not Selected
Make Decision
Decision Made?
yes
no
End Director's Approval Process
Notify Director: Decision Not Made

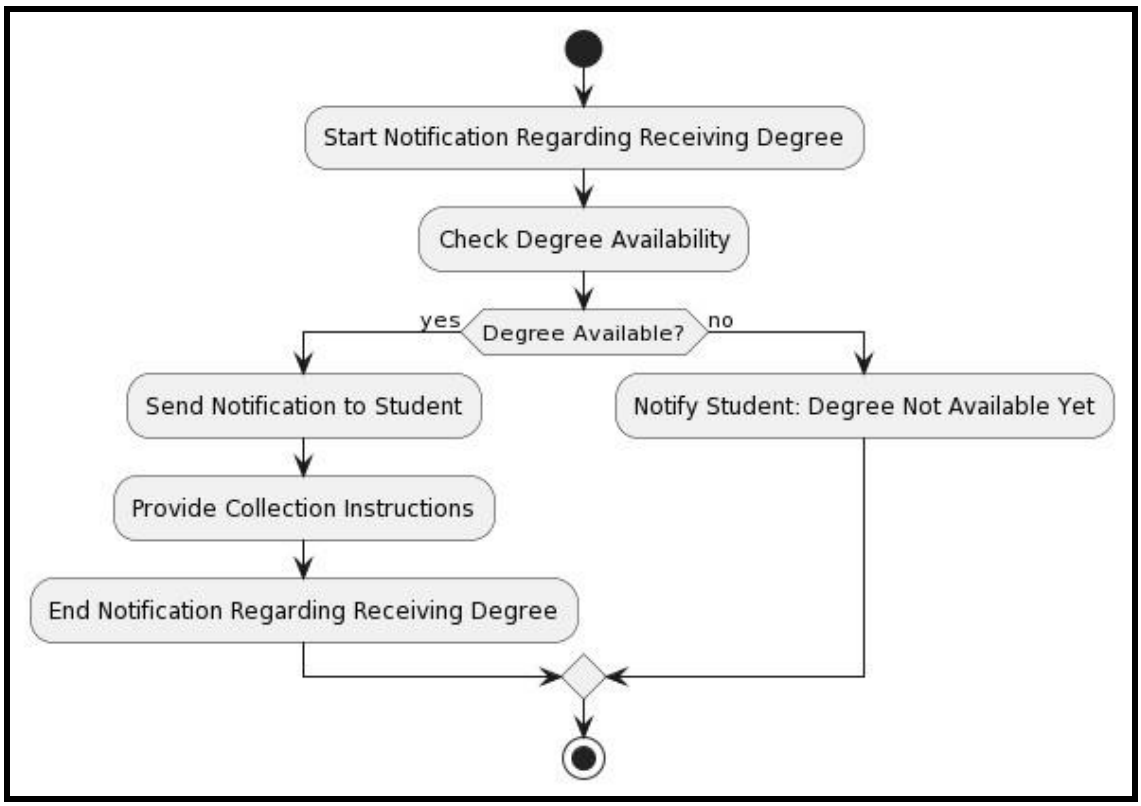

Start Recording for Forms
Receive Form Submission
Convert Form to Email
Send Email to Office Email
End Recording for Forms

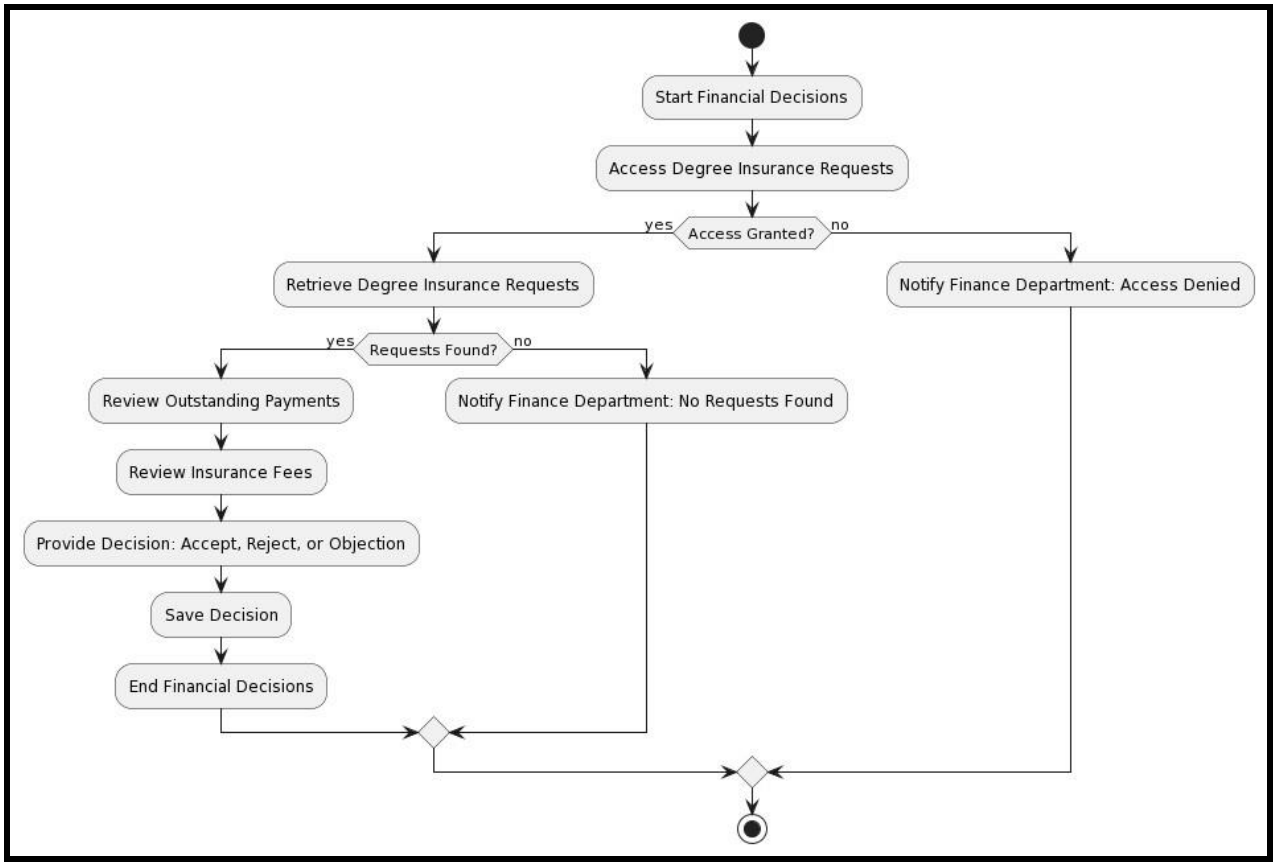

Start Authorization Control
Define User Roles and Permissions
yes
Roles and Permissions Defined?
no
Assign Roles to Users
Notify Admin: Roles and Permissions Not Defined
yes
Roles Assigned?
no
End Authorization Control
Notify Admin: Roles Not Assigned

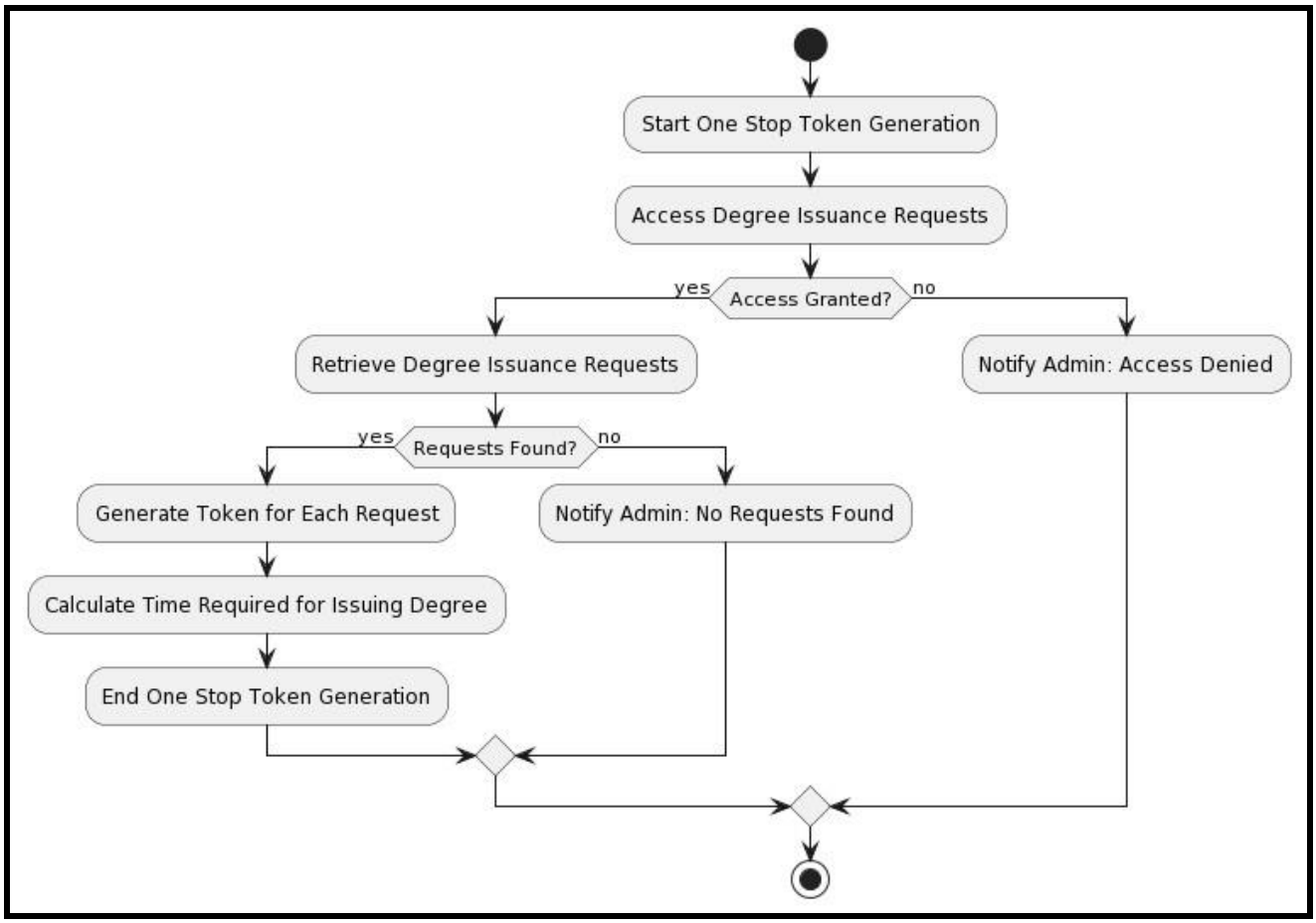

Start Submitting Degree Issuance Form
Access Degree Issuance Form
yes
Access Granted?
no
Fill Degree Issuance Form
Notify Student: Access Denied
yes
Form Filled?
no
Submit Form
Notify Student: Form Not Filled
yes
Submission Successful?
no
Generate Confirmation Message
Notify Student: Submission Failed
Display Confirmation Message
End Submitting Degree Issuance Form

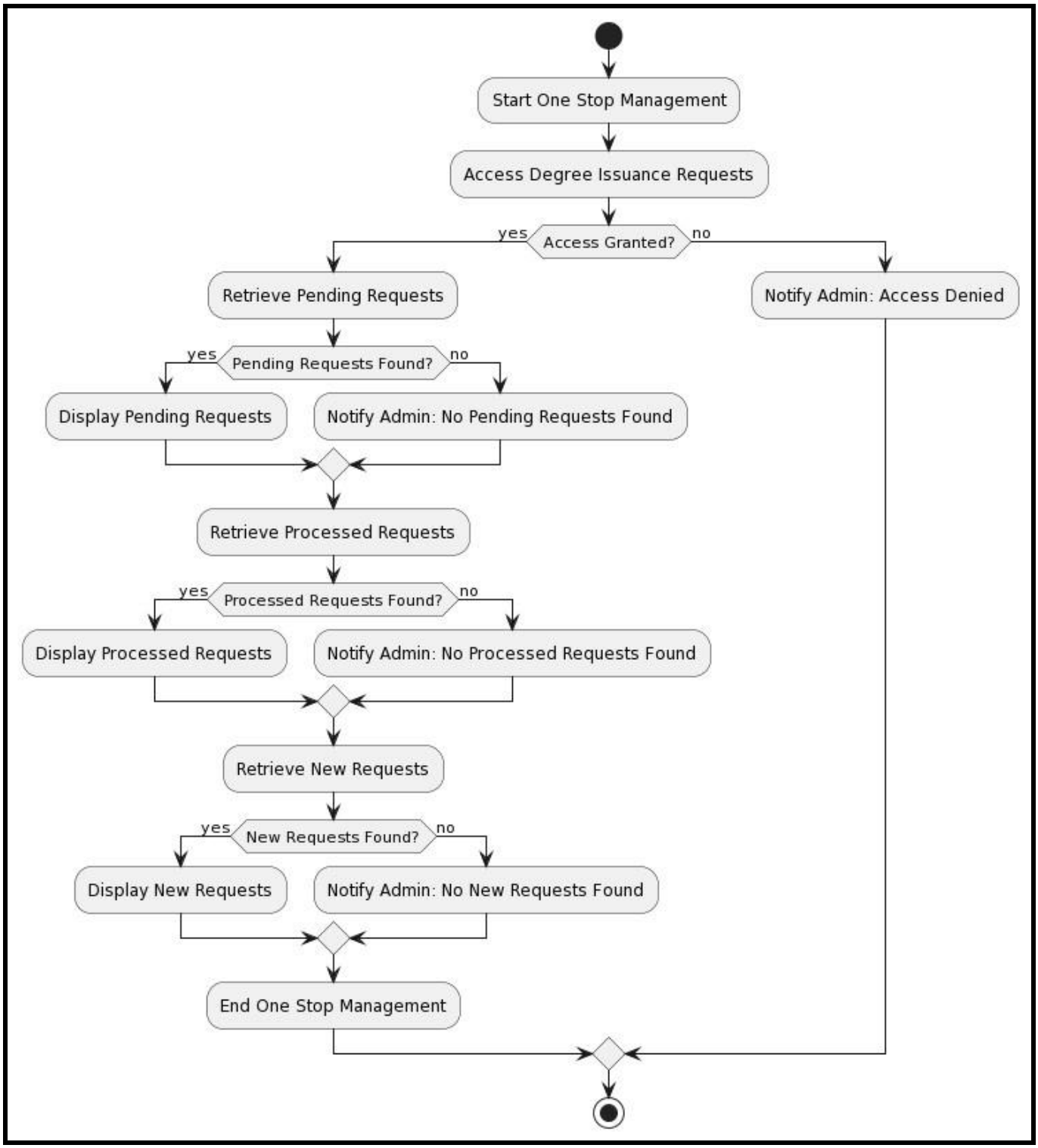

Start Complaint Form Submission
Access Complaint Form
Access Granted?
yes
no
Fill Complaint Form
Notify Student: Access Denied
Form Filled?
yes
no
Submit Form
Notify Student: Form Not Filled
Submission Successful?
yes
no
Generate Reference Number
Notify Student: Submission Failed
Display Confirmation Message
End Complaint Form Submission

