

STT	Câu hỏi	Trả lời
1	Cấu trúc mục lục tài liệu của assignment gồm 3 phần lớn và trong các phần lớn có các mục nhỏ hơn do em tự làm hay copy?	100%
	Trên thang điểm 10 em tự chấm điểm cấu trúc tài liệu được bao nhiêu điểm so với yêu cầu đề bài?	8.5/10
2	<b>Phần yêu cầu phần mềm gồm có functional requirements và non-functional requirement. Em tự chấm trên thang điểm 10 sẽ được bao nhiêu điểm so với yêu cầu đề bài?</b>	<b>7.5/10</b>
3	Những yêu cầu nào là yêu cầu phản ánh chính của hệ thống CRM phục vụ cho quản lý data ghi nhận gọi điện, email cho học sinh, phụ huynh học sinh? Input data do học sinh đưa vào hoặc cán bộ đưa vào hệ thống CRM rồi sau đó search, update như thế nào? Em tự chấm trên thang điểm 10 được mấy điểm so với yêu cầu của đề bài?	<b>7.5/10</b>
4	<b>Phần Architecture design cần phải vẽ các hình context diagram, deployment diagram, software packages, môi trường phát triển bao gồm phần cứng, phần frameworks để làm phần mềm, giao thức. Qui tắc chia, hệ thống của em chia ra thành bao nhiêu project nhỏ để code thành project riêng trên IDE. Trao đổi data như thế nào giữa các app nhỏ, giữa các thành phần lớn của hệ thống? Hệ thống sắp xếp theo qui tắc nào hoặc mâu thiết kế nào(design pattern nào)? Em tự chấm phần này được mấy điểm trên thang điểm 10 so với yêu cầu đề bài?</b>	<b>7/10</b>
5	<b>Deployment diagram sẽ mô tả hệ thống CRM của assignment này chạy cho 5 campus Hà Nội, TP HCM, Cần Thơ, Đà Nẵng, Qui Nhơn. Trên thang điểm 10 em tự chấm dc mấy điểm?</b>	<b>7/10</b>
6	<b>Thiết kế architecture thường phải tuân theo các qui tắc thiết kế, em viết nội dung qui tắc và mô tả thiết kế của em thỏa mãn các qui tắc nào? Trên thang điểm 10 em tự chấm dc mấy điểm?</b>	<b>8.5/10</b>
7	<b>Architecture thường để đạt mục tiêu non-functionals. Em mô tả architecture của em đạt mục tiêu non-functional nào theo lý thuyết (vì chưa code, chưa test nên mới chỉ là lý thuyết thôi). Trên thang điểm 10 em tự chấm dc mấy điểm?</b>	<b>7.5/10</b>
8	<b>Phần detail design phải có database table diagram và datadictionary phản ánh yêu cầu của hệ thống CRM quản lý data ghi nhận tương tác, input data của học sinh, của án bộ tuyển sinh. Em tự chấm điểm trên thang điểm 10 thì dc bao nhiêu điểm?</b>	<b>8/10</b>
9	<b>Phần detail design sẽ vẽ 1 class diagram cho 1 feature. Em phải làm ít nhất 5 feature nên sẽ có ít nhất 5 class diagram. Em tự vẽ</b>	<b>9/10</b>

	<b>hay sử dụng lại? Em tự chấm trên thang điểm 10 thì dc bao nhiêu điểm?</b>	
10	<b>Phần detail design sẽ vẽ 1 sequence diagram cho 1 use case (1 use case sẽ là 1 hình elip trên use case diagram, tương ứng với 1 screen name). Sẽ phải làm ít nhất 35 use case. Trên thang điểm 10 em tự chấm được bao nhiêu điểm?</b>	<b>8/10</b>

# **Customer Relationship Management**

## **To Support the Student Admissions**

### **Software Design Document**

\*\*\*

Subject: Software Architecture and Design

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Class: SE1603KS

Student: Do Dinh Nam

Student ID: HE150684

- Hanoi, February 2023 -

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# I. Software Requirements

## 1.1. Functional Requirements

### 1.1.1. System Use Cases

Primary actor	Use cases
Guest	1. View homepage 2. Register account 3. View university's information 4. View academic programs 5. View campus maps 6. View housing information 7. View admission information
User	8. Login 9. Log out 10. View profile 11. Edit profile 12. Change password 13. Setting 14. View notifications 15. Forget password
Prospective student	16. Sign up for consultation 17. Apply for admission 18. Apply for financial aid 19. Apply for scholarship 20. Track application 21. Register assessment test 22. View assessment test information 23. View assessment test result 24. Contact admission counselor 25. Pay enrollment 26. View campus news and events 27. View extracurricular activity
Admissions staff	28. Manage applications 29. Evaluate applications 30. Contact with applicants 31. Generate offer letters 32. Process deposits 33. Manage admission events 34. Generate admission reports 35. Manage admission policies and procedures
Exam officer	36. Manage exam schedule 37. Monitor exam results 38. Manage exam logistics 39. Report exam performance

Marketing staff	40. Develop campaigns 41. Segment prospective students 42. Track campaign 43. Coordinate events 44. Manage social media 45. Generate marketing reports 46. Manage partnerships
System administrator	47. Manage user account 48. Monitor system performance 49. Manage integrations 50. Manage upgrades and updates

### 1.1.2. Use Case Diagram

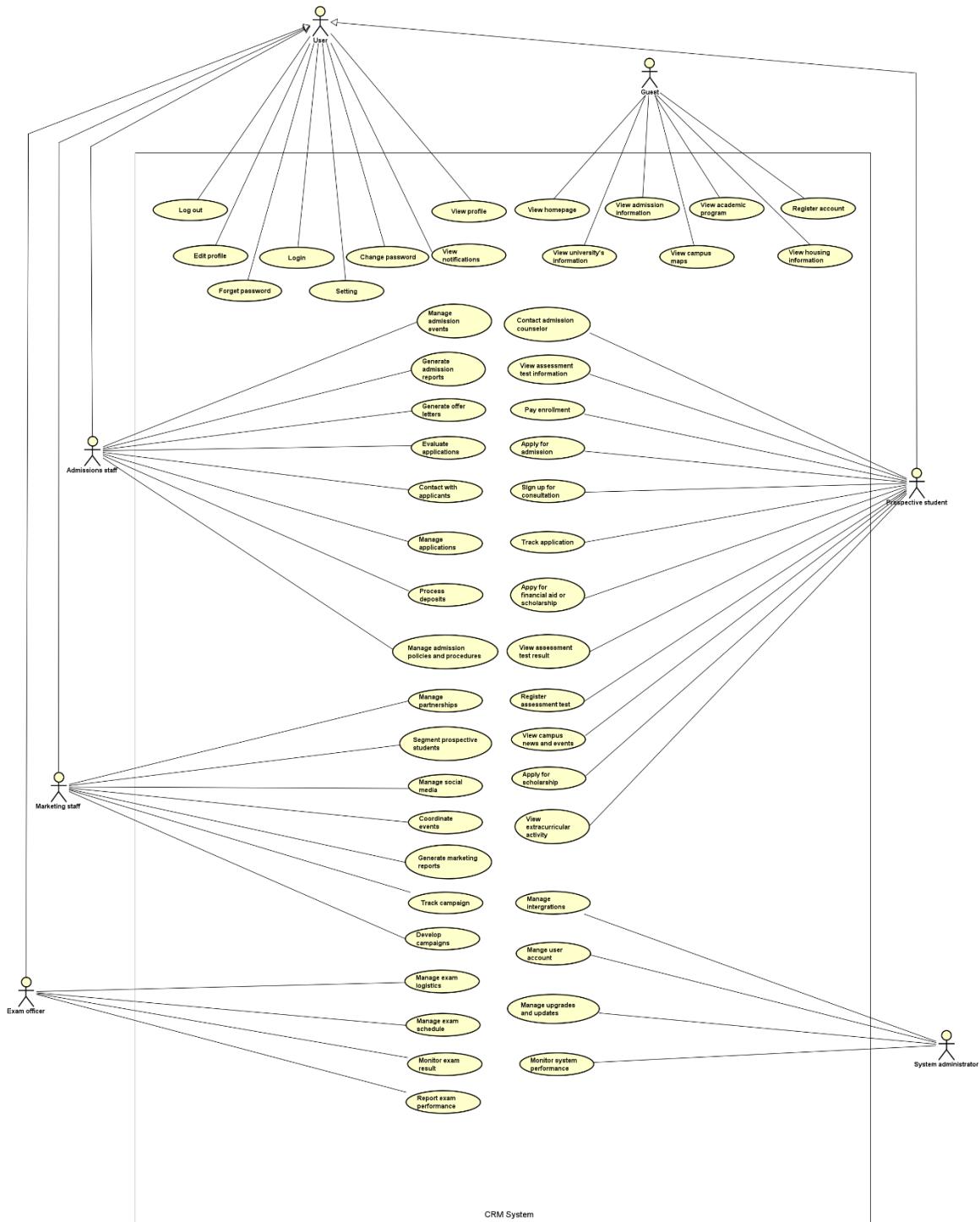


Figure 1. Use case diagram.

### 1.1.3. Feature Tree

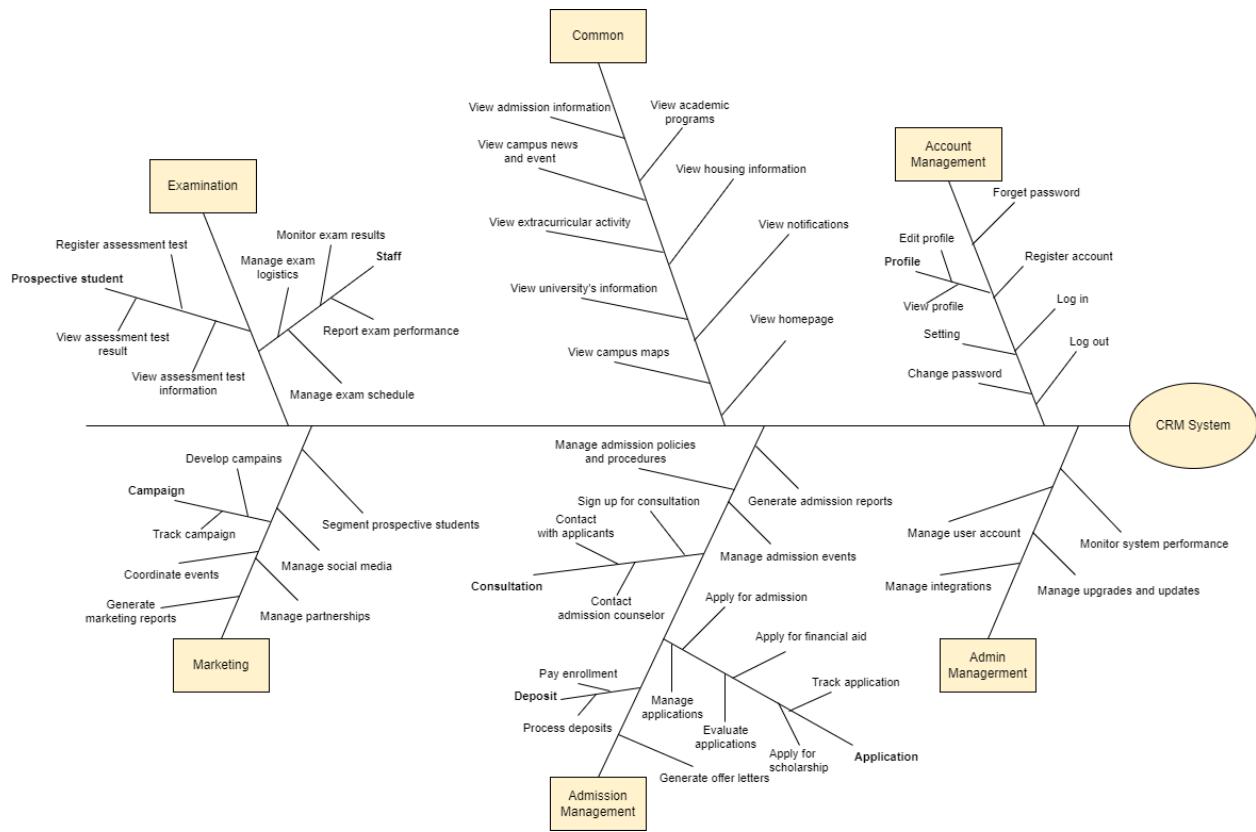


Figure 2. Feature tree.

#### 1.1.4. Screen Flow

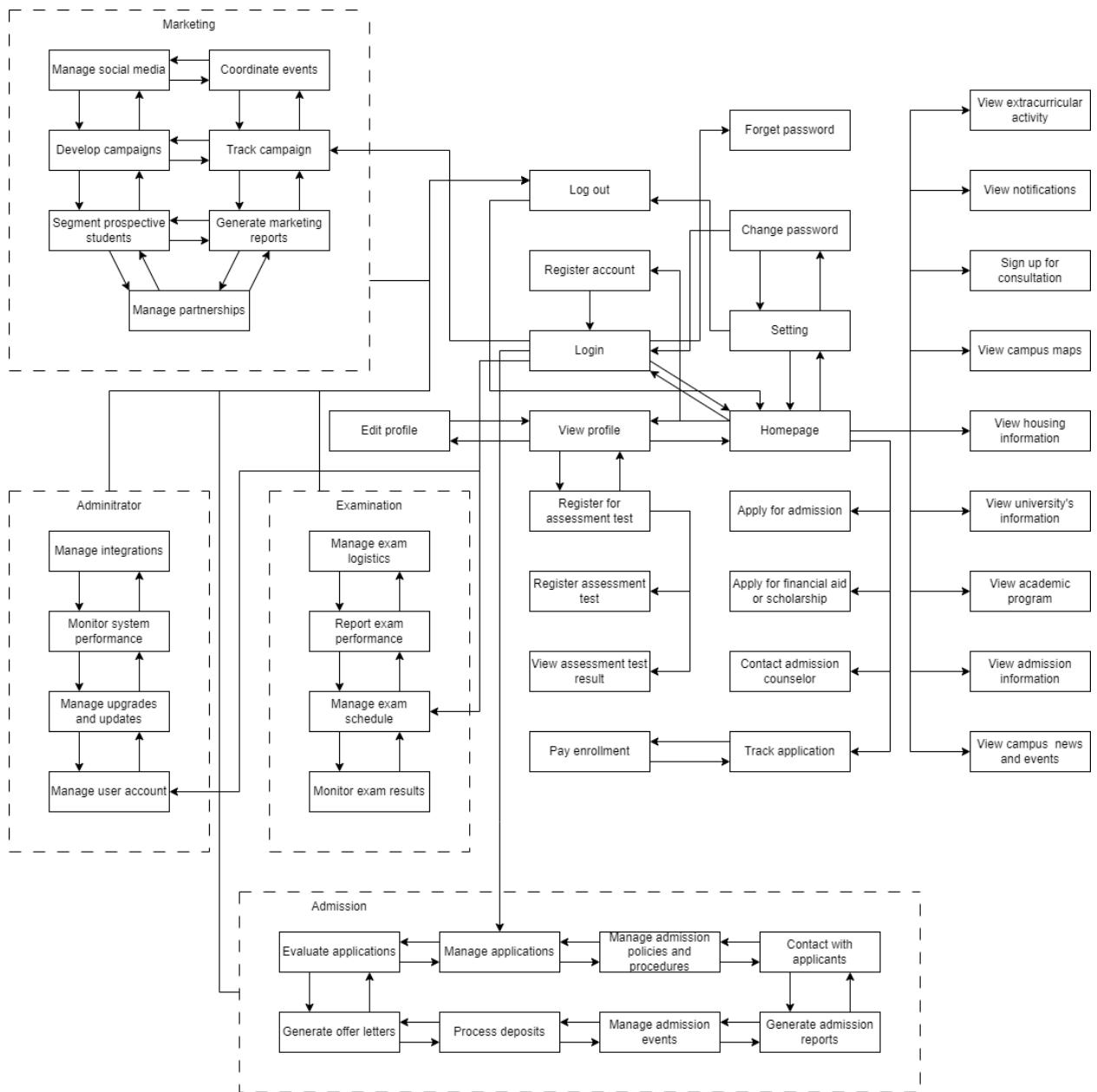


Figure 3. Screen flow.

#### 1.2. Non-Functional Requirements

##### - Usability:

USA-1. The staff within 1 day training can easily use the system.

##### - Performance:

PER-1. The system should be responsive and loading times less than 2 seconds.

PER-2. The system can allow 10000 users access at the same time.

##### - Scalability:

SCA-1. The system should be able to manage up to 100000 users and data and be easily expandable to 500000 users in the future.

**- Security:**

SEC-1. The system should be secure and protect user data from unauthorized access or disclosure.

**- Compatibility:**

COM-1. The system should be compatible with computer, phone, tablet.

COM-2. The system should be compatible with both Windows and MacOS operating system on computer.

COM-3. The system should be compatible with browsers such as Google Chrome, Microsoft Edge, Opera, Brave, Firefox.

COM-4. The system should be compatible with both Android and IOS operating system on phone and tablet.

**- Maintainability:**

MAI-1. The maintain or update time have to maximum is 30 minutes downtime and disruption to users.

## II. Software Architecture Design

### 2.1. Context Diagram

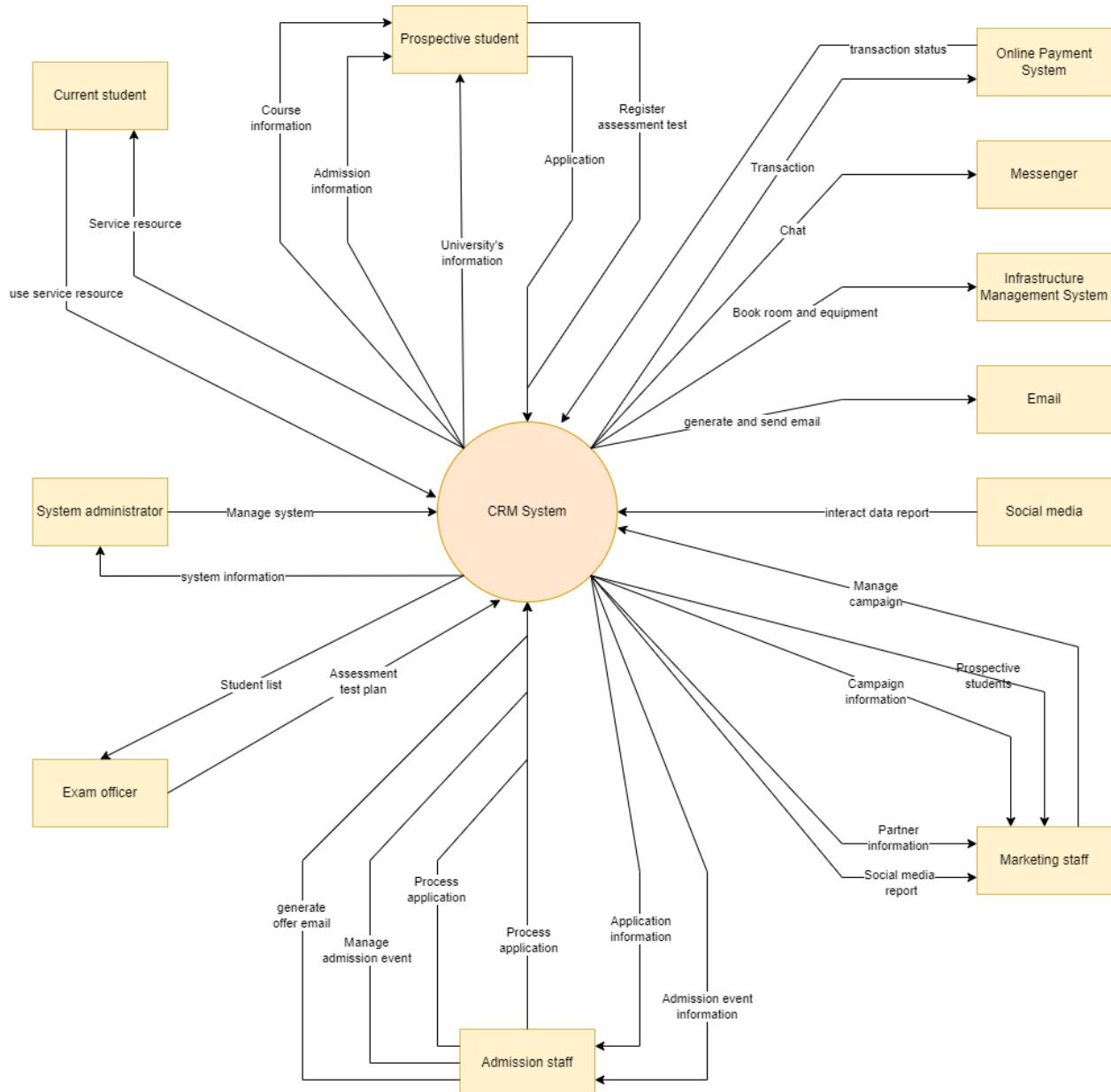


Figure 4. Context diagram.

## 2.2. Component Diagram

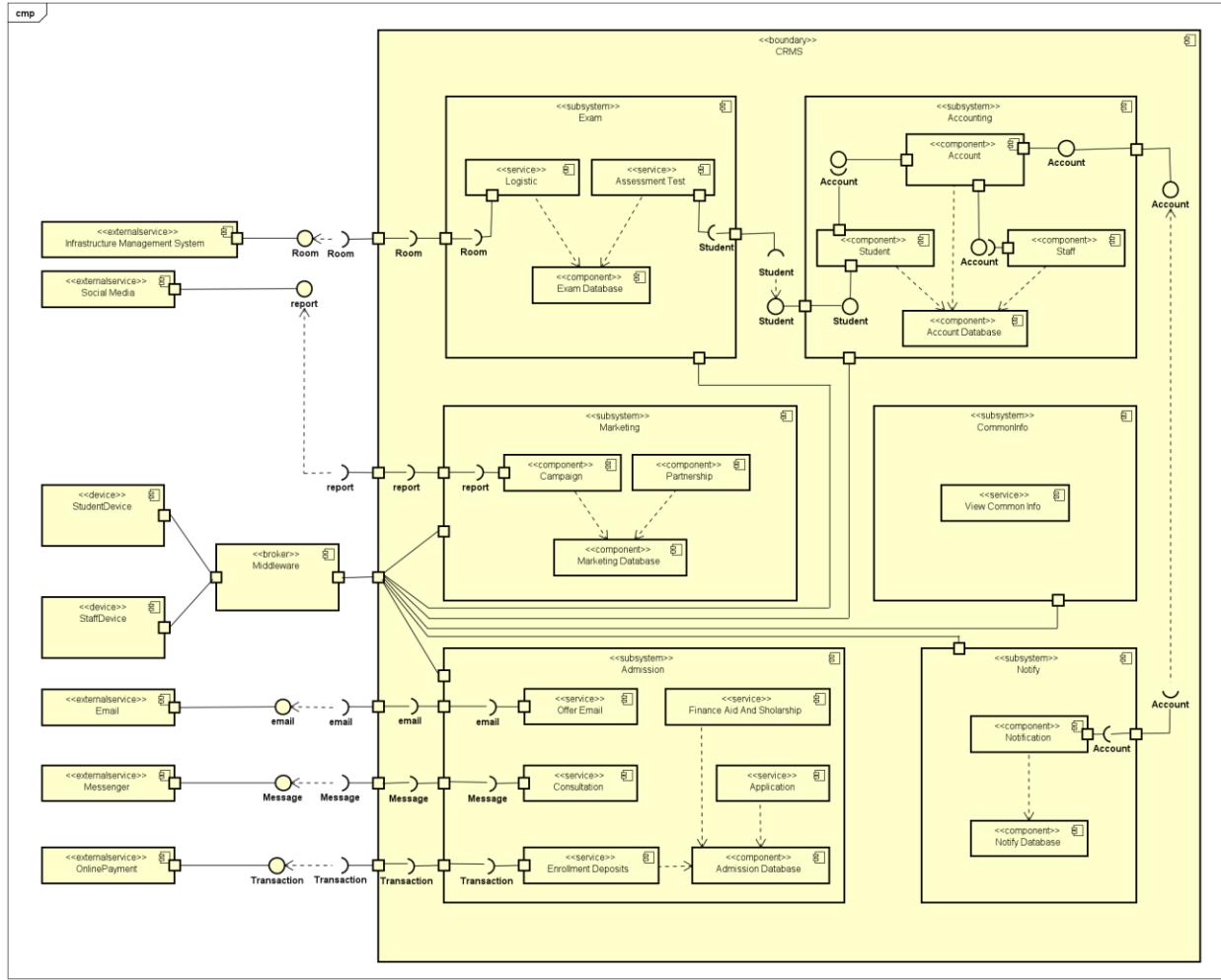


Figure 5. Component diagram.