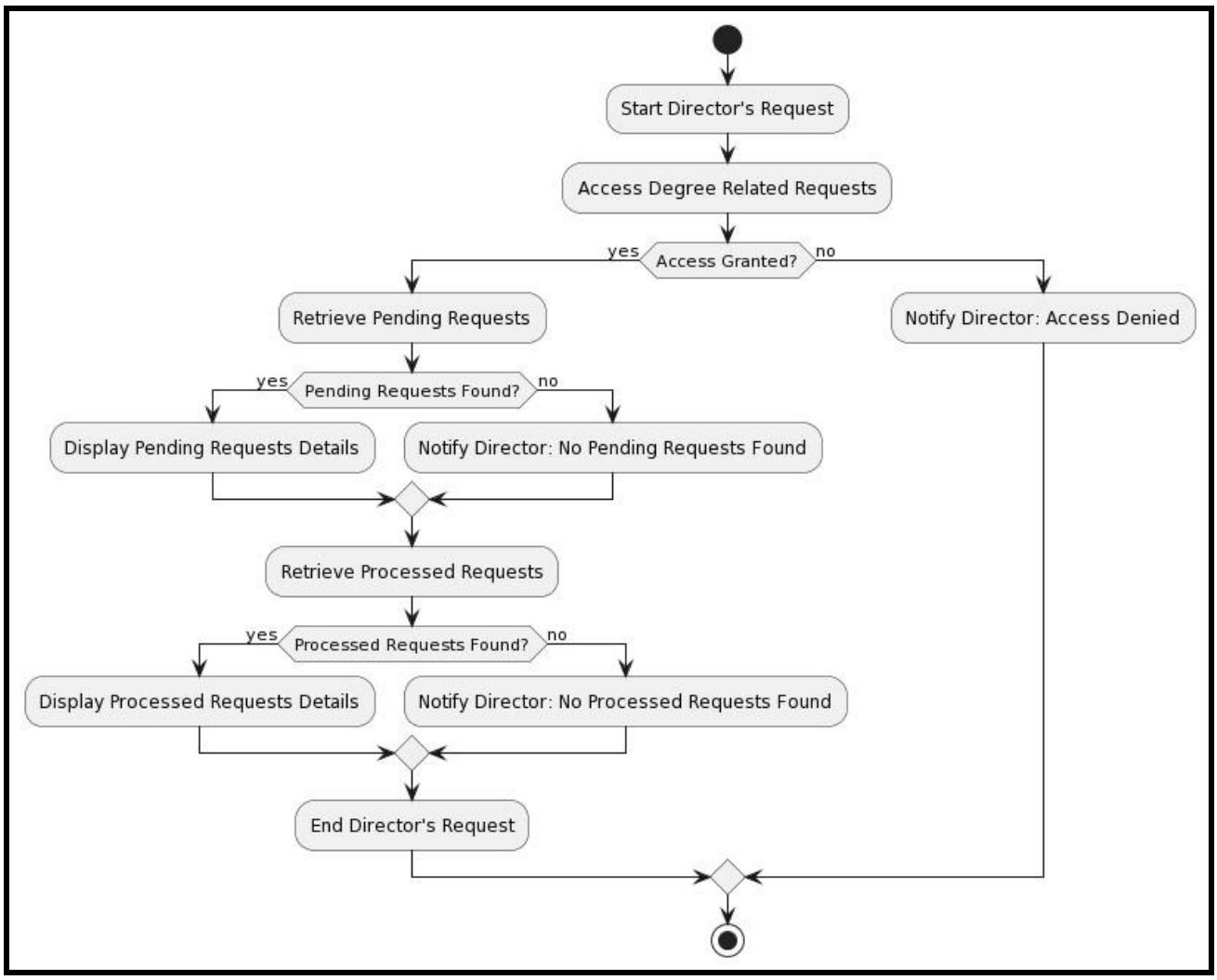

Start Tracking Activity Process
Access Degree Issuance Request Status
Access Granted?
yes
no
Retrieve Request Status
Notify Student: Access Denied
Status Available?
yes
no
Display Status Updates
Notify Student: Status Not Available
Change Detected?
yes
no
Notify Student: Status Change Detected
Notify Student: No Change Detected

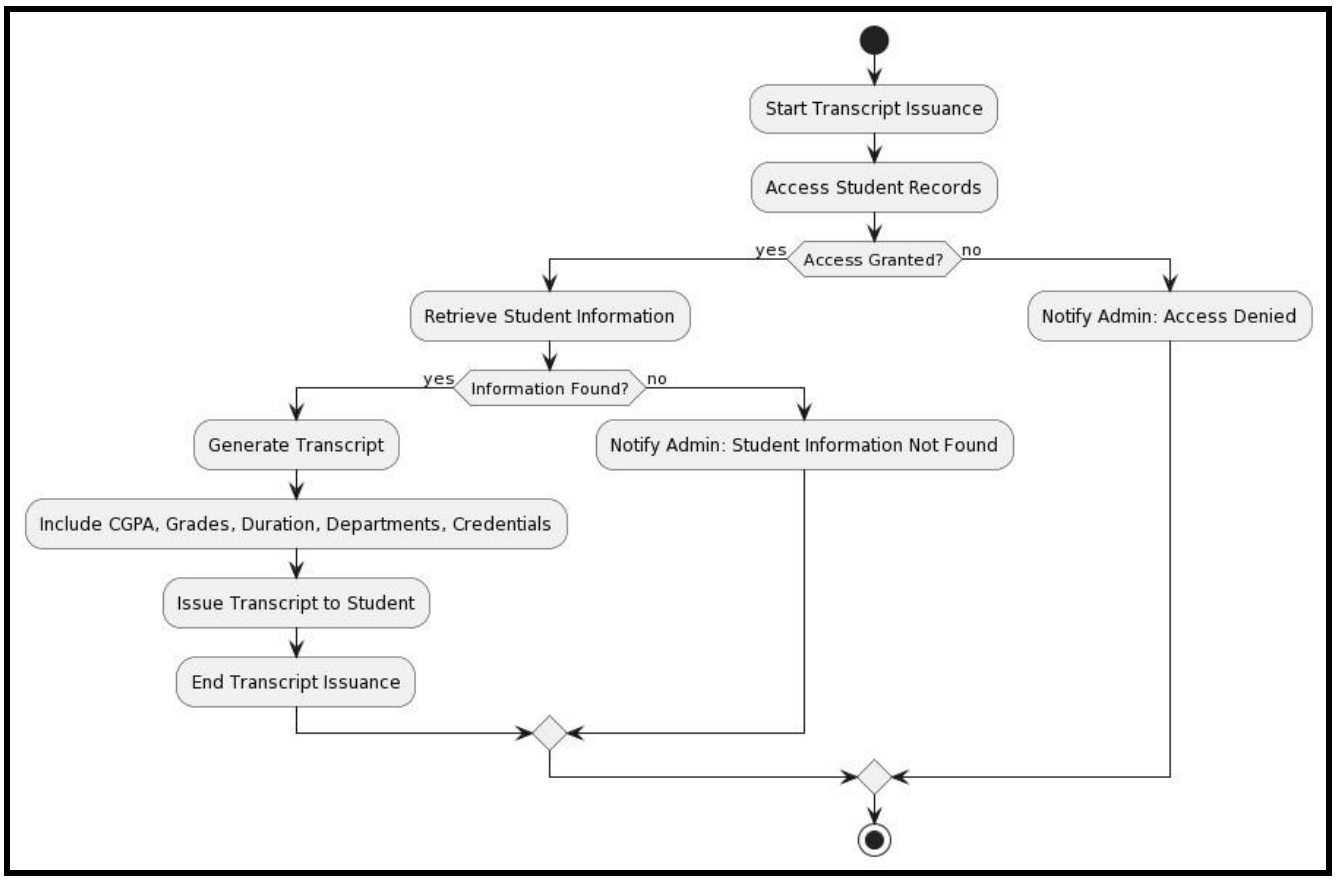

Start Notification Regarding Receiving Degree
Check Degree Availability
yes
Degree Available?
no
Send Notification to Student
Notify Student: Degree Not Available Yet
Provide Collection Instructions
End Notification Regarding Receiving Degree

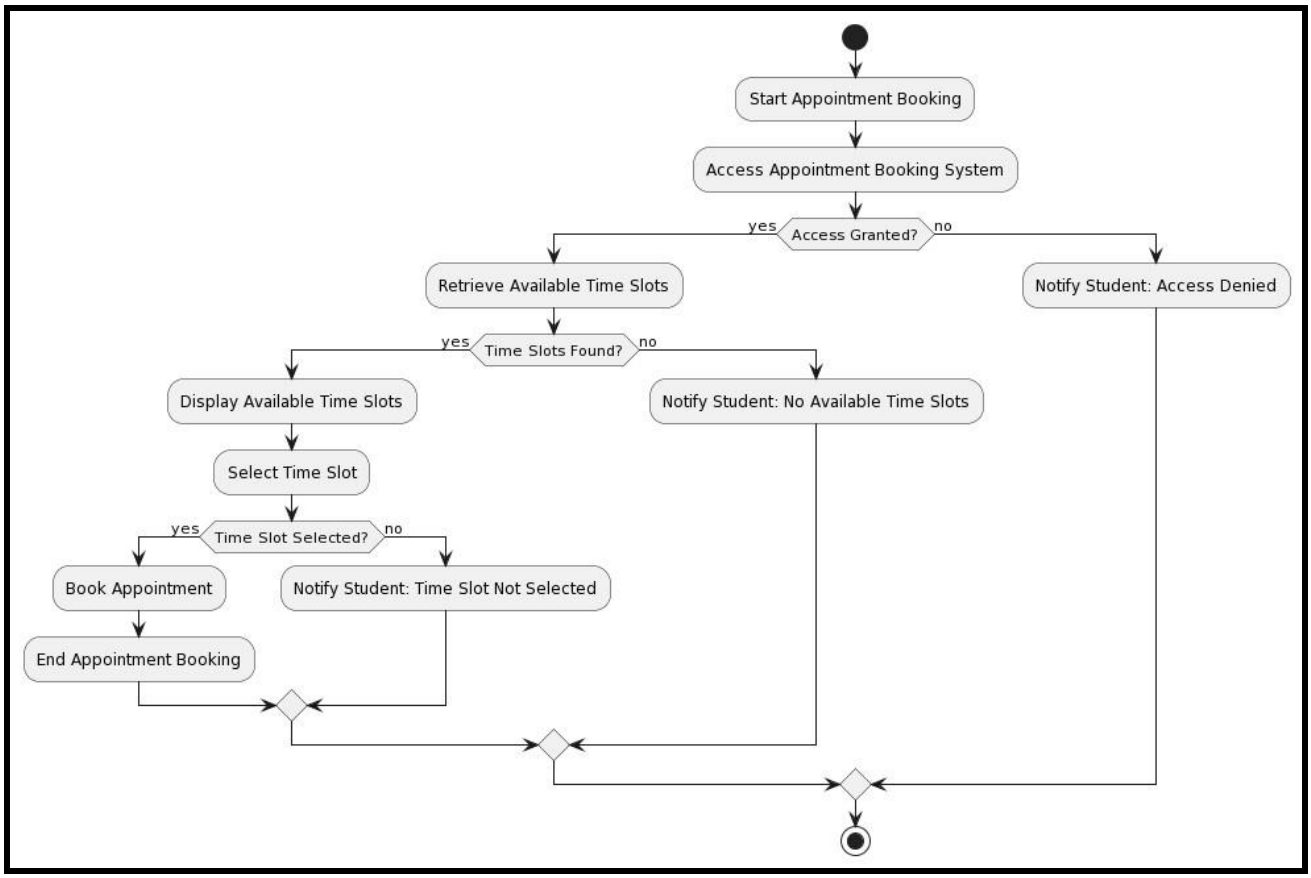

Start Financial Decisions
Access Degree Insurance Requests
yes
Access Granted?
no
Retrieve Degree Insurance Requests
Notify Finance Department: Access Denied
yes
Requests Found?
no
Review Outstanding Payments
Notify Finance Department: No Requests Found
Review Insurance Fees
Provide Decision: Accept, Reject, or Objection
Save Decision
End Financial Decisions