### 2.3. Deployment Diagram

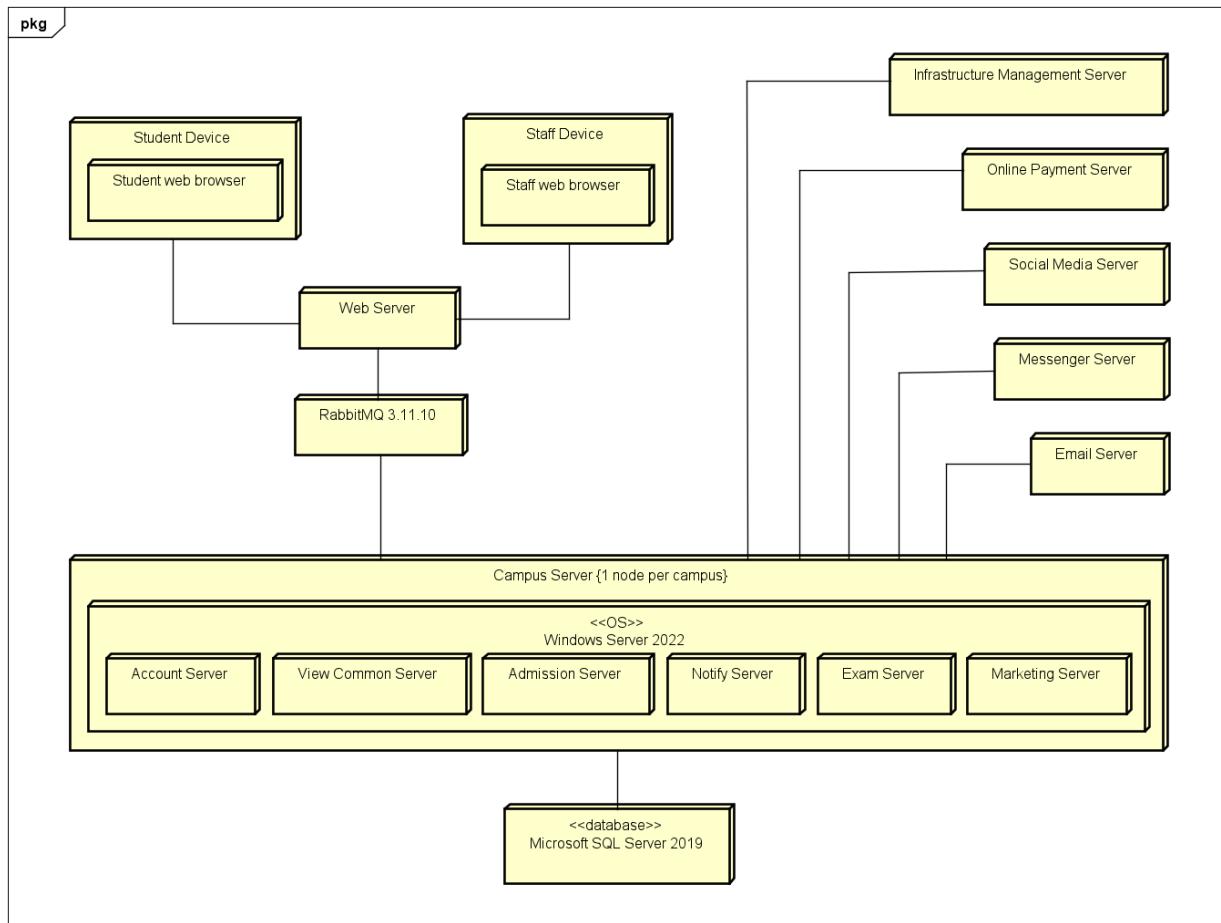


Figure 6. Deployment diagram.

## 2.4. Source Code Structure

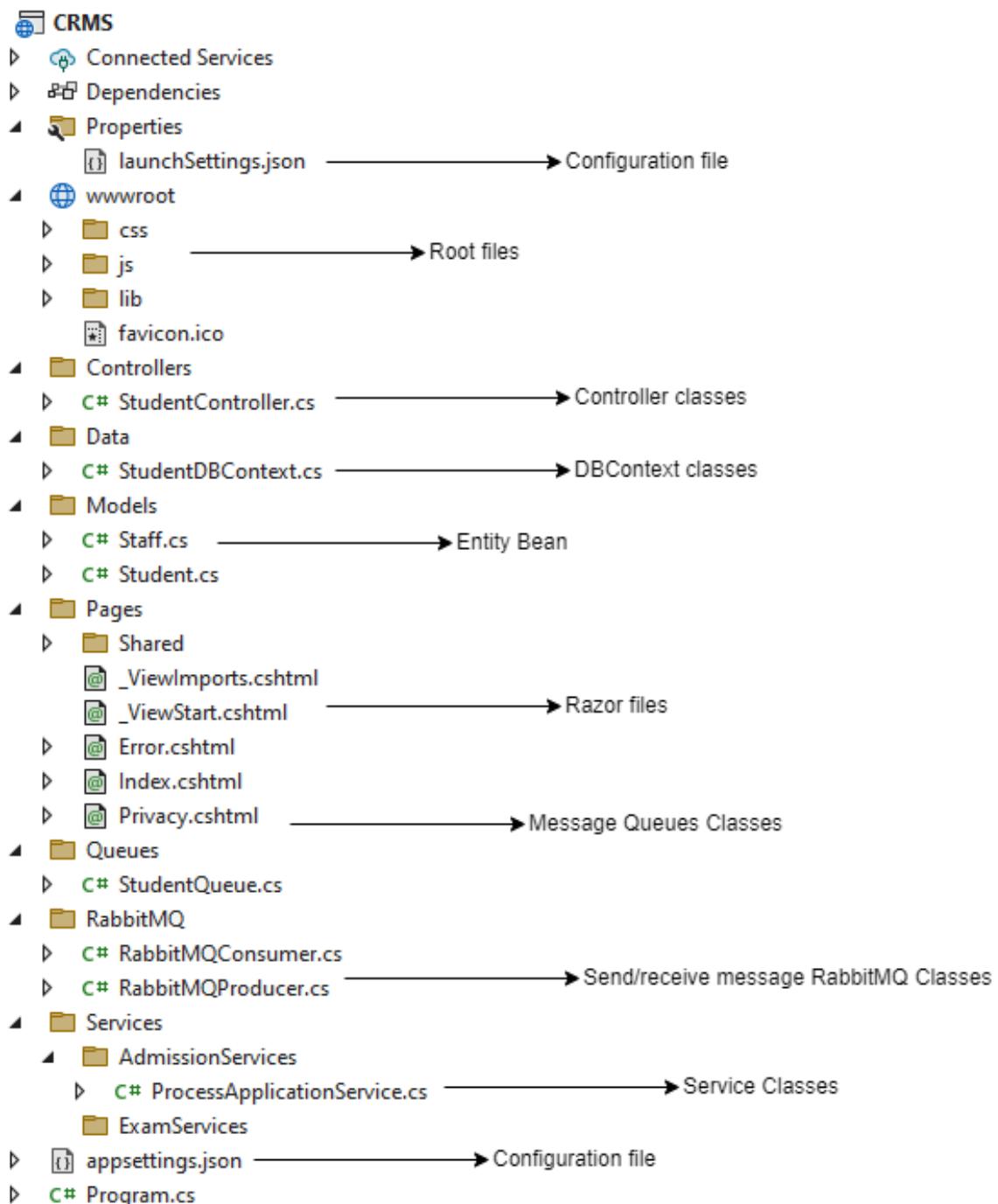


Figure 7. Source code structure.

## 2.5. Development environment

### Hardware

Device	OS	CPU	RAM	Storage
Laptop MSI Prestige 14	Windows 11 22H2	Intel core i5 – 8250u	8 GB	256 GB
Samsung Galaxy S8 plus	Android 10	Exynos 8895	6 GB	128 GB

### Software

Software	Version
Visual Studio	2022
Microsoft SQL Server	2019
RabbitMQ	3.11.10

### Framework

Framework	Version
ASP.NET Core	6.0

## 2.6. Database

### 2.6.1. Database Table Diagram

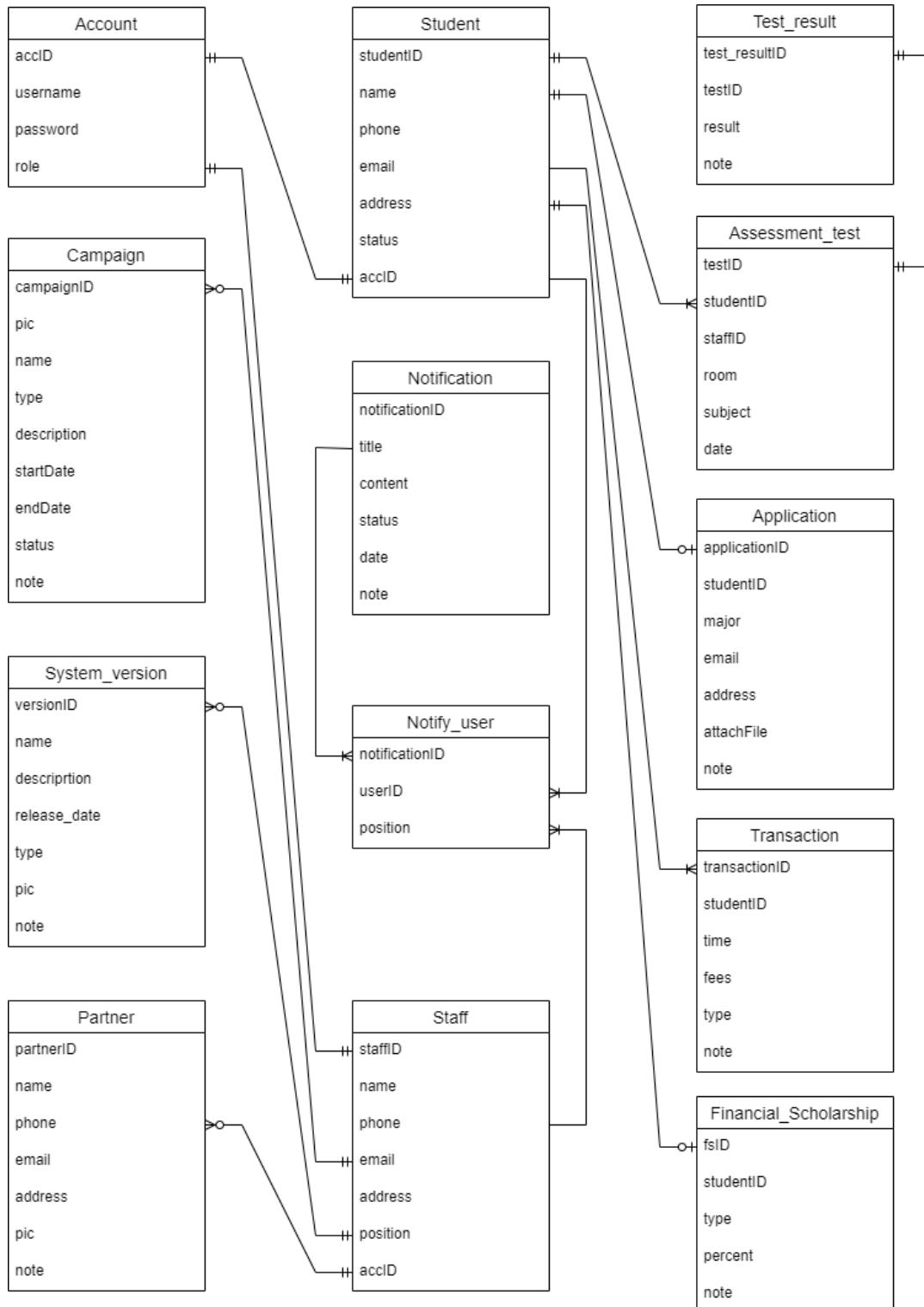


Figure 7. Entity relationship diagram.

## 2.6.2. Data Definition

### Account

Field name	Type	Description
accID	int	PK
username	varchar(50)	
password	varchar(50)	
role	int	

### Student

Field name	Type	Description
studentID	int	PK
name	varchar(50)	
phone	varchar(10)	
mail	varchar(100)	
address	varchar(255)	
status	bit	
accID	int	FK

### Staff

Field name	Type	Description
staffID	int	PK
name	varchar(50)	
phone	varchar(10)	
mail	varchar(100)	
address	varchar(255)	
position	int	
accID	int	FK

### Assignment\_test

Field name	Type	Description
testID	int	PK
studentID	int	FK
staffID	int	FK
room	varchar(5)	
subject	String	
date	date	

### Test\_result

Field name	Type	Description
test_resultID	int	PK
testID	int	FK
result	int	

note	int	
------	-----	--

### Campaign

Field name	Type	Description
campaignID	int	PK
pic	int	FK
name	varchar(100)	
type	varchar(50)	
description	varchar(255)	
startDate	date	
endDate	date	
status	bit	
note	varchar(255)	

### Notification

Field name	Type	Description
notificationID	int	PK
title	varchar(100)	
content	varchar(255)	
status	bit	
date	date	
note	varchar(255)	

### Application

Field name	Type	Description
applicationID	int	PK
studentID	int	FK
major	String	
email	varchar(100)	
address	varchar(255)	
attachFile	varchar(255)	
note	varchar(255)	

### System\_version

Field name	Type	Description
versionID	int	PK
name	varchar(100)	
description	varchar(255)	
release_date	date	
type	int	
pic	int	FK
note	varchar(255)	

### **Notify\_user**

Field name	Type	Description
notificationID	int	FK, PK
userID	int	FK, PK
position	int	

### **Transaction**

Field name	Type	Description
transactionID	int	PK
studentID	int	FK
time	dateTime	
fees	money	
type	varchar(50)	
note	varchar(255)	

### **Partner**

Field name	Type	Description
partnerID	int	PK
name	varchar(100)	
phone	varchar(10)	
email	varchar(100)	
address	varchar(255)	
pic	int	FK
note	varchar(255)	

### **Financial\_Scholarship**

Field name	Type	Description
fsID	int	PK
studentID	Int	FK
type	bit	
percent	int	
note	varchar(255)	

### III. Software Detail Design

#### 3.1. Common

##### 3.1.1. Class Diagram

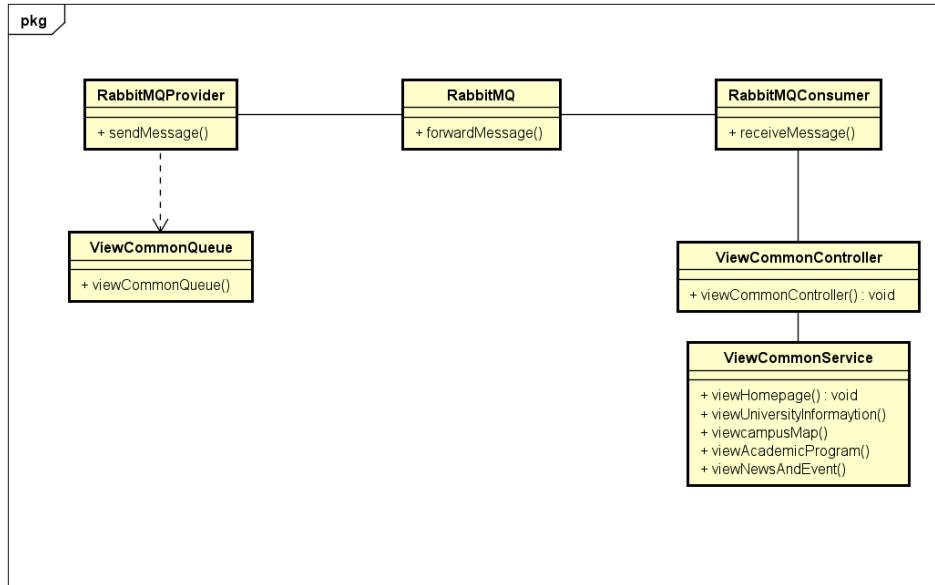


Figure 8. Common feature class diagram.

##### 3.1.3. Screen Design

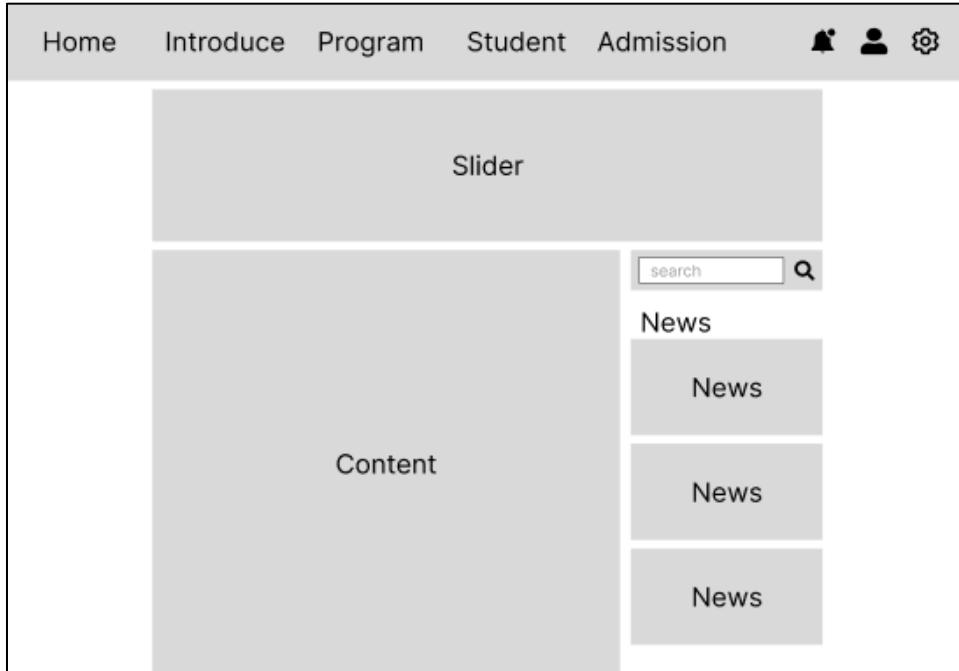


Figure 9. View Homepage screen design

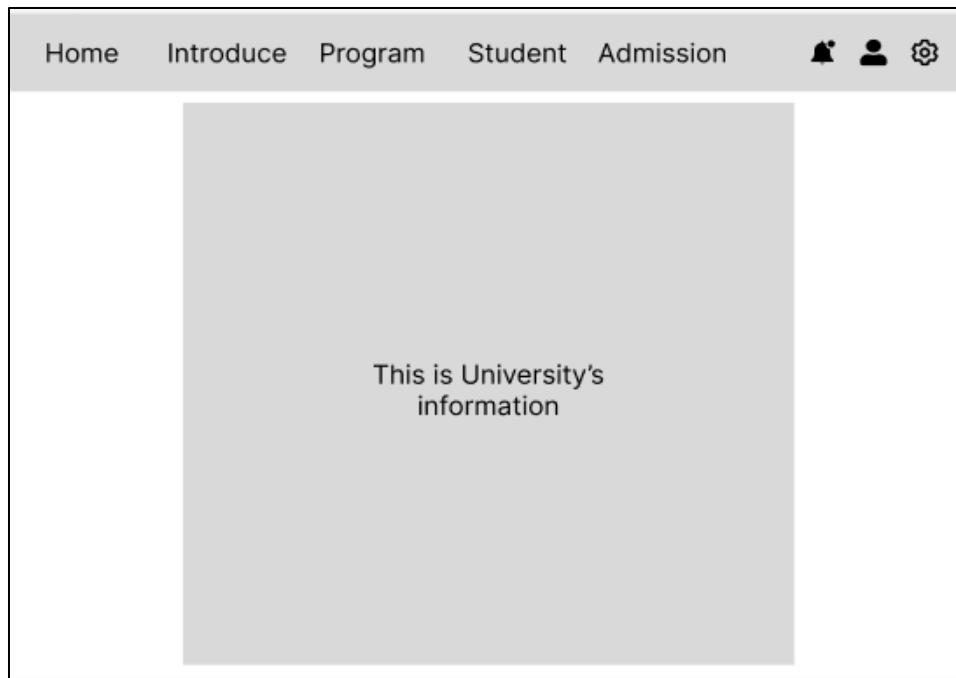


Figure 10. View University Information screen design

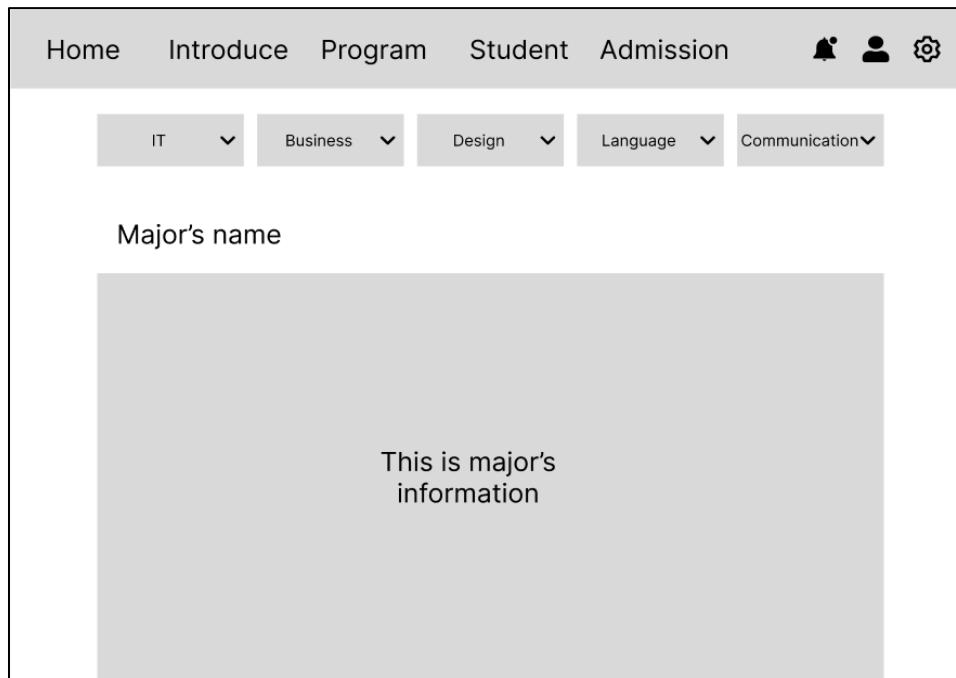


Figure 11. View Major Information screen design

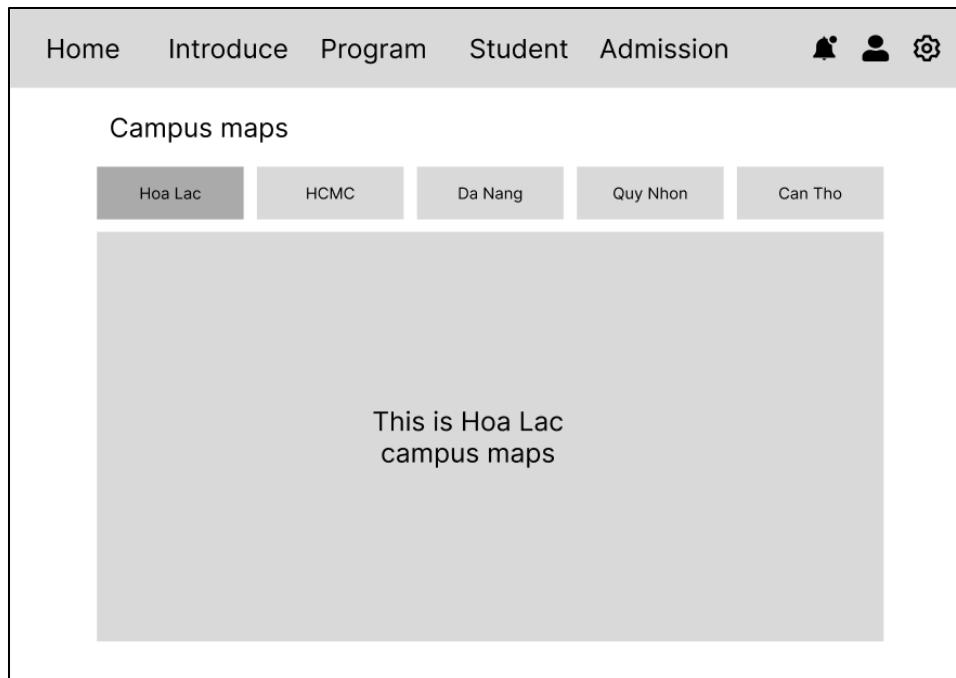


Figure 12. View Campus Map screen design

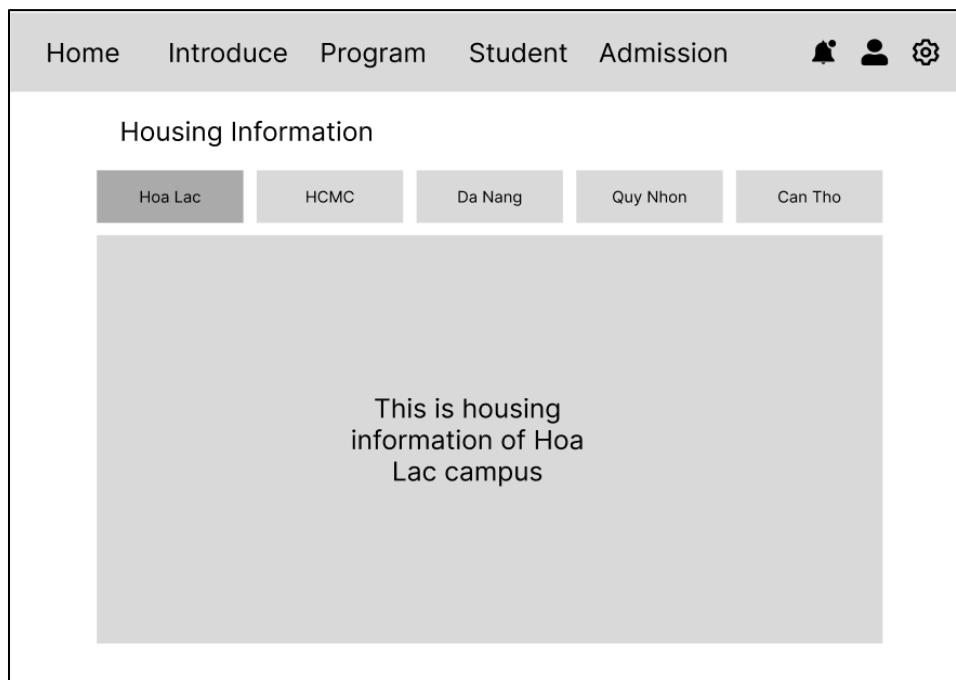


Figure 13. View Housing Information screen design