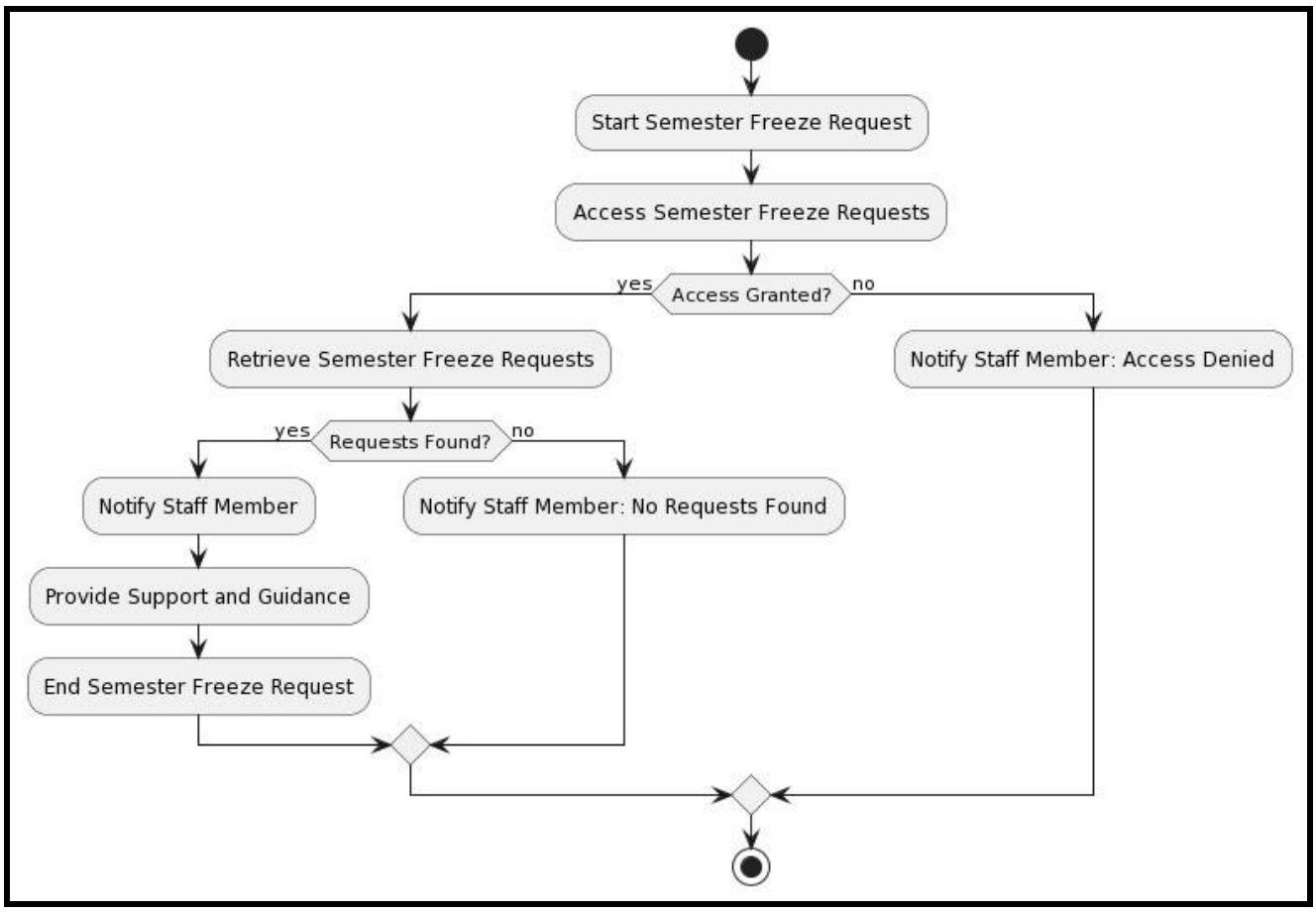

Start One Stop Token Generation
Access Degree Issuance Requests
yes
Access Granted?
no
Retrieve Degree Issuance Requests
Notify Admin: Access Denied
yes
Requests Found?
no
Generate Token for Each Request
Notify Admin: No Requests Found
Calculate Time Required for Issuing Degree
End One Stop Token Generation

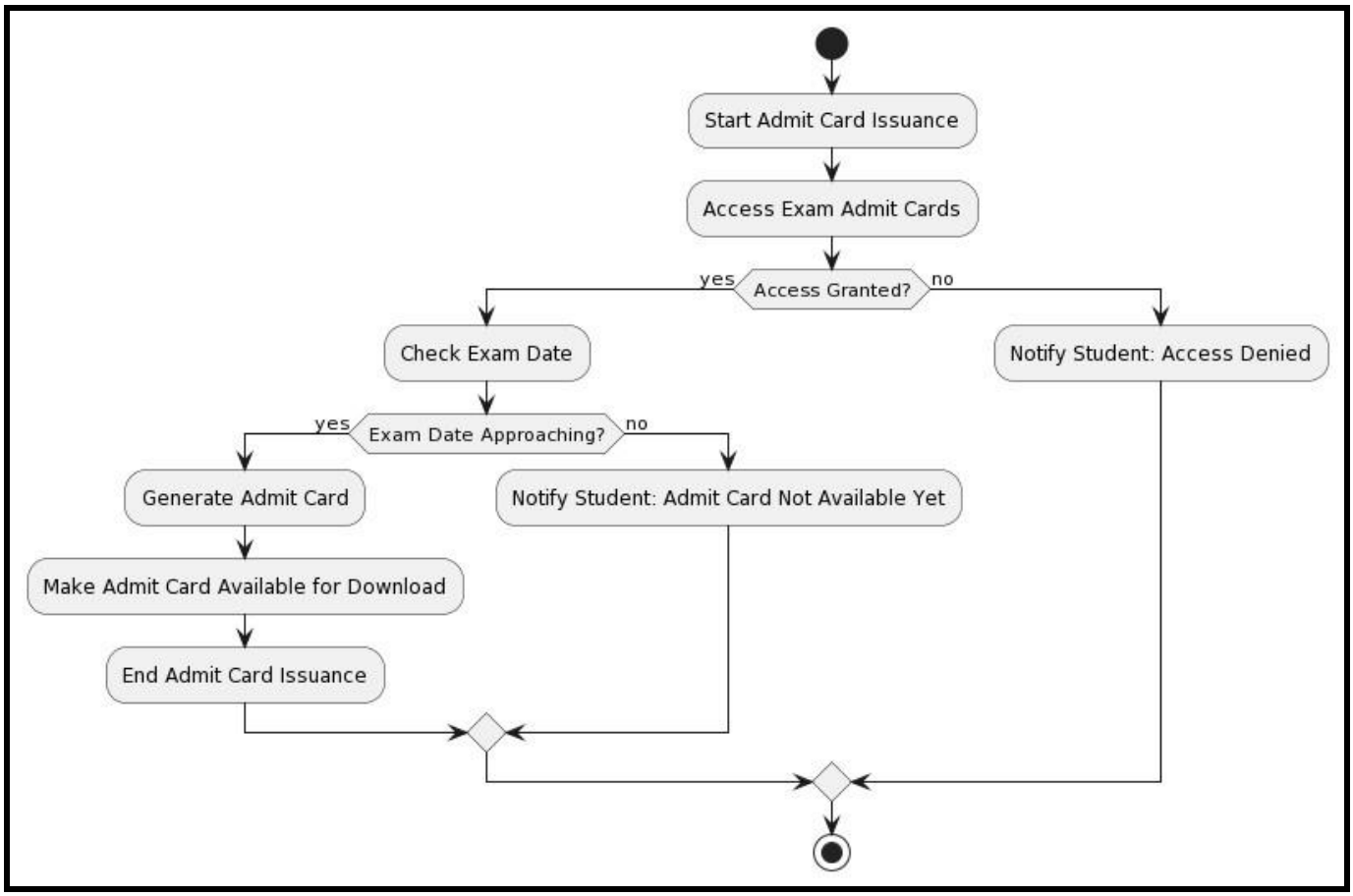

Start One Stop Management
Access Degree Issuance Requests
yes
Access Granted?
no
Retrieve Pending Requests
Notify Admin: Access Denied
yes
Pending Requests Found?
no
Display Pending Requests
Notify Admin: No Pending Requests Found
Retrieve Processed Requests
yes
Processed Requests Found?
no
Display Processed Requests
Notify Admin: No Processed Requests Found
Retrieve New Requests
yes
New Requests Found?
no
Display New Requests
Notify Admin: No New Requests Found
End One Stop Management

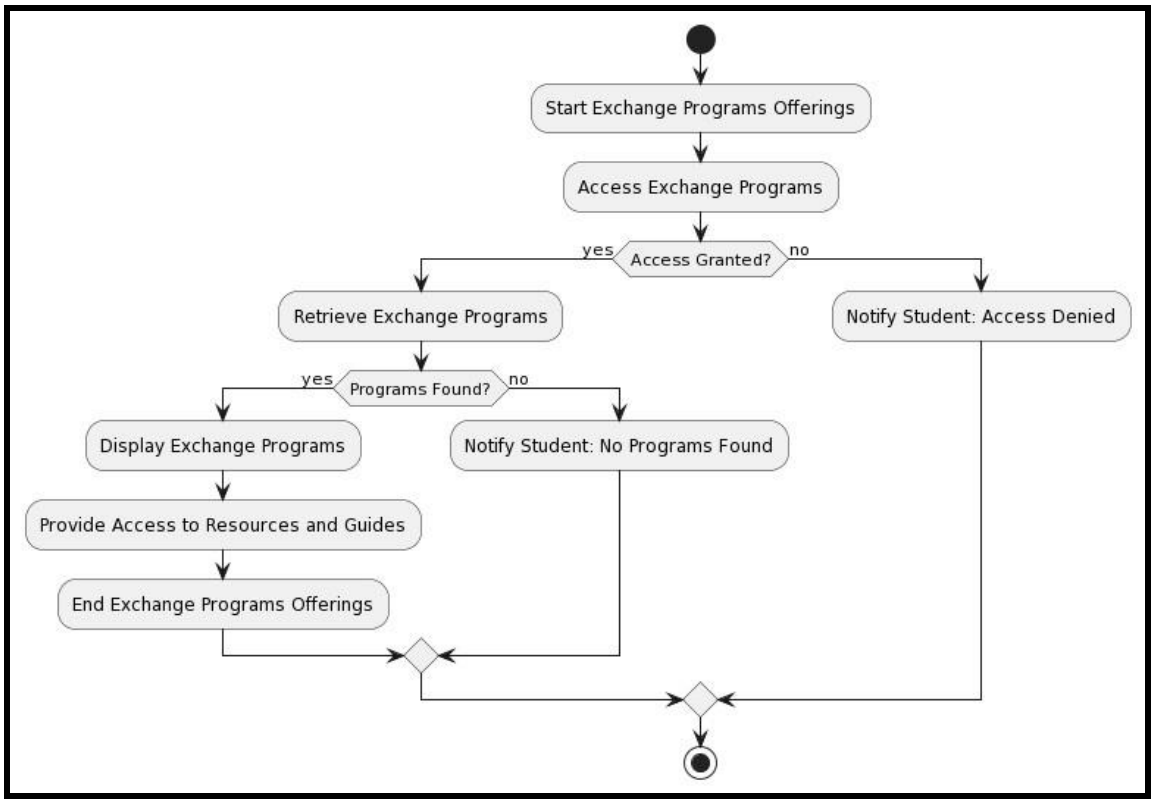

Start Director's Request
Access Degree Related Requests
yes
Access Granted?
no
Retrieve Pending Requests
Notify Director: Access Denied
yes
Pending Requests Found?
no
Display Pending Requests Details
Notify Director: No Pending Requests Found
Retrieve Processed Requests
yes
Processed Requests Found?
no
Display Processed Requests Details
Notify Director: No Processed Requests Found
End Director's Request

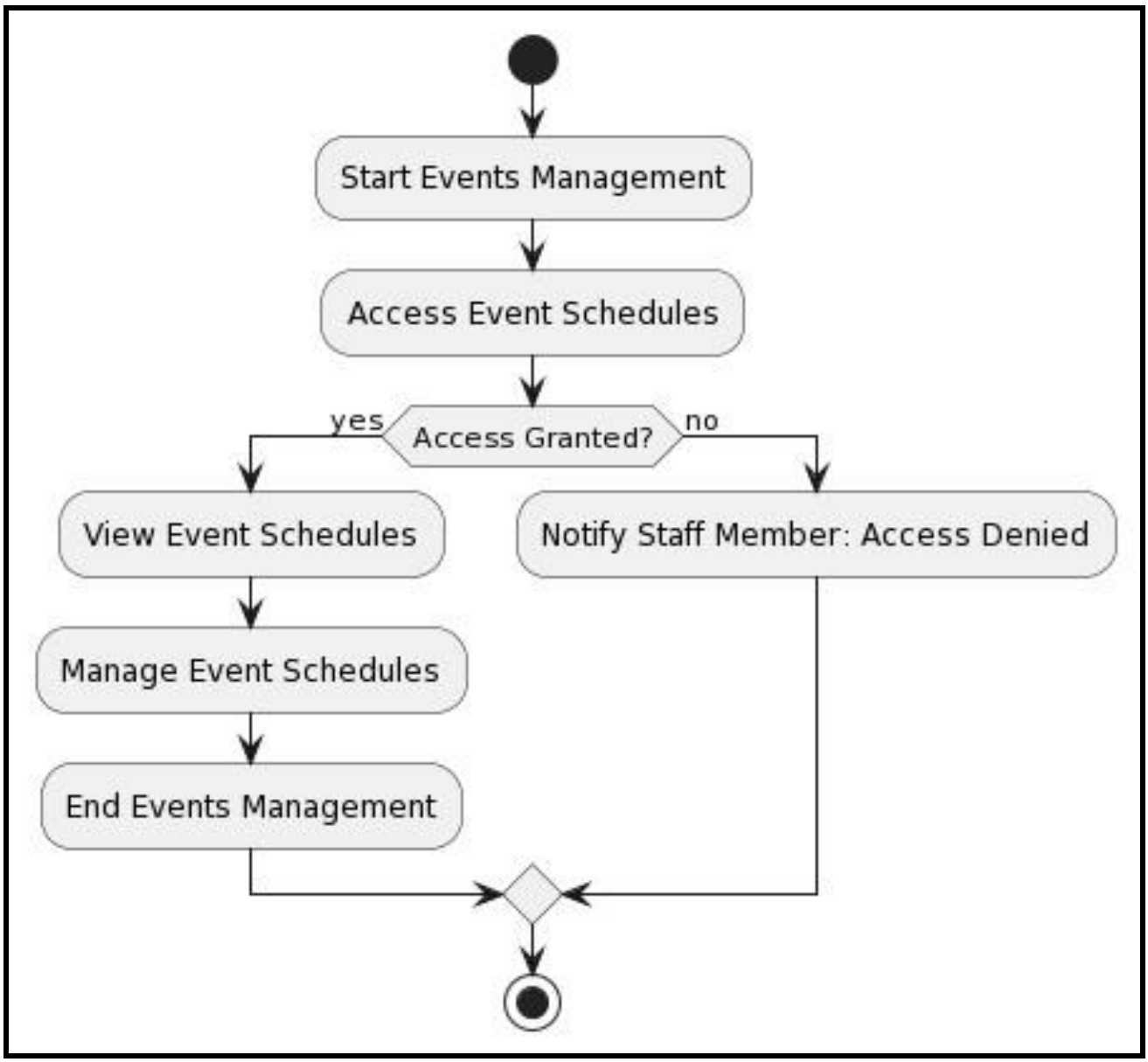

Start Transcript Issuance
Access Student Records
yes
Access Granted?
no
Retrieve Student Information
Notify Admin: Access Denied
yes
Information Found?
no
Generate Transcript
Notify Admin: Student Information Not Found
Include CGPA, Grades, Duration, Departments, Credentials
Issue Transcript to Student
End Transcript Issuance