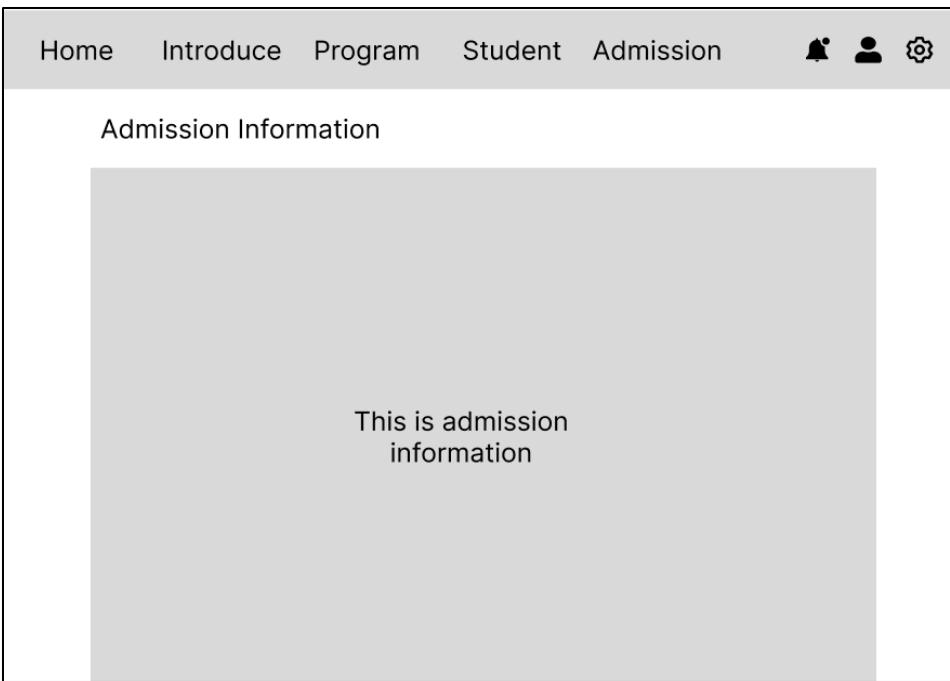


Figure 14. View Admission Information screen design

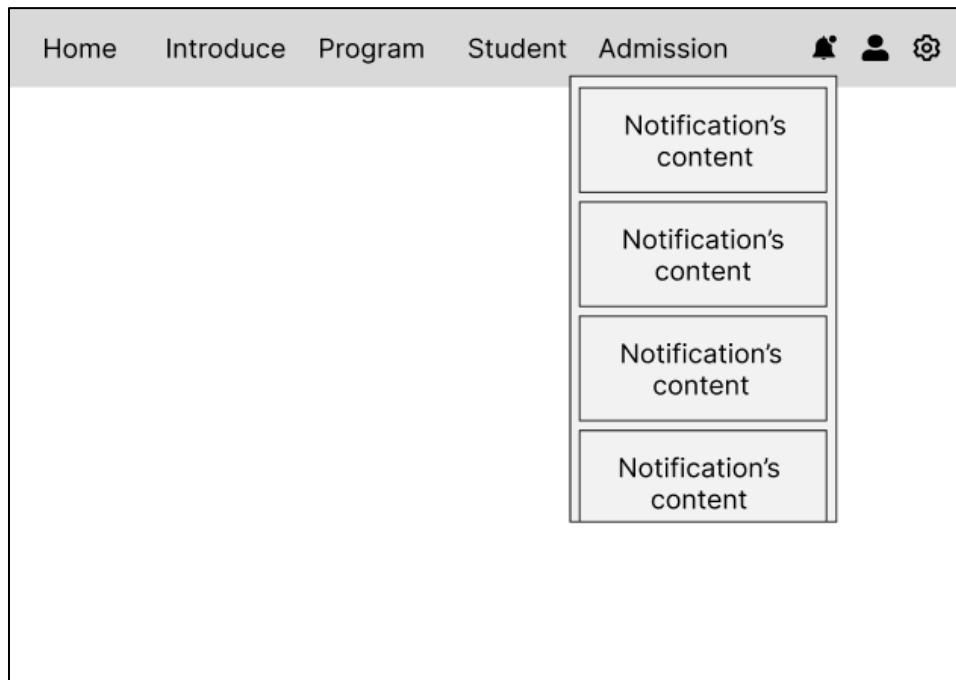


Figure 15. View Notification screen design

### 3.1.4. Sequence Diagram

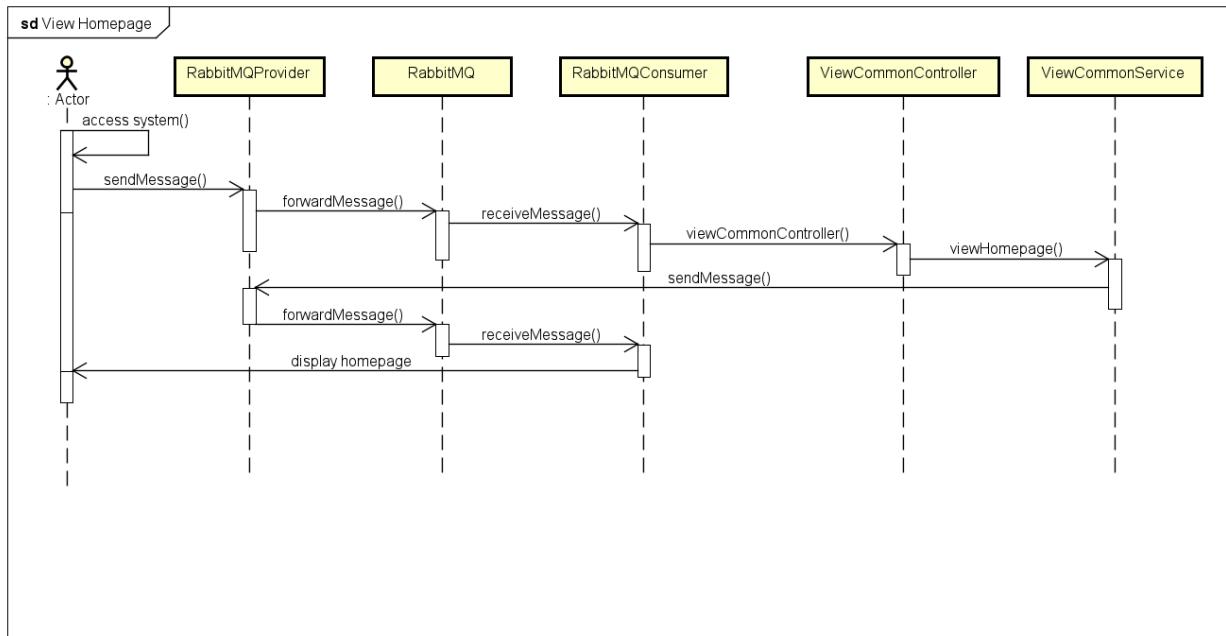


Figure 16. View Homepage sequence diagram.

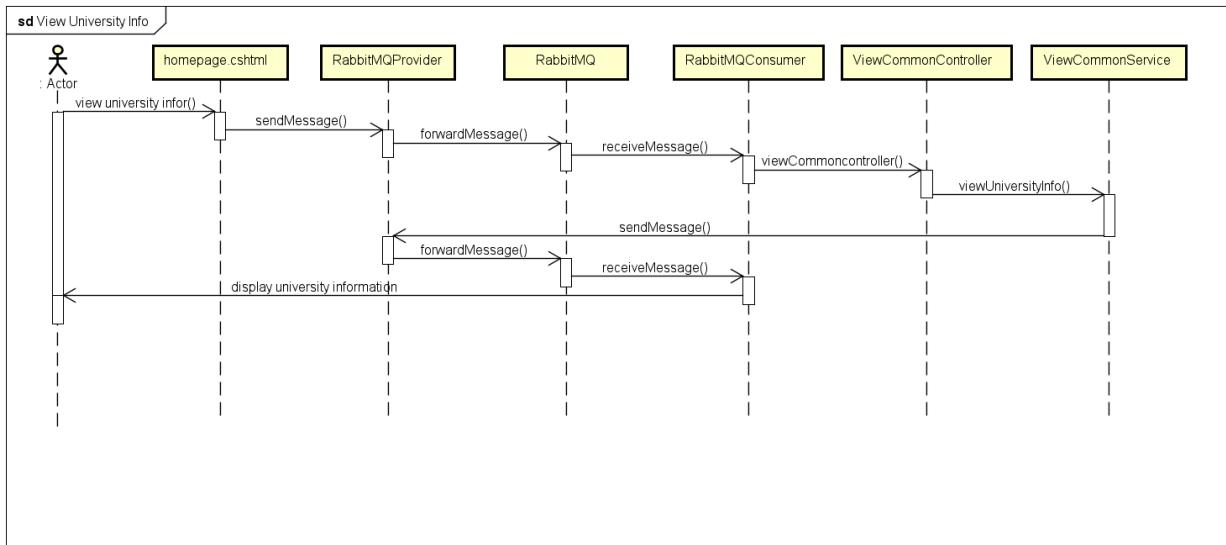


Figure 17. View University Information sequence diagram

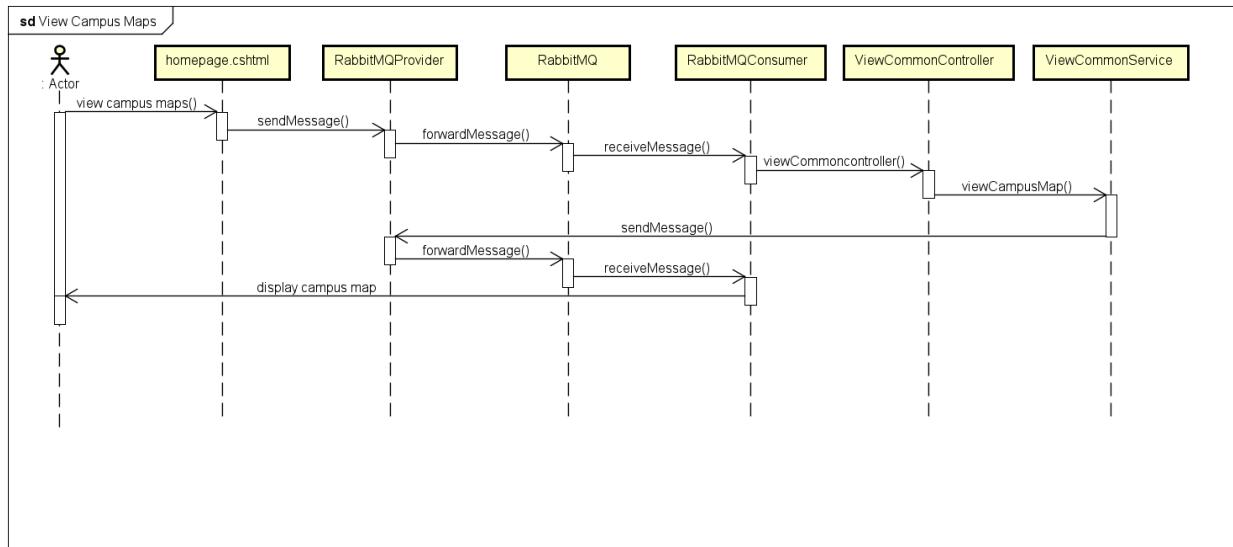


Figure 18. View Campus Map screen design.

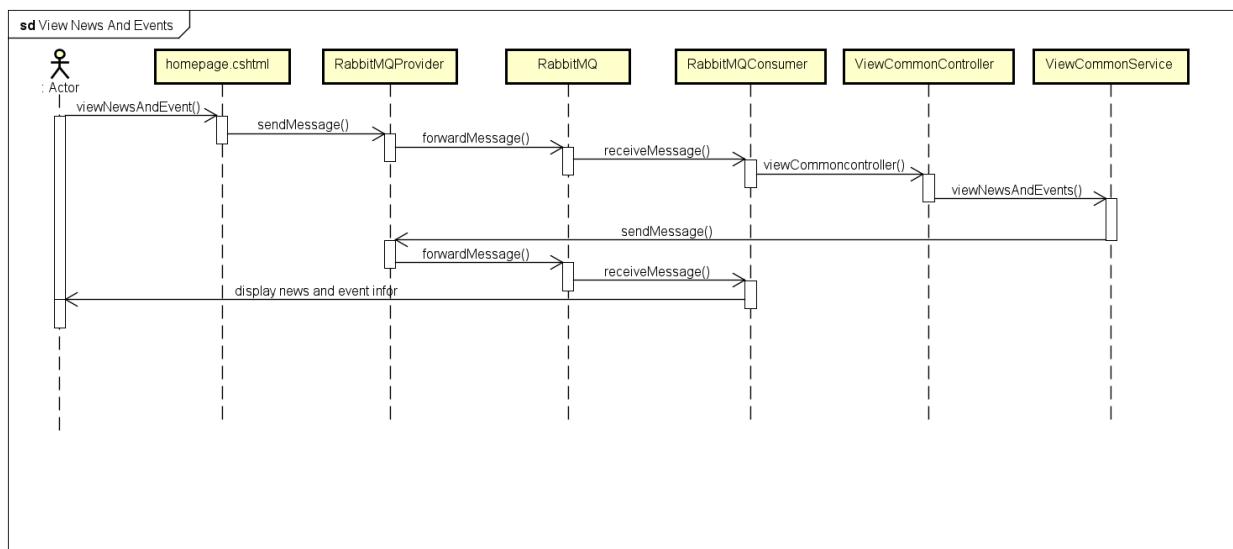


Figure 19. View News And Event screen design

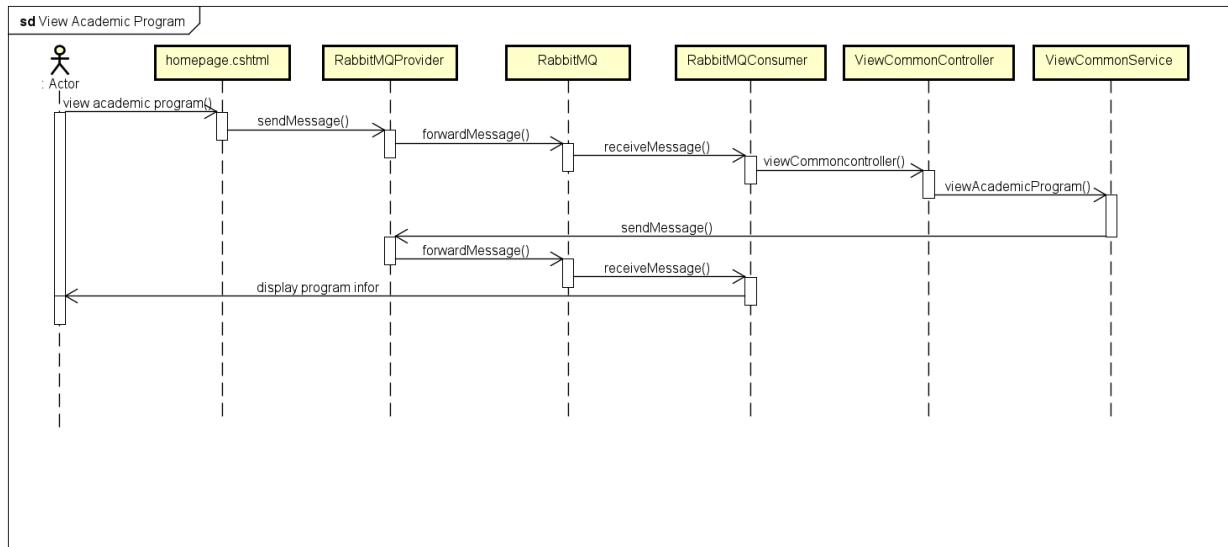


Figure 20. View Academic Program screen design

### 3.2. Account Management

#### 3.2.1. Class Diagram

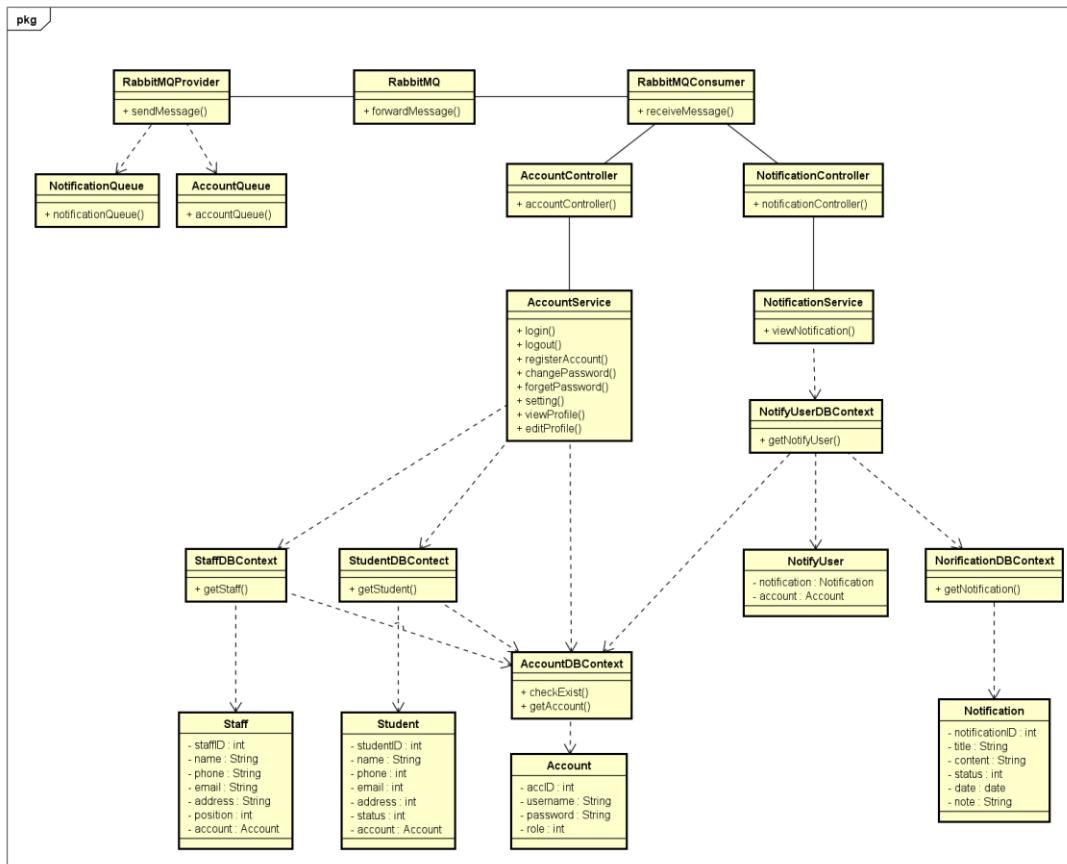
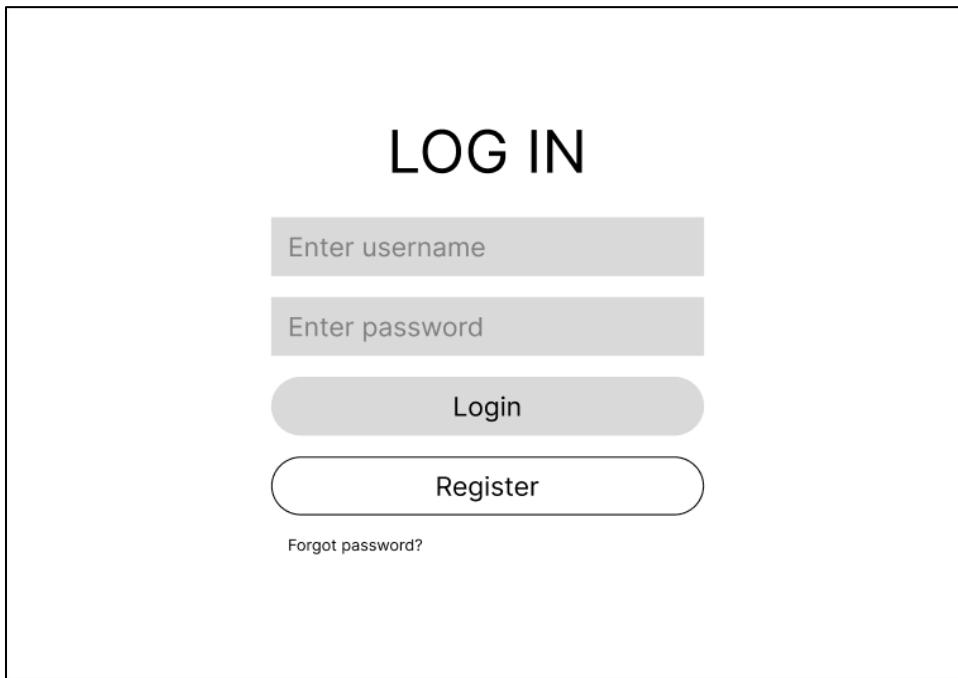


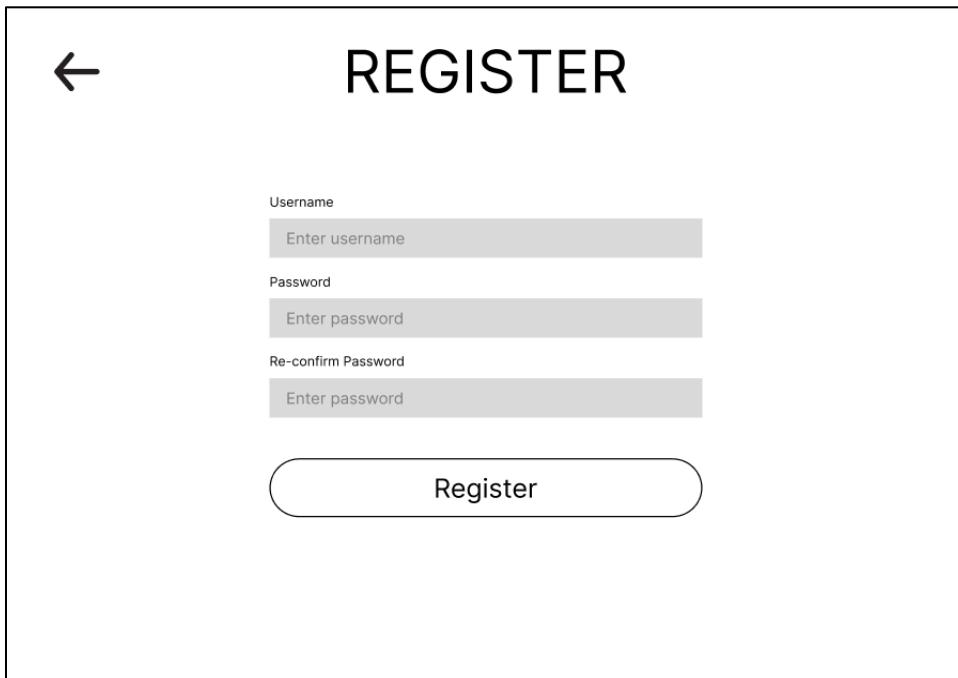
Figure 21. Account Management feature class diagram

### 3.2.3. Screen Design



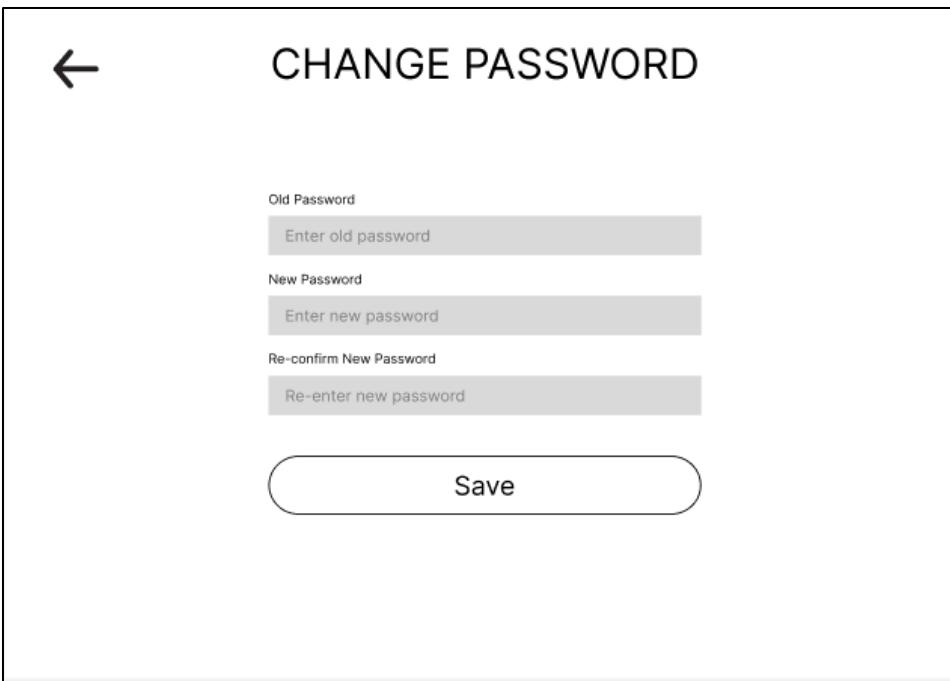
The login screen features a large "LOG IN" title at the top center. Below it are two input fields: "Enter username" and "Enter password". Underneath these are two rounded rectangular buttons: "Login" and "Register". At the bottom left, there is a link labeled "Forgot password?".

Figure 22. Login screen design



The register screen has a back arrow icon on the left and a large "REGISTER" title at the top center. It includes three input fields with labels: "Username", "Password", and "Re-confirm Password". Each field has a placeholder text "Enter [field type]". Below these is a single rounded rectangular "Register" button.

Figure 23. Register Account screen design



The image shows a 'CHANGE PASSWORD' screen. At the top left is a back arrow icon. The title 'CHANGE PASSWORD' is centered at the top. Below the title are three input fields: 'Old Password' (placeholder: 'Enter old password'), 'New Password' (placeholder: 'Enter new password'), and 'Re-confirm New Password' (placeholder: 'Re-enter new password'). A large, rounded rectangular button labeled 'Save' is positioned below the input fields.

Figure 24. Change Password screen design

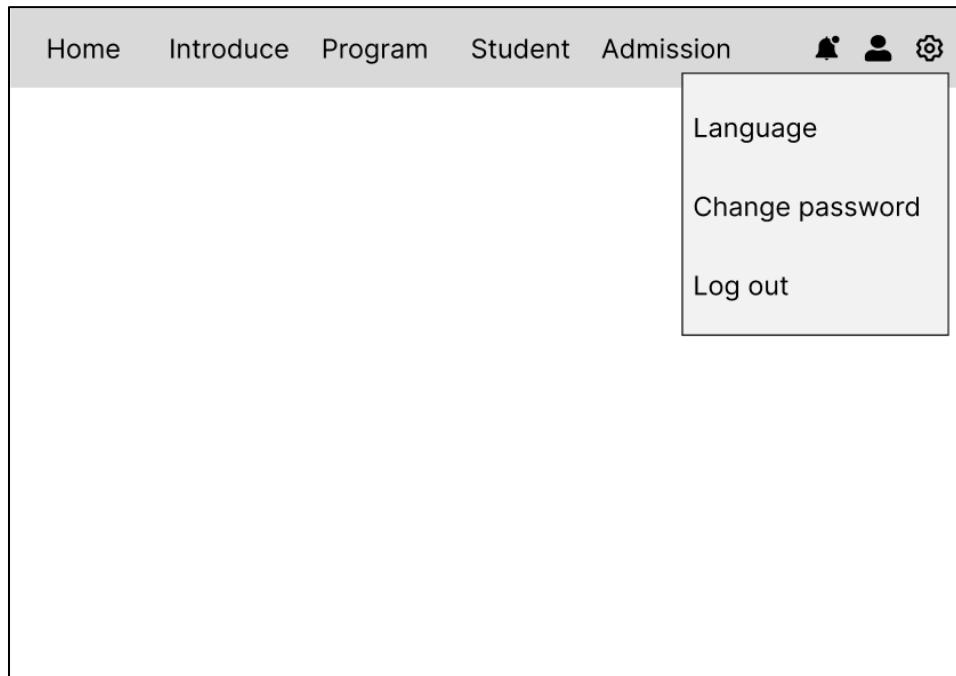


Figure 25. Setting screen design

Home Introduce Program Student Admission

Image

Full name: Nguyen Van A

Date of birth: 31-02-2005

Gender: Male

Phone: 0123456789

Email: nguyenvana@email.com

Address: Hoan Kiem, Ha Noi

School: THPT ABC

Save

Figure 26. Edit Profile screen design.