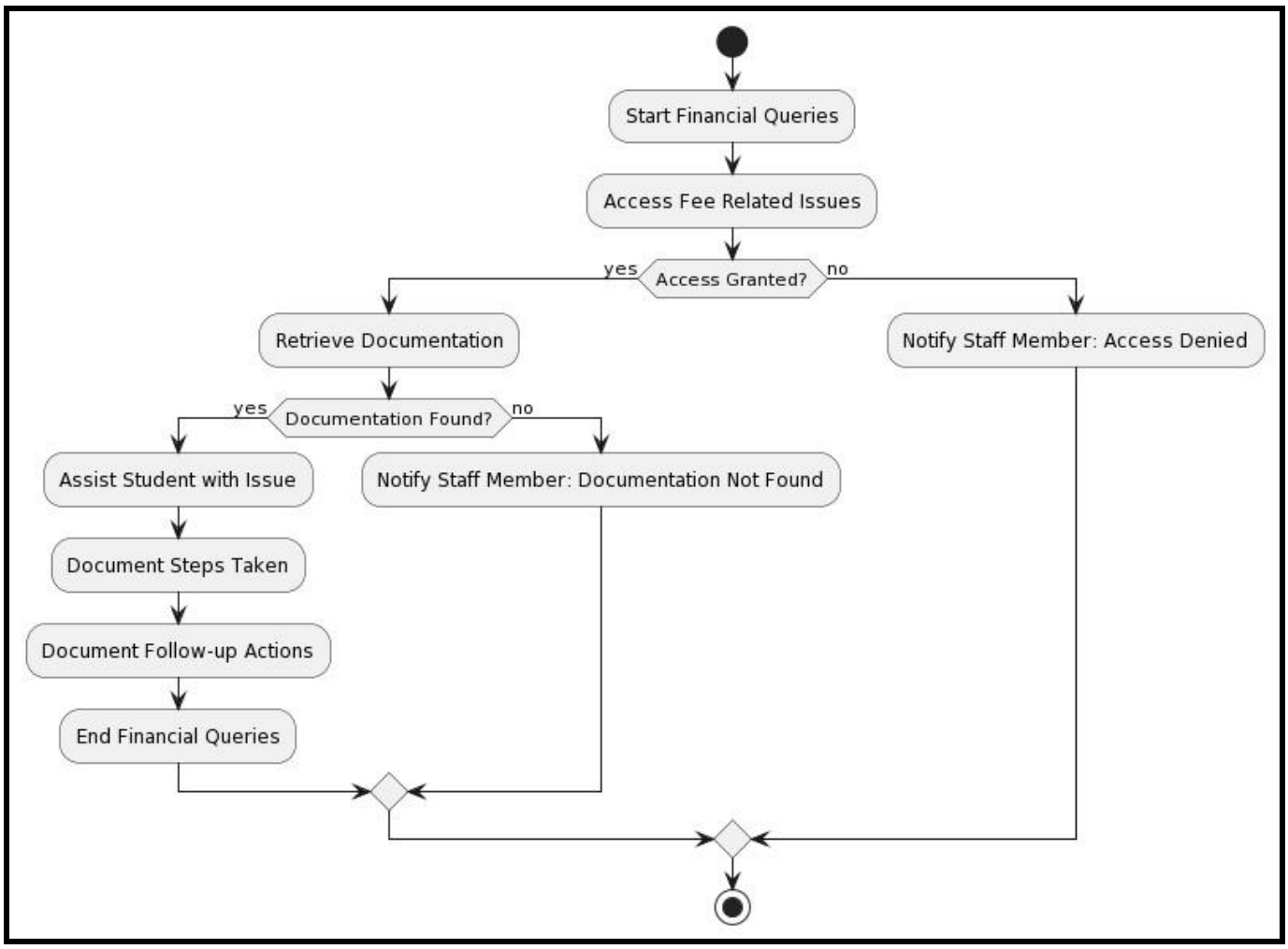

Start Appointment Booking
Access Appointment Booking System
yes
Access Granted?
no
Retrieve Available Time Slots
Notify Student: Access Denied
yes
Time Slots Found?
no
Display Available Time Slots
Notify Student: No Available Time Slots
Select Time Slot
yes
Time Slot Selected?
no
Book Appointment
Notify Student: Time Slot Not Selected
End Appointment Booking

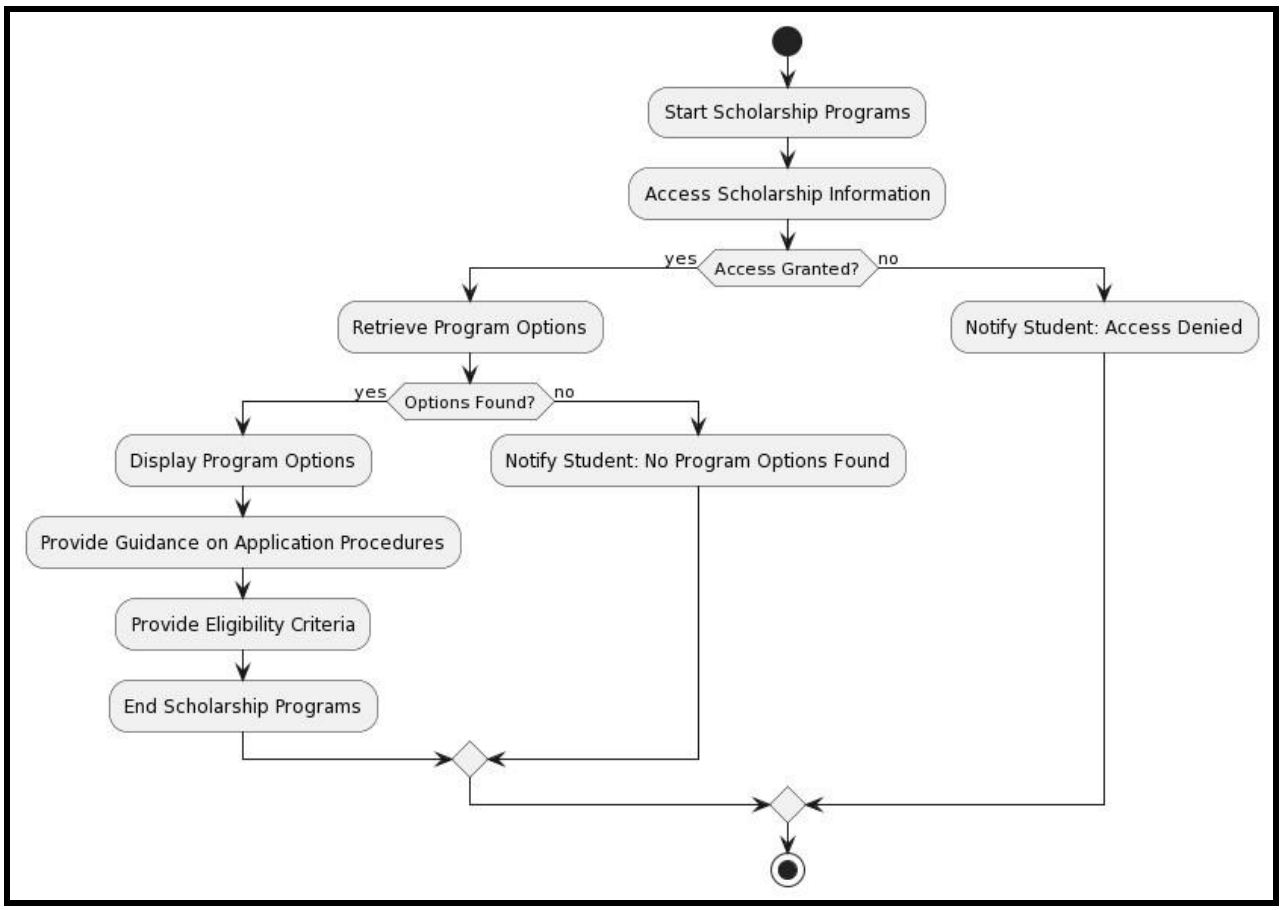

Start Semester Freeze Request
Access Semester Freeze Requests
yes
Access Granted?
no
Retrieve Semester Freeze Requests
Notify Staff Member: Access Denied
yes
Requests Found?
no
Notify Staff Member
Notify Staff Member: No Requests Found
Provide Support and Guidance
End Semester Freeze Request

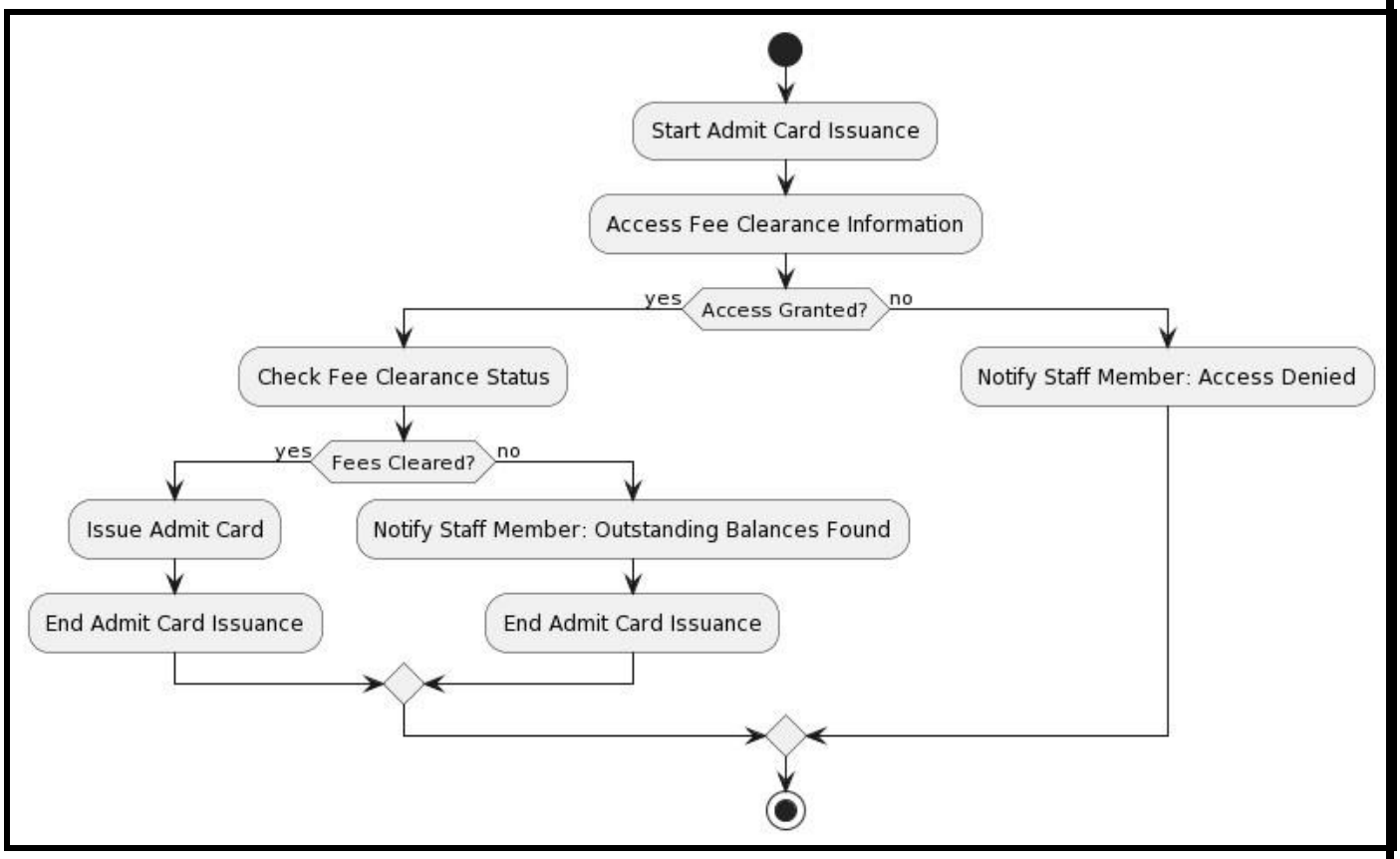

Start Admit Card Issuance
Access Exam Admit Cards
Access Granted?
yes
no
Check Exam Date
Notify Student: Access Denied
Exam Date Approaching?
yes
no
Generate Admit Card
Notify Student: Admit Card Not Available Yet
Make Admit Card Available for Download
End Admit Card Issuance

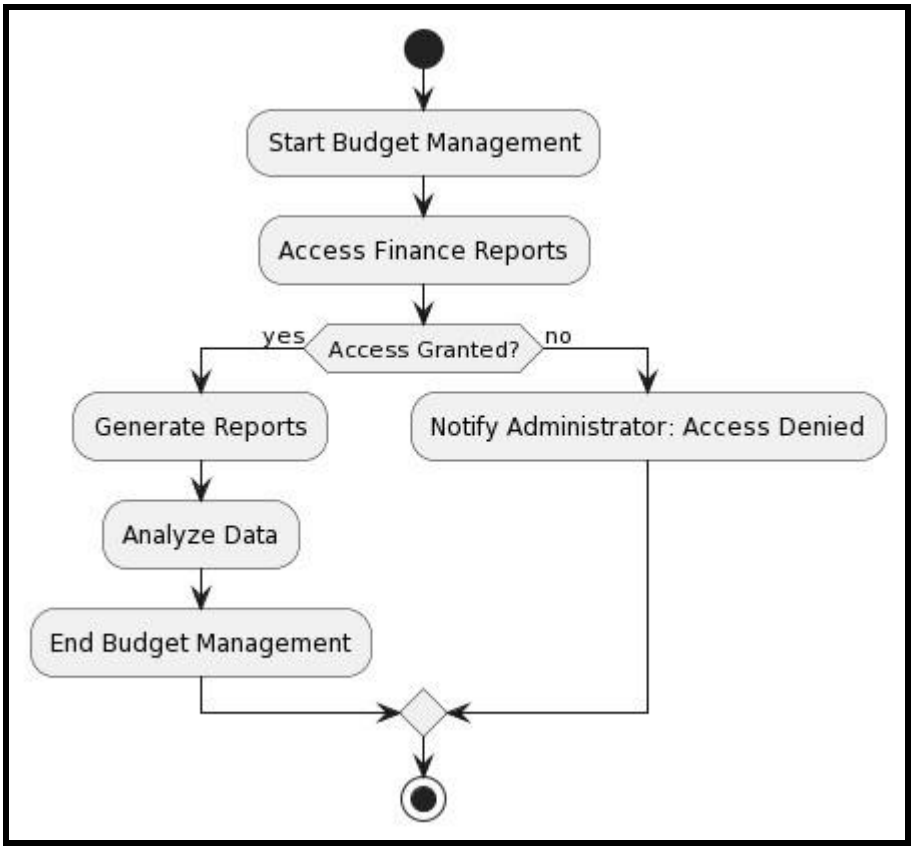

Start Exchange Programs Offerings
Access Exchange Programs
Access Granted?
yes
no
Retrieve Exchange Programs
Notify Student: Access Denied
Programs Found?
yes
no
Display Exchange Programs
Notify Student: No Programs Found
Provide Access to Resources and Guides
End Exchange Programs Offerings