Home Introduce Program Student Admission

Image

Full name: Nguyen Van A

Date of birth: 31-02-2005

Gender: Male

Phone: 0123456789

Email: nguyenvana@email.com

Address: Hoan Kiem, Ha Noi

School: THPT ABC

Edit

Figure 27. View Profile screen design

### 3.2.4. Sequence Diagram

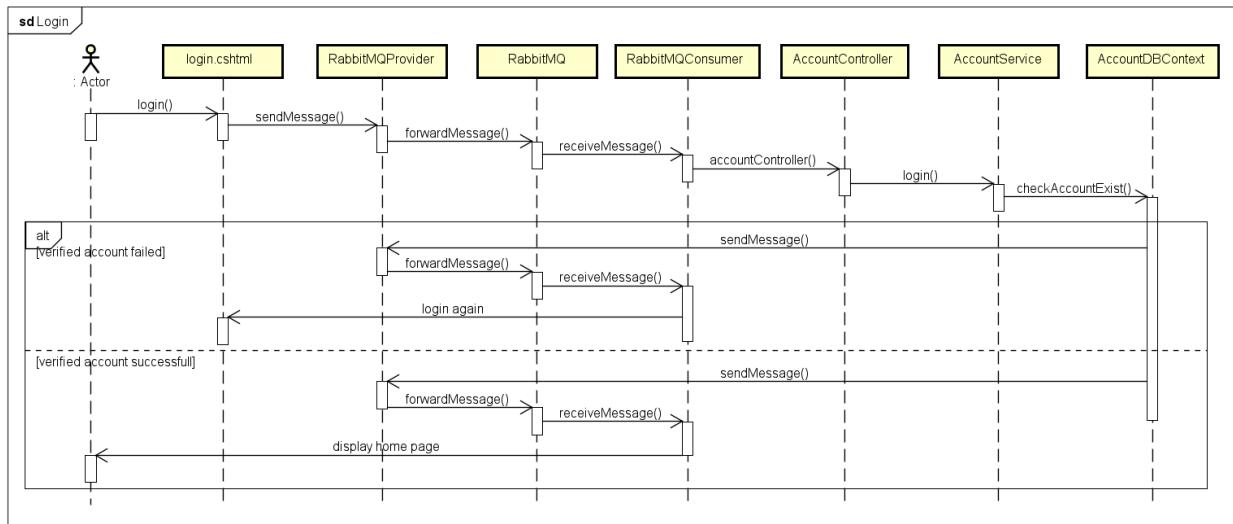


Figure 28. Login sequence diagram.

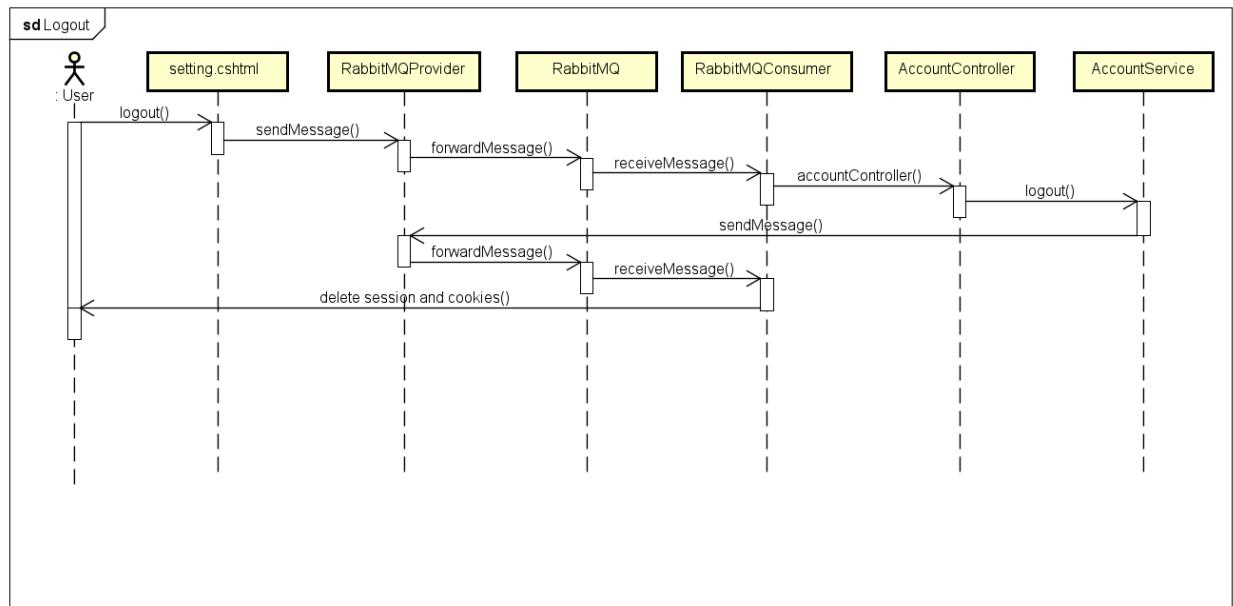


Figure 29. Logout sequence diagram.

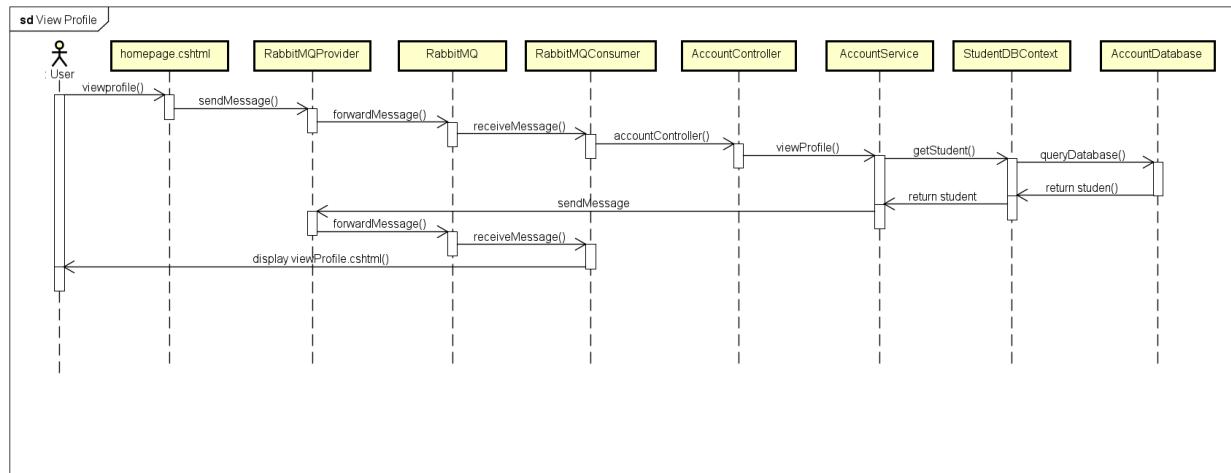


Figure 30. View profile sequence diagram.

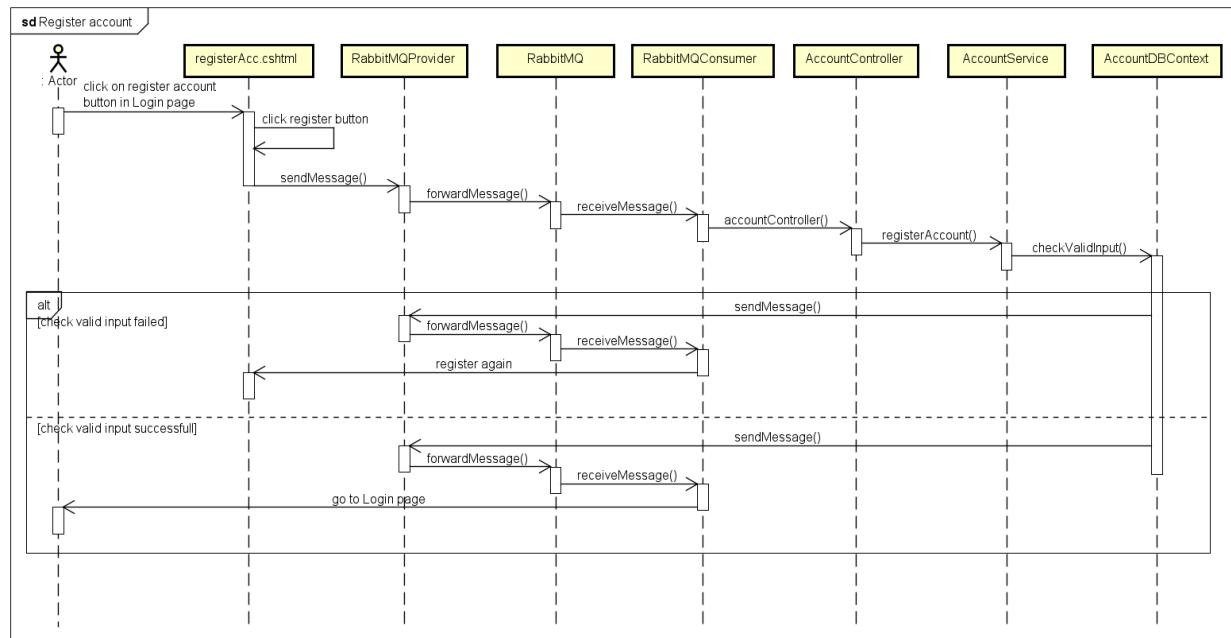


Figure 31. Register account sequence diagram.

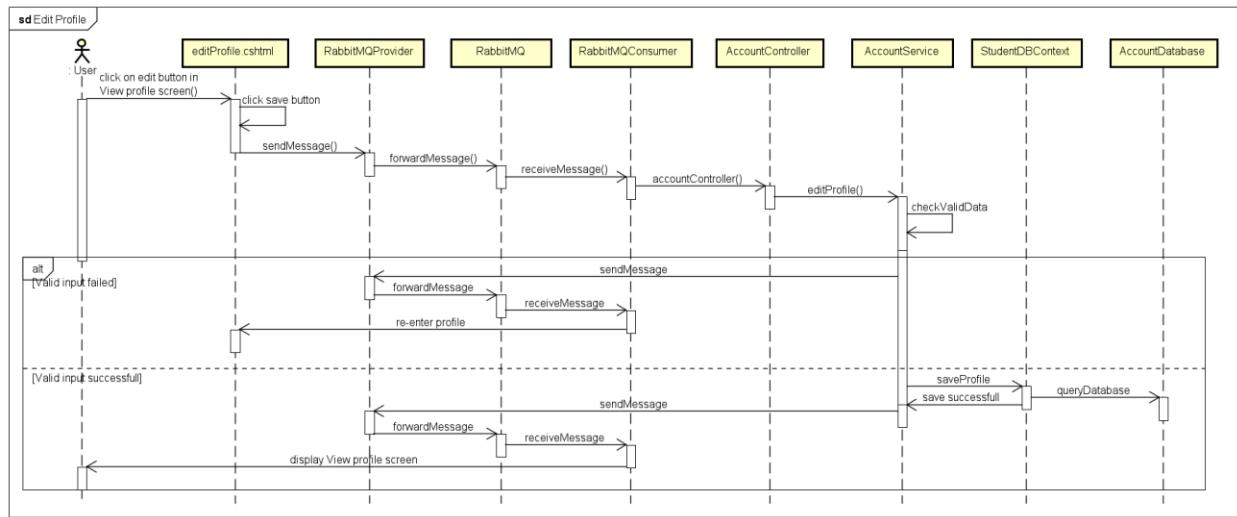


Figure 32. Edit profile sequence diagram.