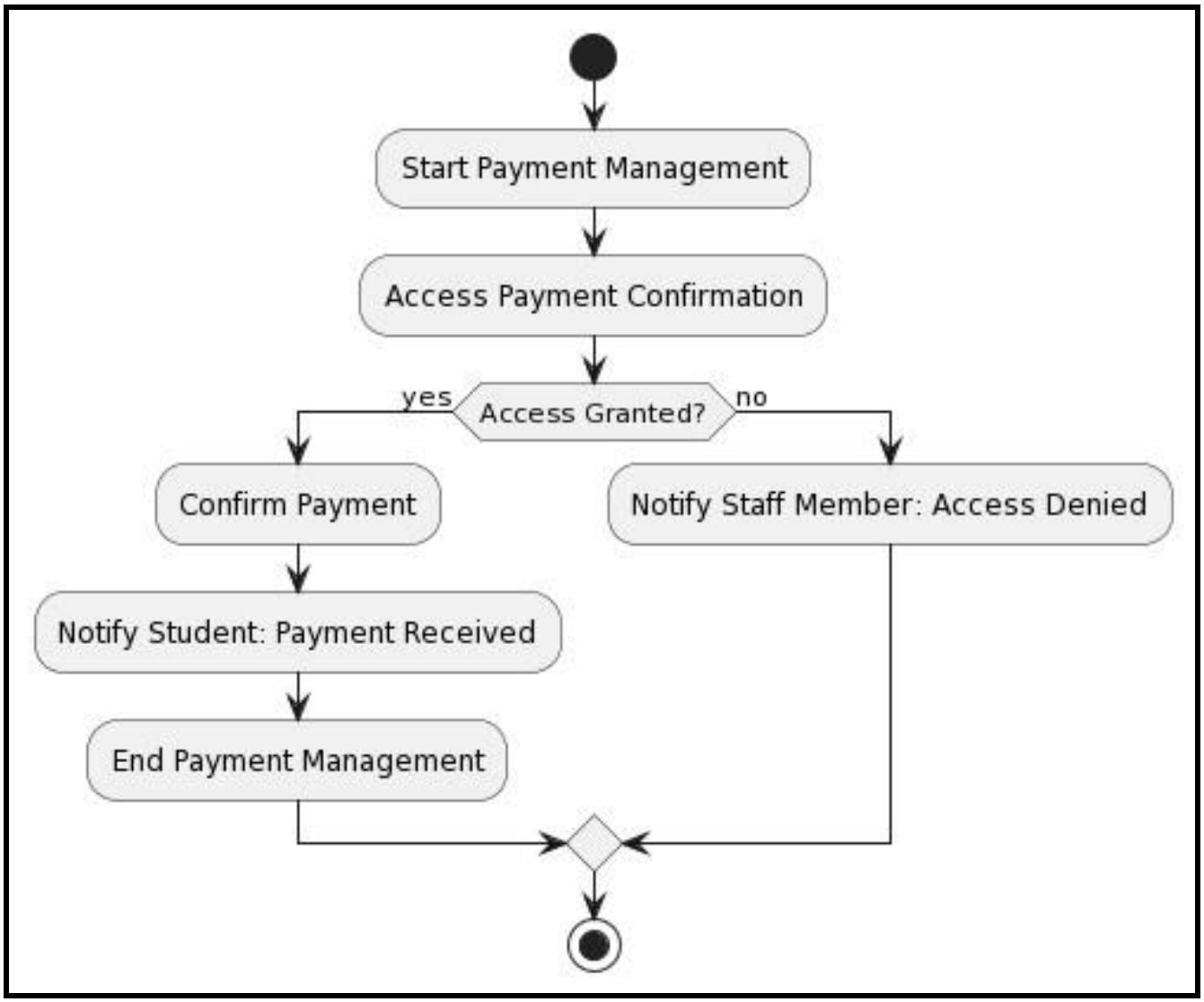

Start Events Management
Access Event Schedules
yes
Access Granted?
no
View Event Schedules
Notify Staff Member: Access Denied
Manage Event Schedules
End Events Management


Start Financial Queries
Access Fee Related Issues
yes
Access Granted?
no
Retrieve Documentation
Notify Staff Member: Access Denied
yes
Documentation Found?
no
Assist Student with Issue
Notify Staff Member: Documentation Not Found
Document Steps Taken
Document Follow-up Actions
End Financial Queries


Start Scholarship Programs
Access Scholarship Information
yes
Access Granted?
no
Retrieve Program Options
Notify Student: Access Denied
yes
Options Found?
no
Display Program Options
Notify Student: No Program Options Found
Provide Guidance on Application Procedures
Provide Eligibility Criteria
End Scholarship Programs

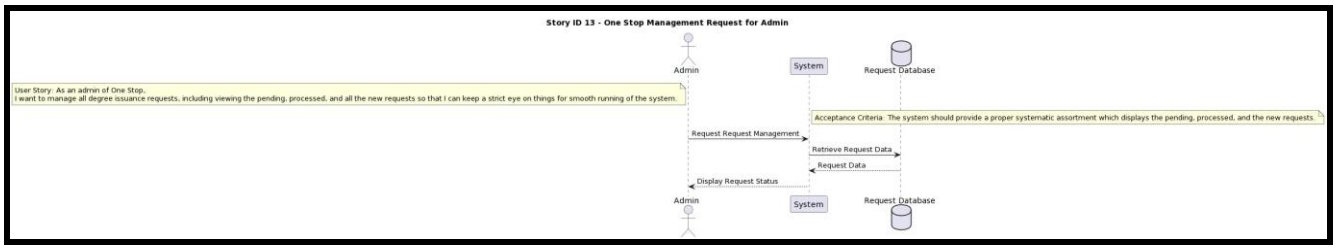

Start Admit Card Issuance
Access Fee Clearance Information
yes
Access Granted?
no
Check Fee Clearance Status
Notify Staff Member: Access Denied
yes
Fees Cleared?
no
Issue Admit Card
Notify Staff Member: Outstanding Balances Found
End Admit Card Issuance
End Admit Card Issuance


Start Budget Management
Access Finance Reports
yes
Access Granted?
no
Generate Reports
Notify Administrator: Access Denied
Analyze Data
End Budget Management

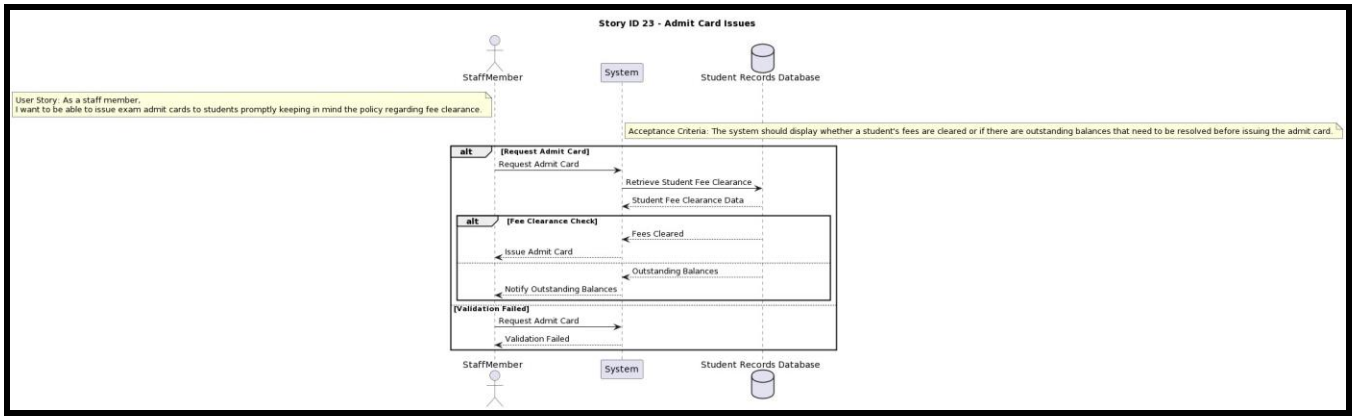

Start Payment Management
Access Payment Confirmation
Access Granted?
yes
no
Confirm Payment
Notify Staff Member: Access Denied
Notify Student: Payment Received
End Payment Management

6.3 Sequence Diagram

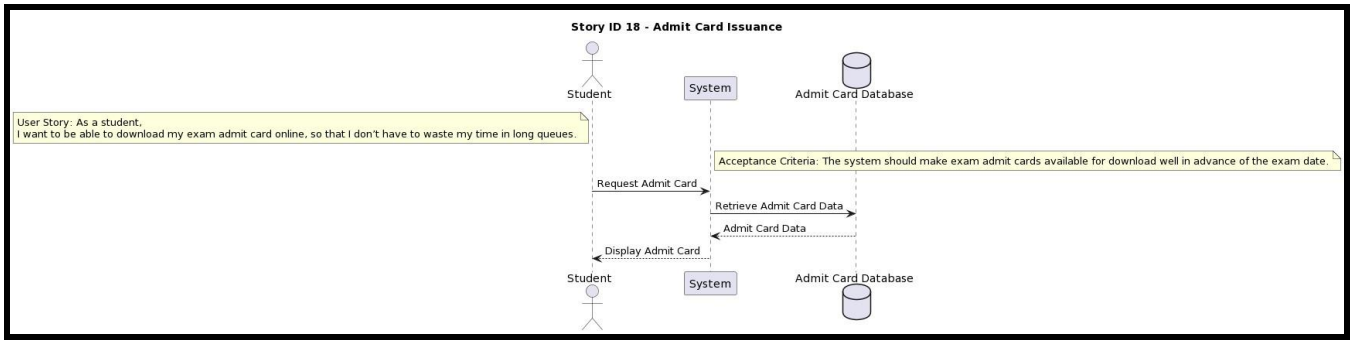
1. Admin Request



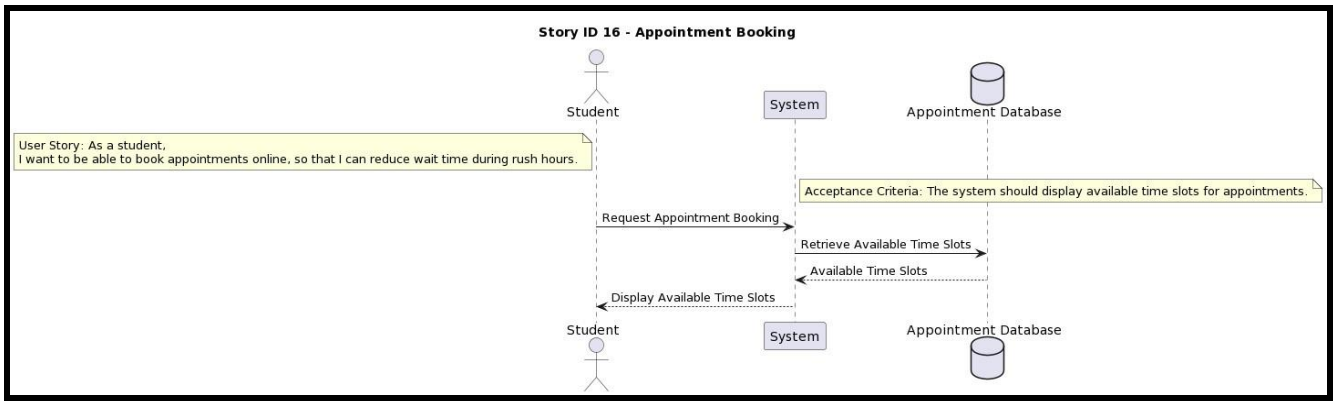
2. Admit Card Issue



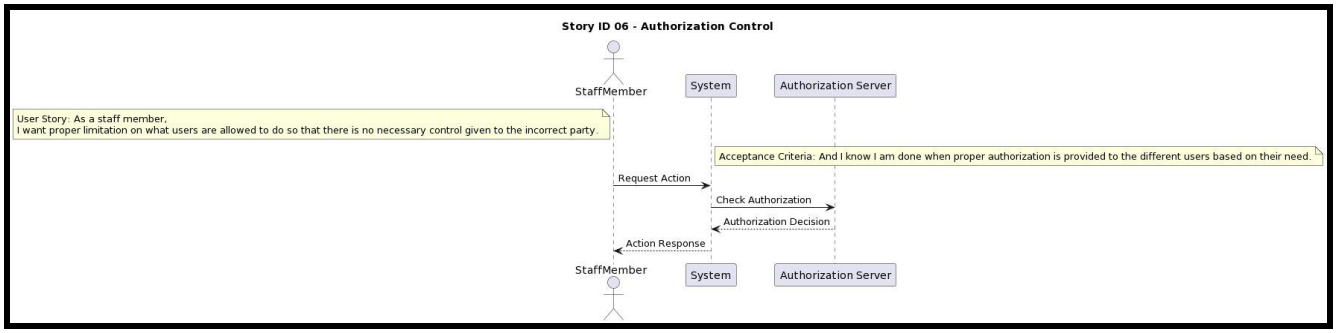
3. Admit Card



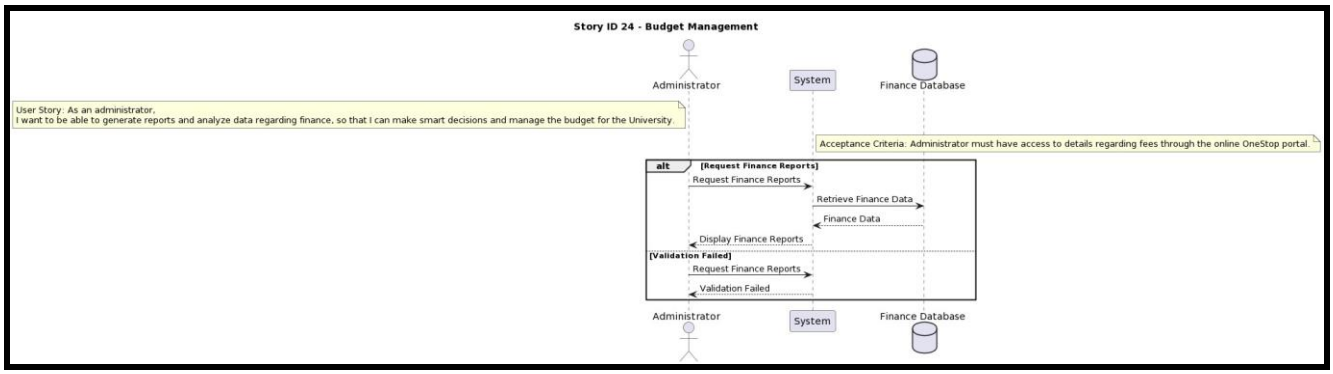
4. Appointment Booking



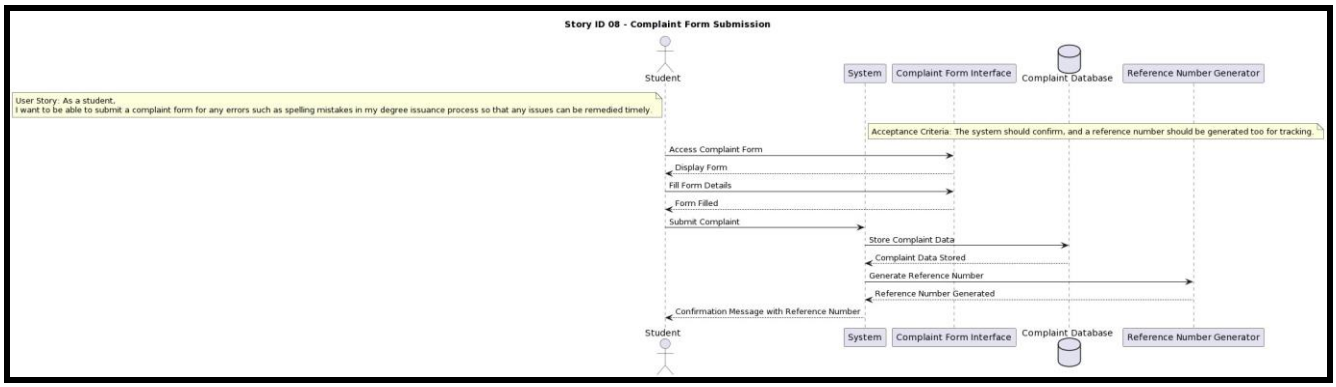
5. Authorization Control



6. Budget Management

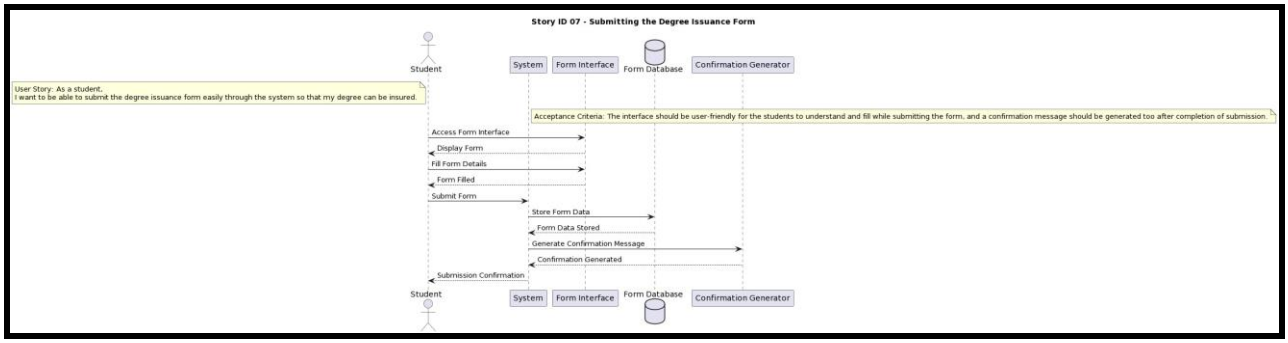


7. Complaint Form

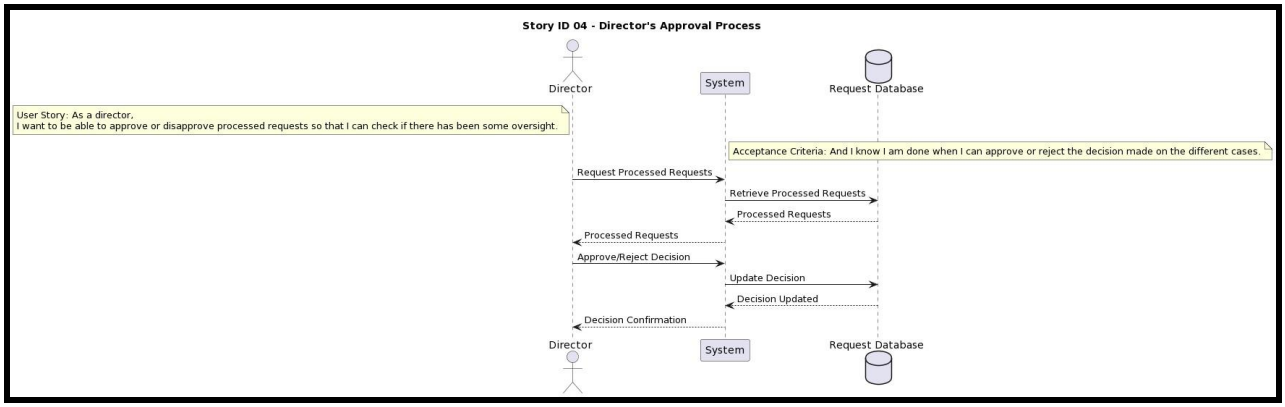


8. Daily Analysis

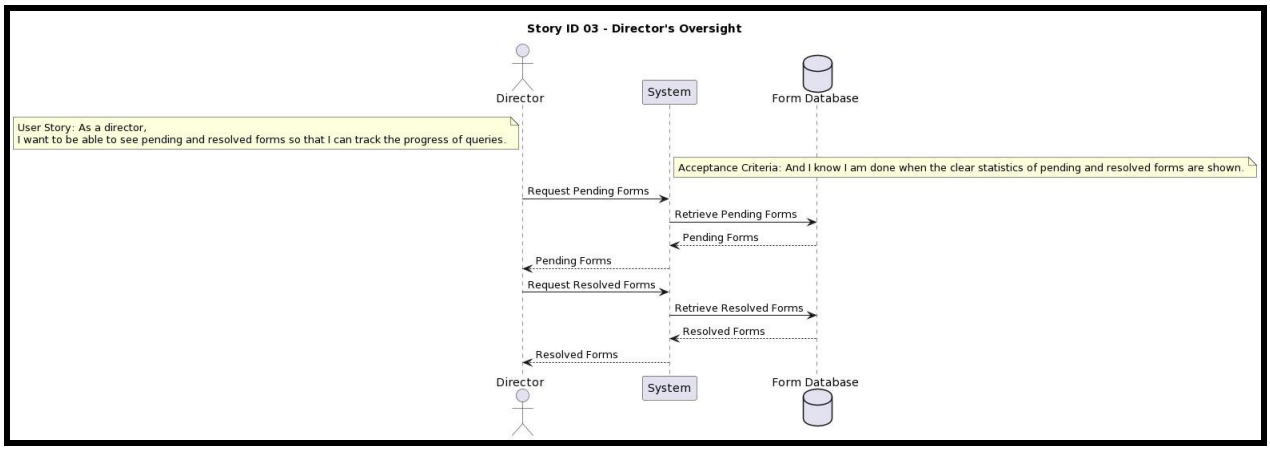
9. Degree Issue



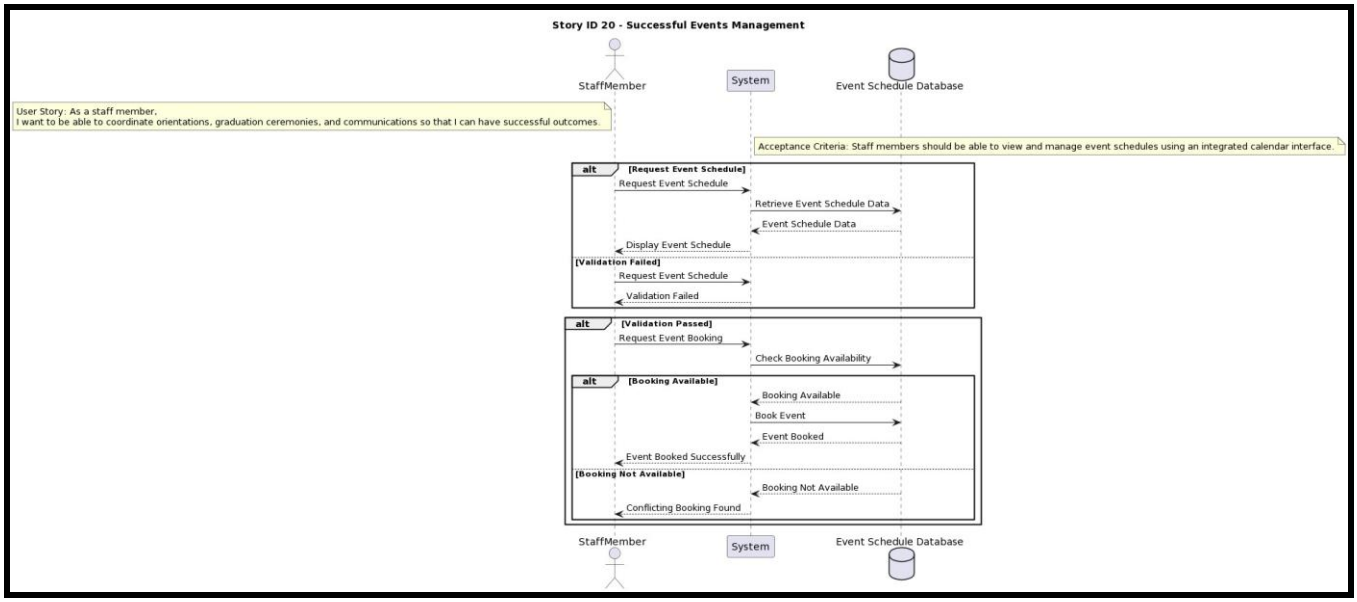
10. Director Approval



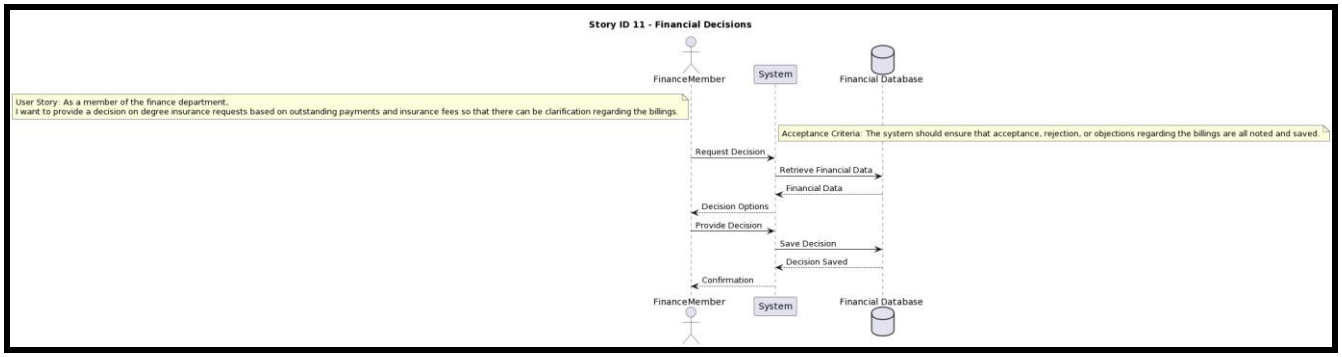
11. Director's Oversight



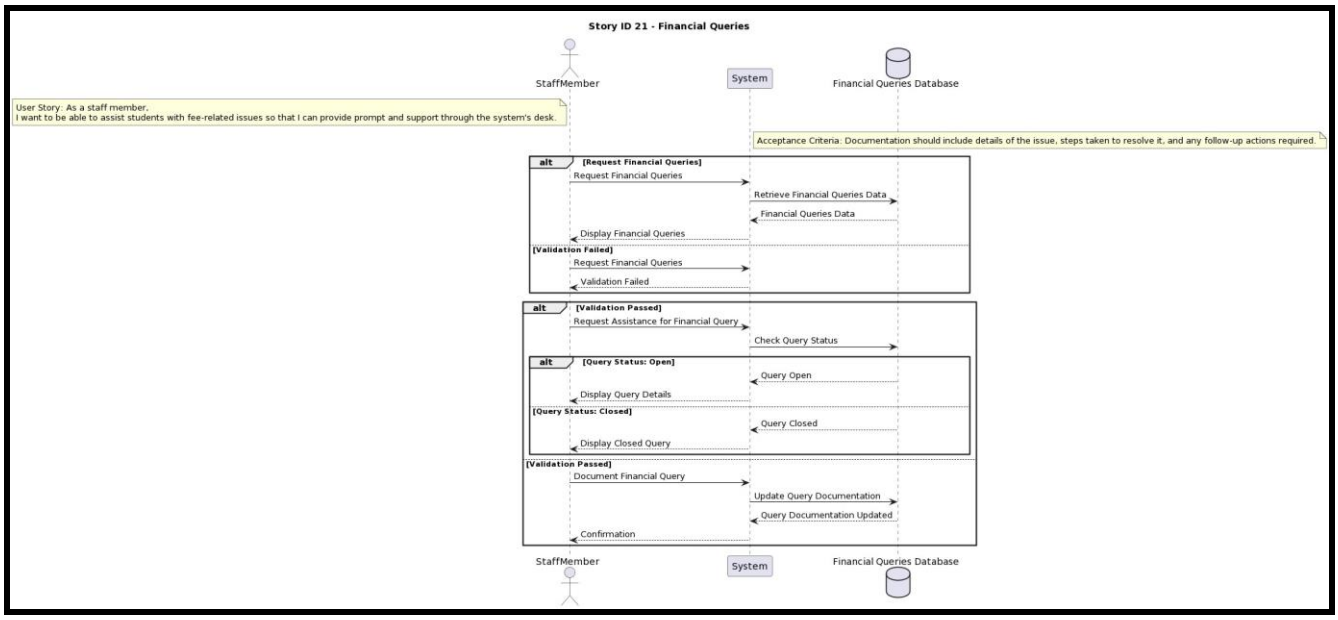
12. Event Management



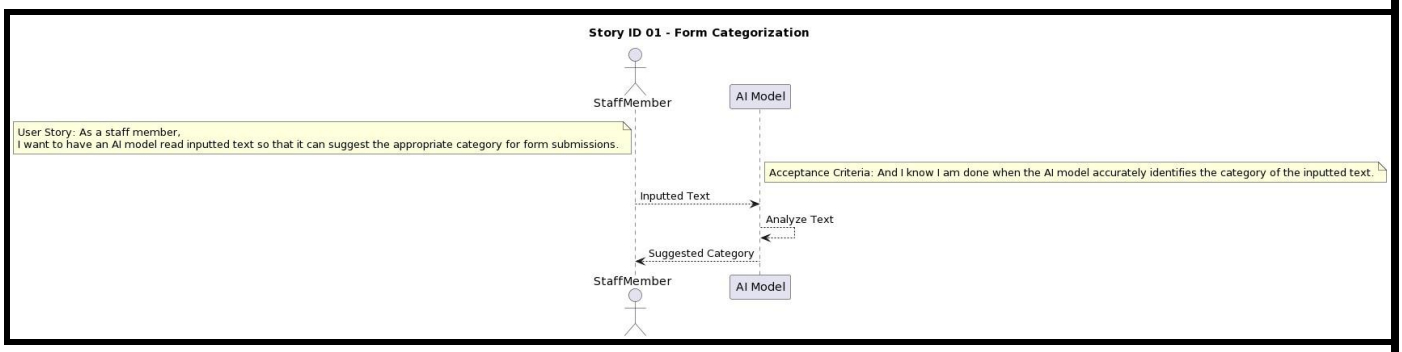
13. Finance Decision



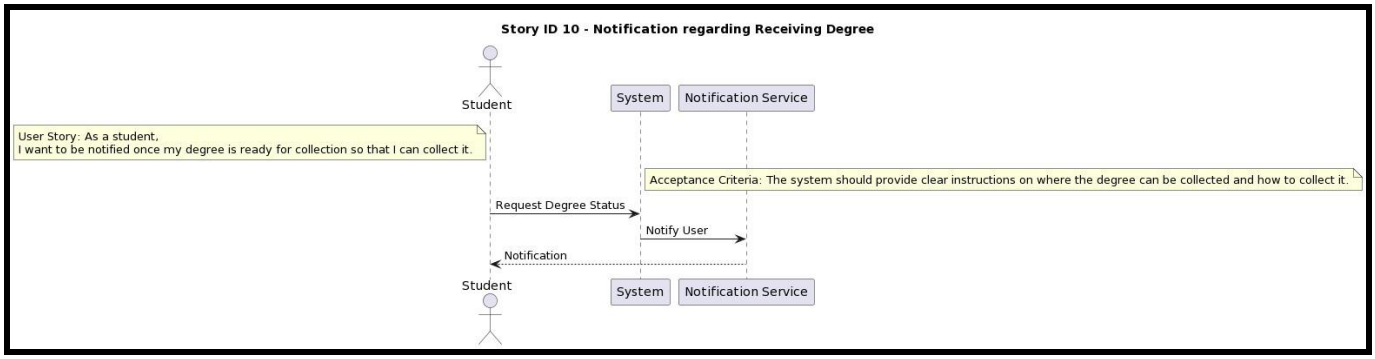
14. Finance Query



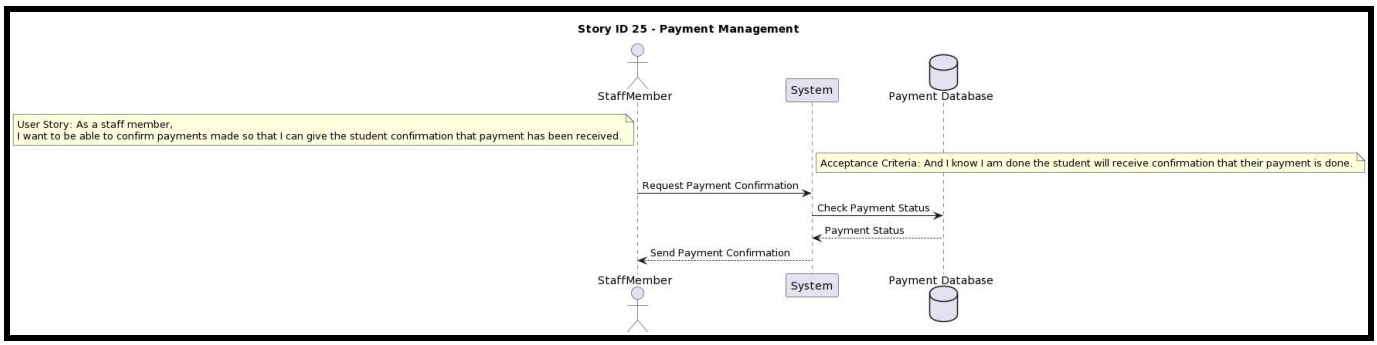
15. Form Categorization



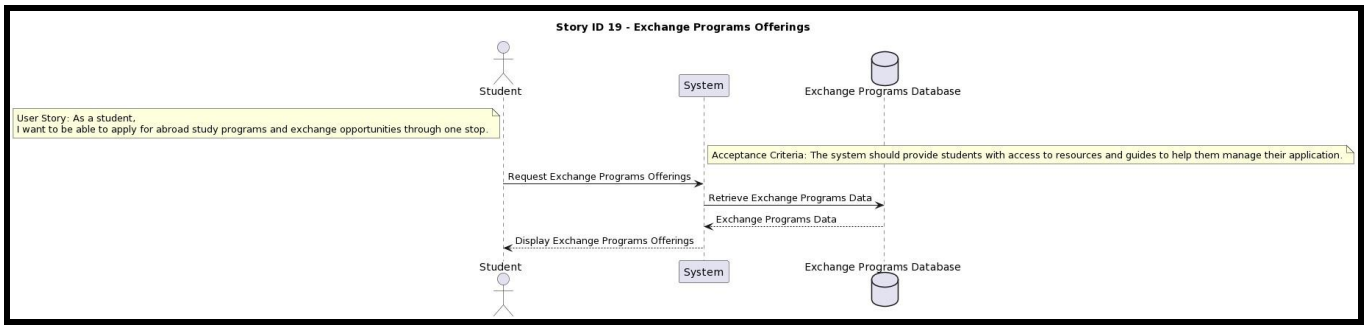
16. Notification regarding receiving Degree



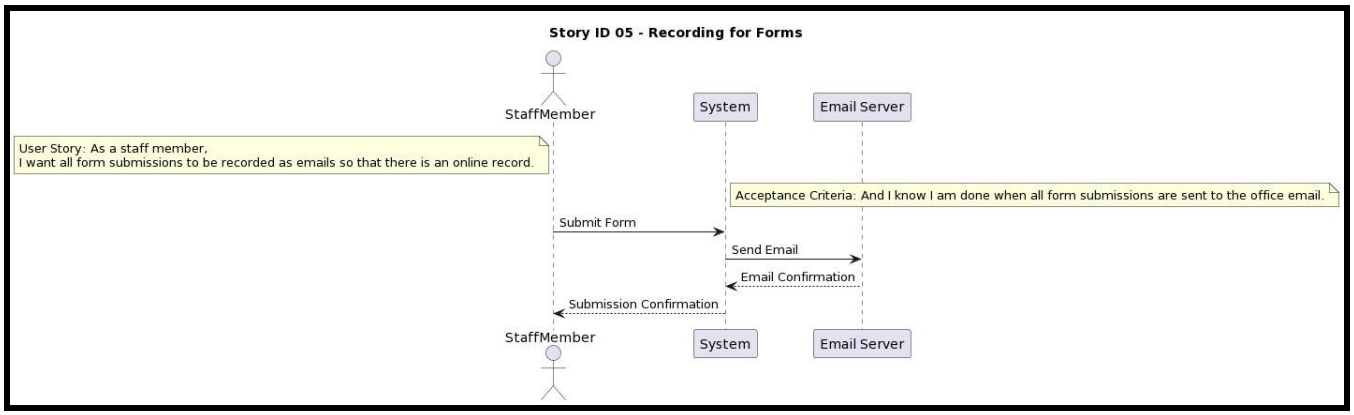
17. Payment Management



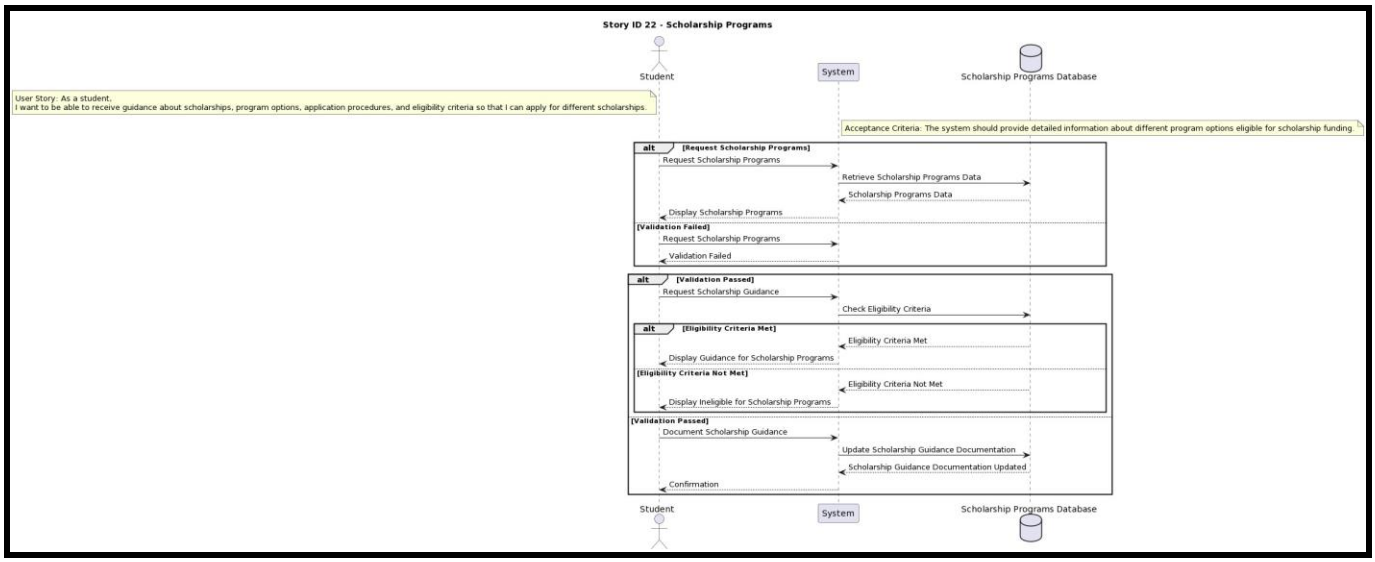
18. Exchange Program Offerings



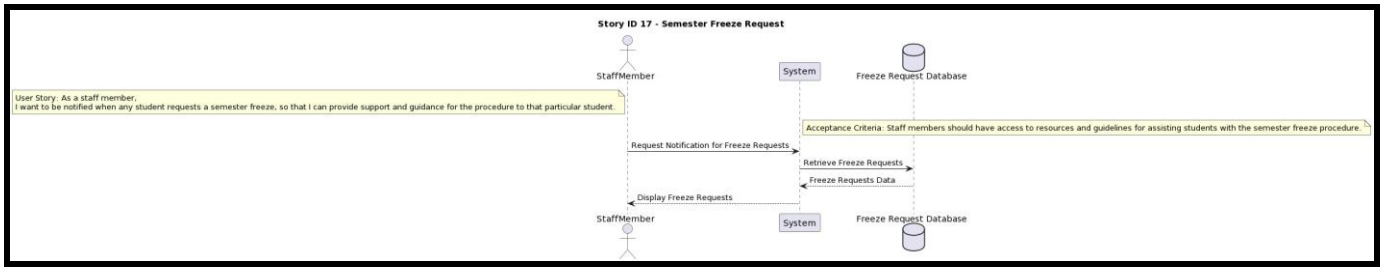
19. Record Form



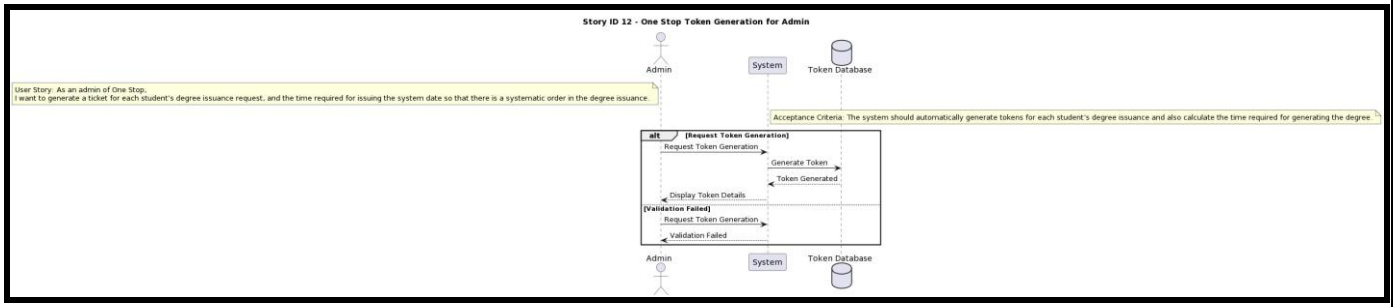
20. Scholarship Program



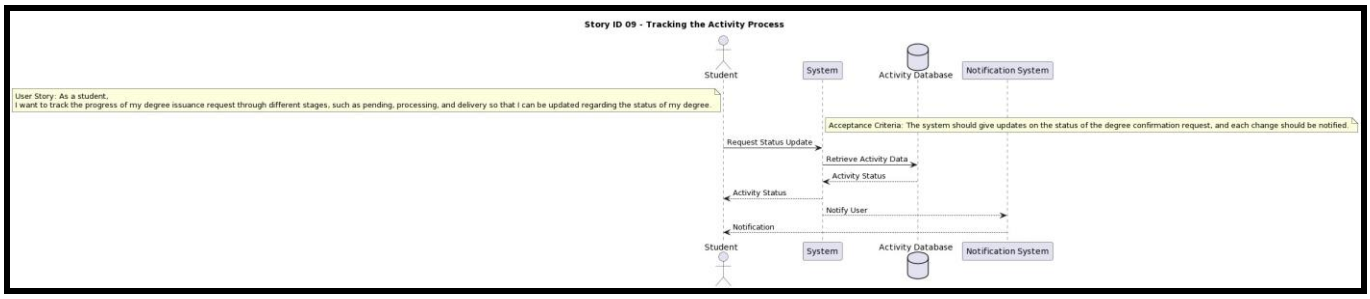
21. Semester Freeze



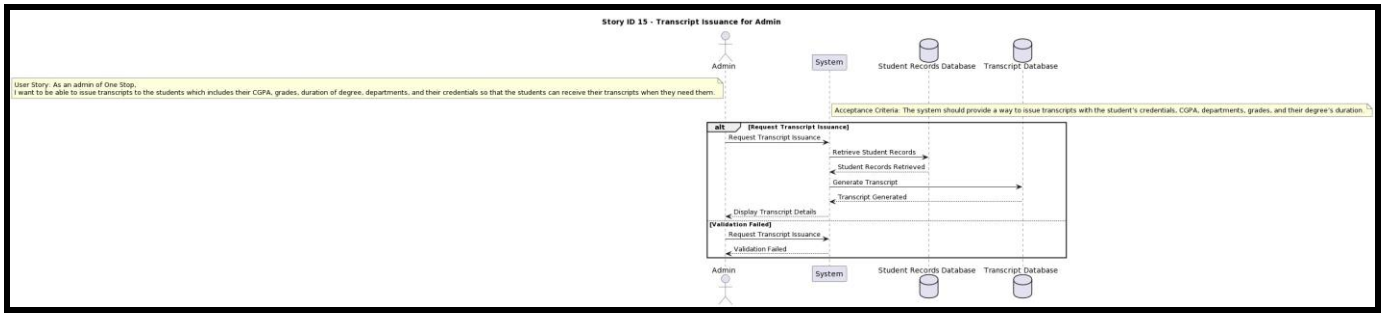
22. Token Generation



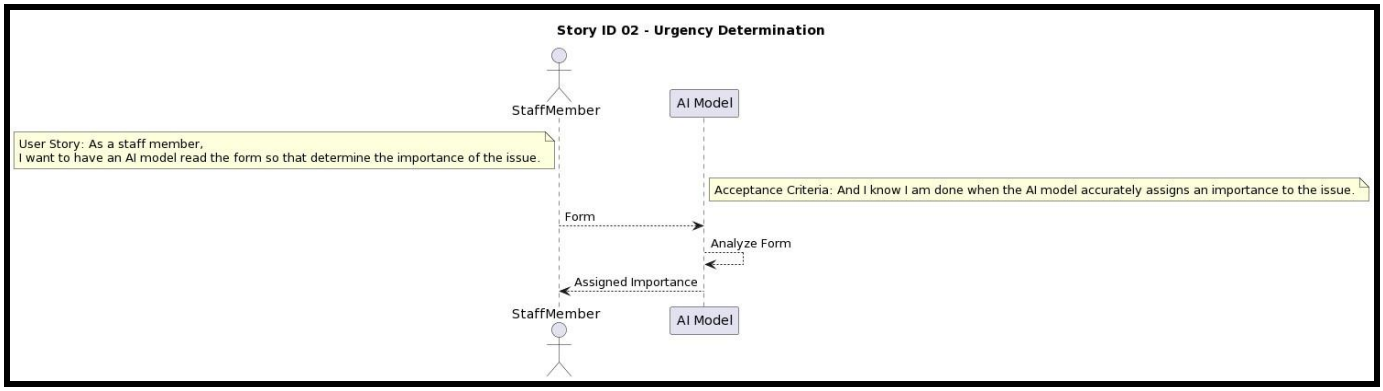
23. Tracking Activity



24. Transcript Issue



25. Urgency Determination

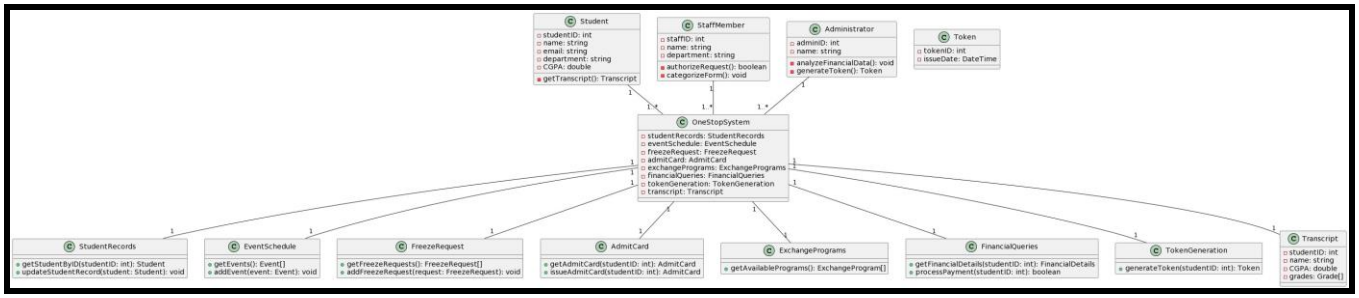


Appendix A: Glossary

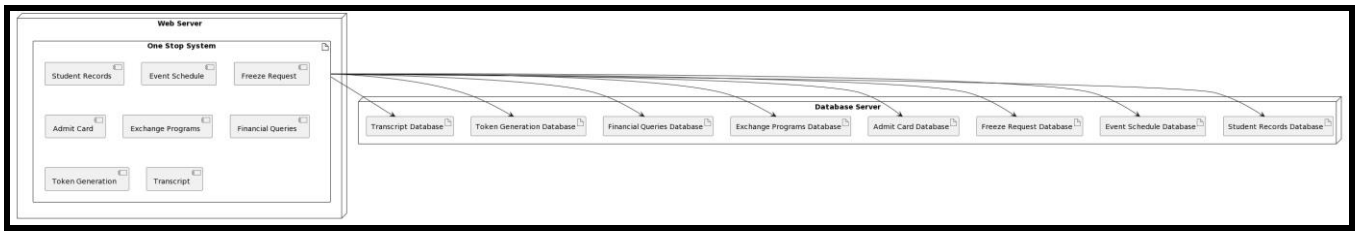
- AI: Artificial Intelligence
- API: Application Programming Interface
- CGPA: Cumulative Grade Point Average
- GUI: Graphical User Interface
- HTTP: Hypertext Transfer Protocol
- HTTPS: Hypertext Transfer Protocol Secure
- SRS: Software Requirements Specification
- SSL: Secure Sockets Layer
- TLS: Transport Layer Security

Appendix B: Analysis Models

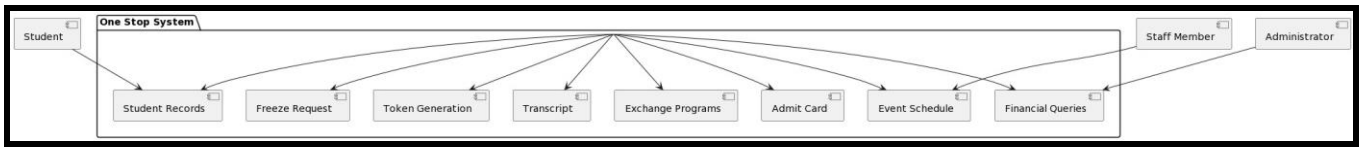
Class Diagram



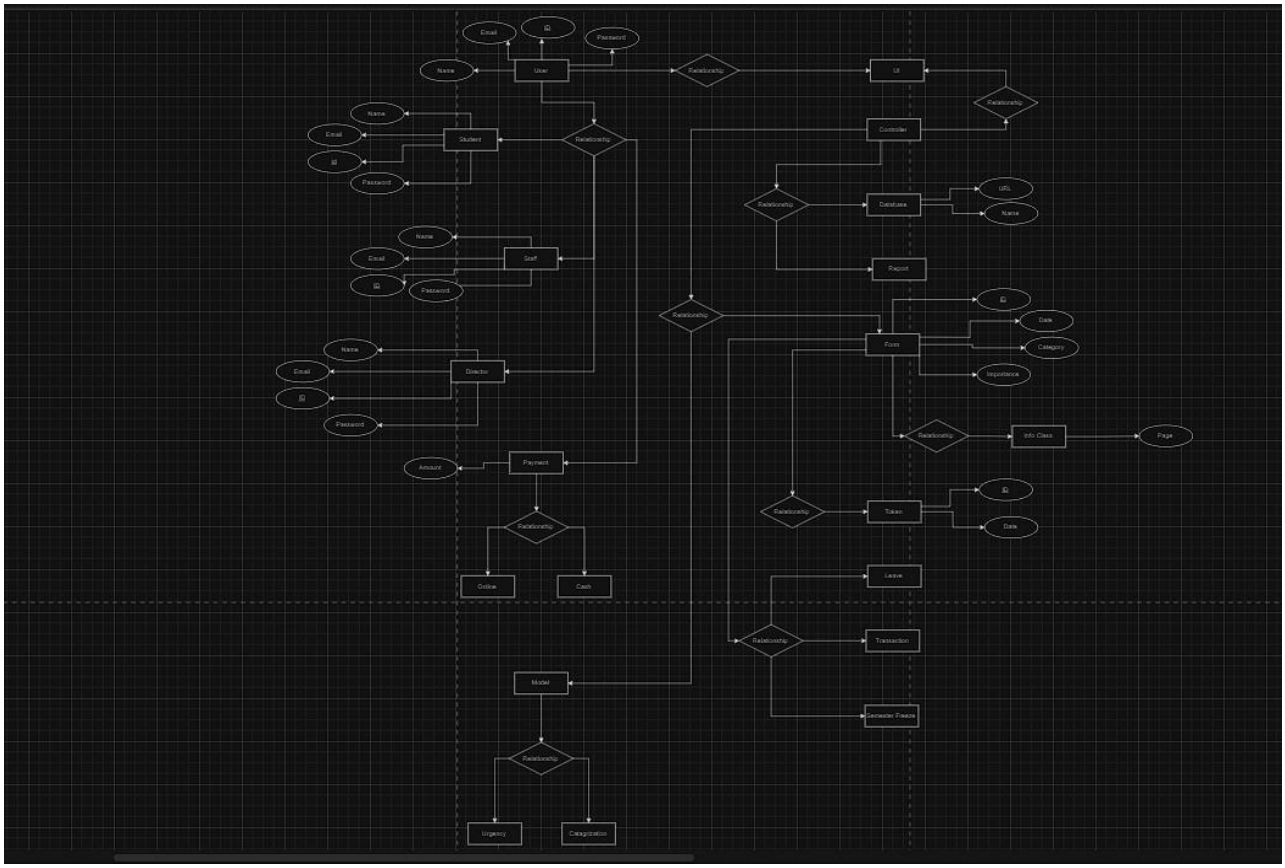
Deployment Diagram



Component Diagram



ERD

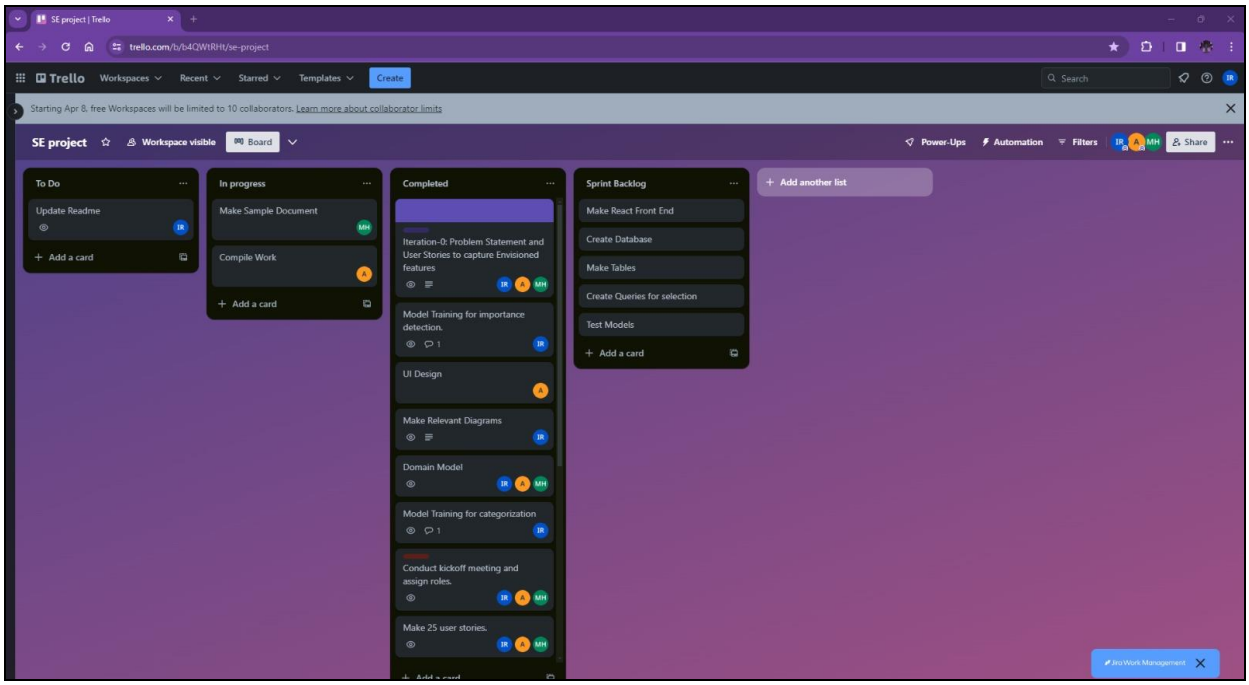


Appendix C: To Be Determined List

- Performance requirements for event handling under peak usage conditions.
- Specific error handling mechanisms to be implemented for data integrity.
- Encryption protocols to be used for data transmission security.
- Audit log details for tracking system access and changes made by users.

Appendix D: Trello & Github Screenshots

Updated Trello Board



Updated Github