### 3.3. Admission Management

#### 3.3.1. Class Diagram

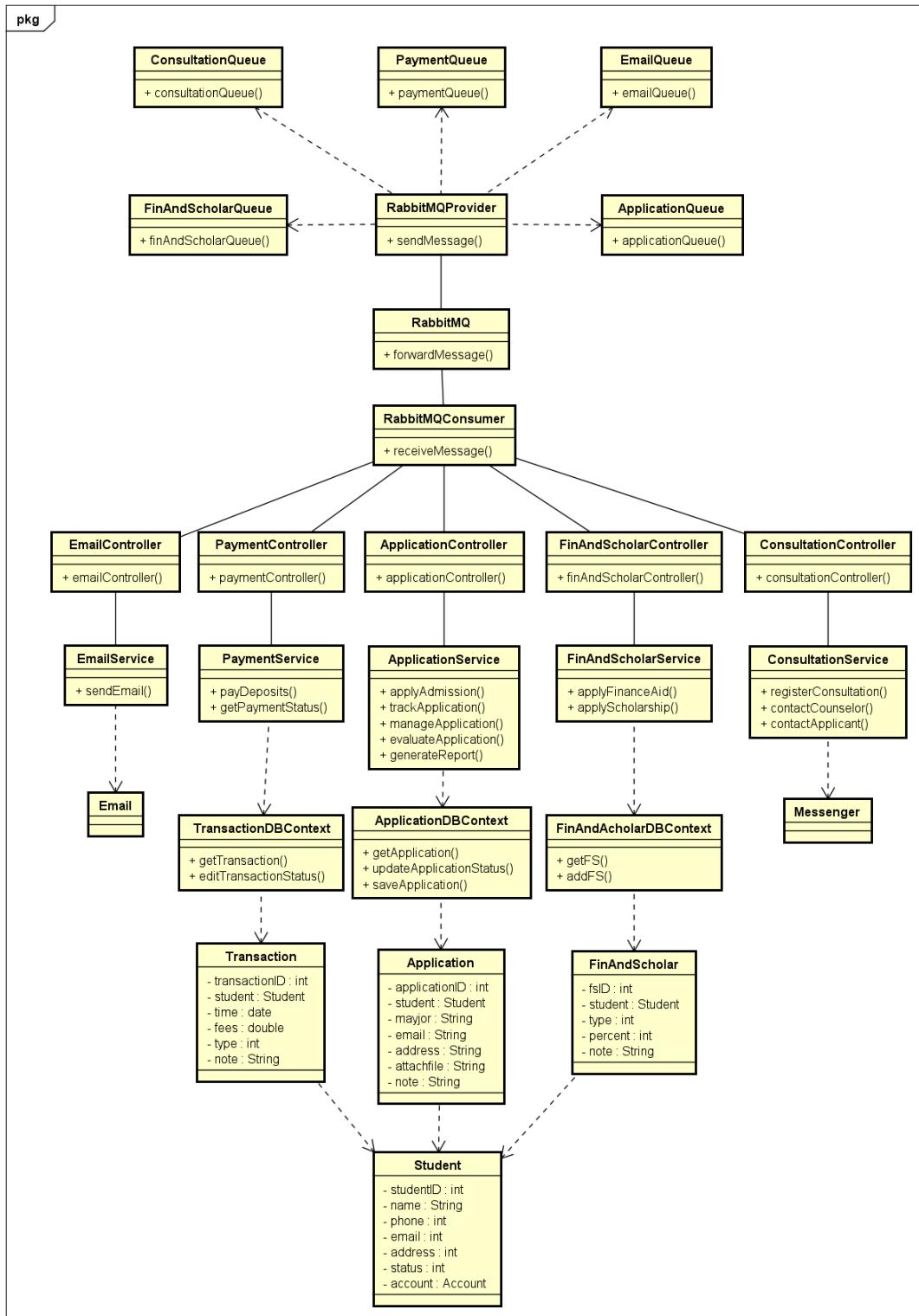


Figure 33. Admission feature class diagram.

### 3.3.3. Screen Design

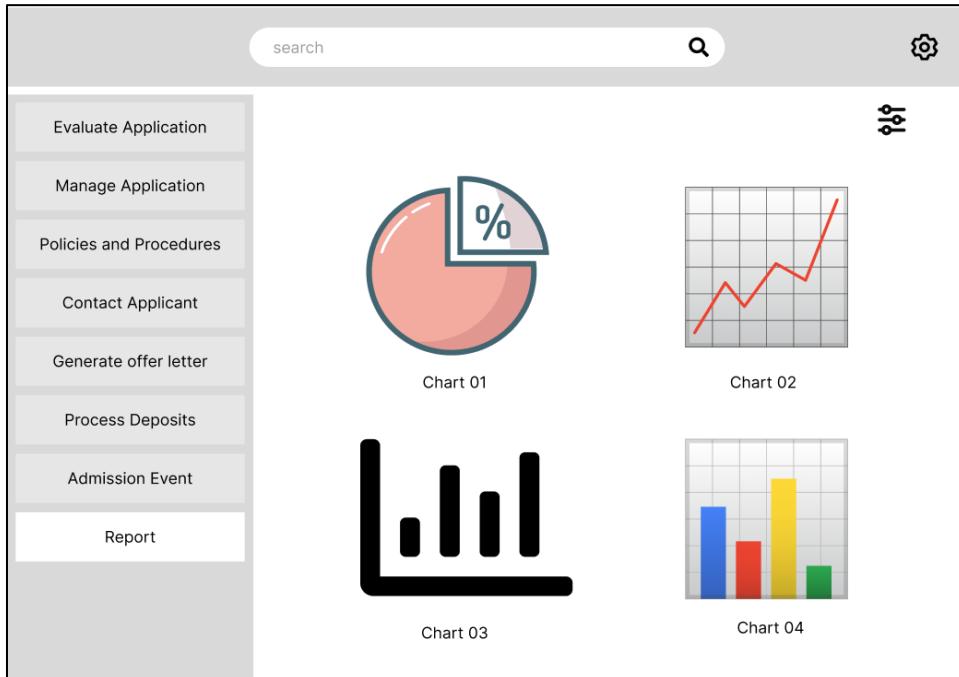


Figure 34. Admission report screen design.

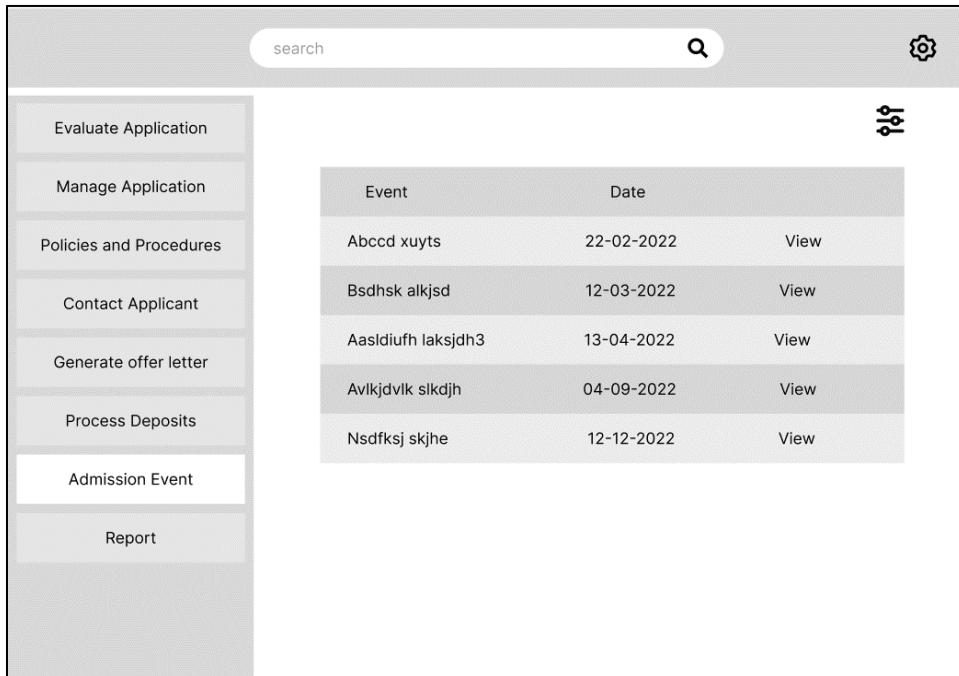


Figure 35. Manage Admission Even screen design.

search

Deposit ID:

DepositID	Date	Status	
D00001	22-02-2022	Checked	<a href="#">View</a>
D00002	12-03-2022	Checked	<a href="#">View</a>
D00003	13-04-2022	Checked	<a href="#">View</a>
D00004	04-09-2022	Uncheck	<a href="#">View</a>
D00005	12-12-2022	Uncheck	<a href="#">View</a>

Figure 36. Process deposits screen design.

search

Receiver list abc.xlsx

Send Cancel

This is email's content

Figure 37. Generate offer letter screen design.

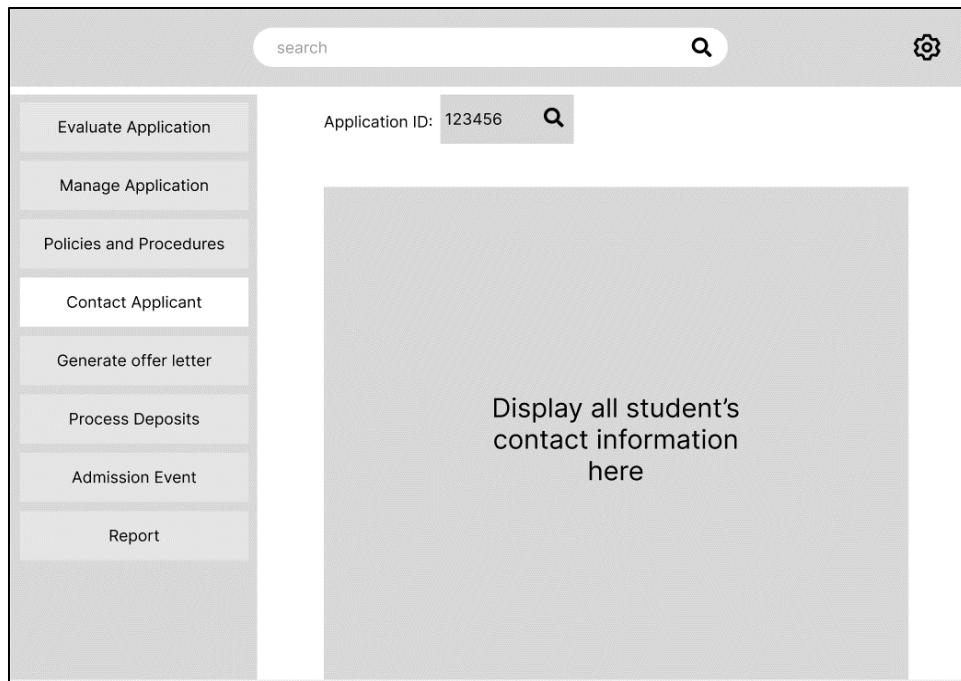


Figure 38. Contact Applicant screen design.

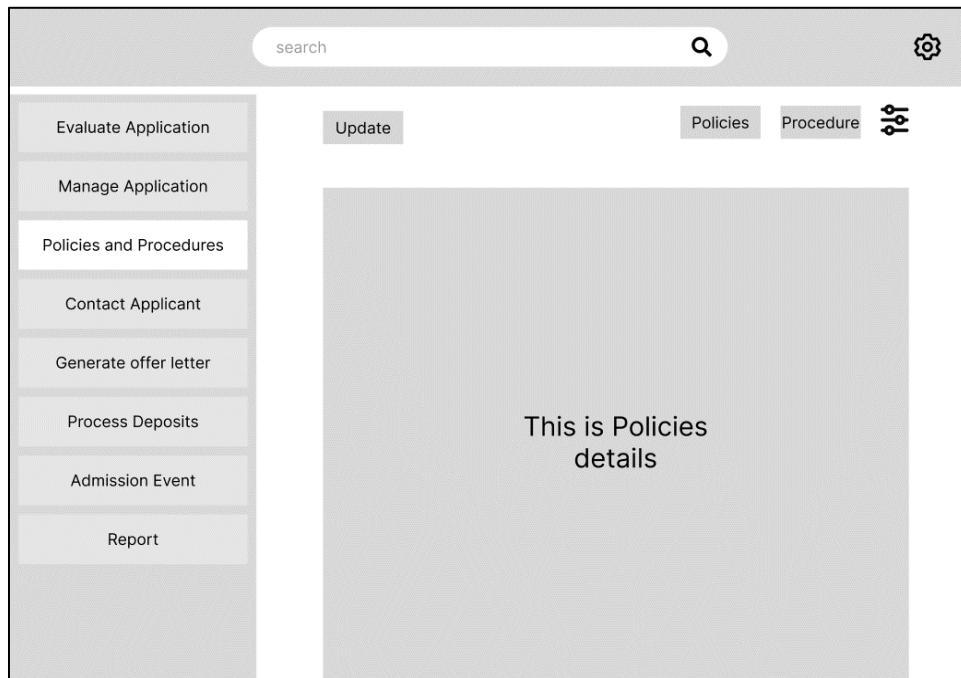


Figure 39. Manage Policies and Procedure screen design.

The screenshot shows a user interface for managing applications. On the left is a vertical sidebar with the following menu items:

- Evaluate Application
- Manage Application
- Policies and Procedures
- Contact Applicant
- Generate offer letter
- Process Deposits
- Admission Event
- Report

The main area has a header with a search bar, a magnifying glass icon, and a gear icon. Below the header is a table titled "Application ID:" with a search bar and a filter icon. The table displays the following data:

Name	Date	Status	Action
Abccd xuyts	22-02-2022	Accept	View
Bsdhsk alkjsd	12-03-2022	Reject	View
Aasdiufh laksjdh3	13-04-2022	Accept	View
Avlkjdvlk slkdjh	04-09-2022	Uncheck	View
Nsdfksj skjhe	12-12-2022	Uncheck	View

Figure 40. Manage Application screen design.

The screenshot shows a user interface for evaluating an application. On the left is a vertical sidebar with the following menu items:

- Evaluate Application
- Manage Application
- Policies and Procedures
- Contact Applicant
- Generate offer letter
- Process Deposits
- Admission Event
- Report

The main area has a header with a search bar, a magnifying glass icon, and a gear icon. Below the header is a table titled "Application ID:" with a search bar and a filter icon. The table displays the following data:

123456	<input type="button" value="Accept"/>	<input type="button" value="Reject"/>	<input type="button" value="More Options"/>
--------	---------------------------------------	---------------------------------------	---

In the center of the main area, there is a large gray box containing the text "This is application details".

Figure 41. Evaluate Application screen design.

Figure 42. Apply Admission screen design.

### 3.3.4. Sequence Diagram

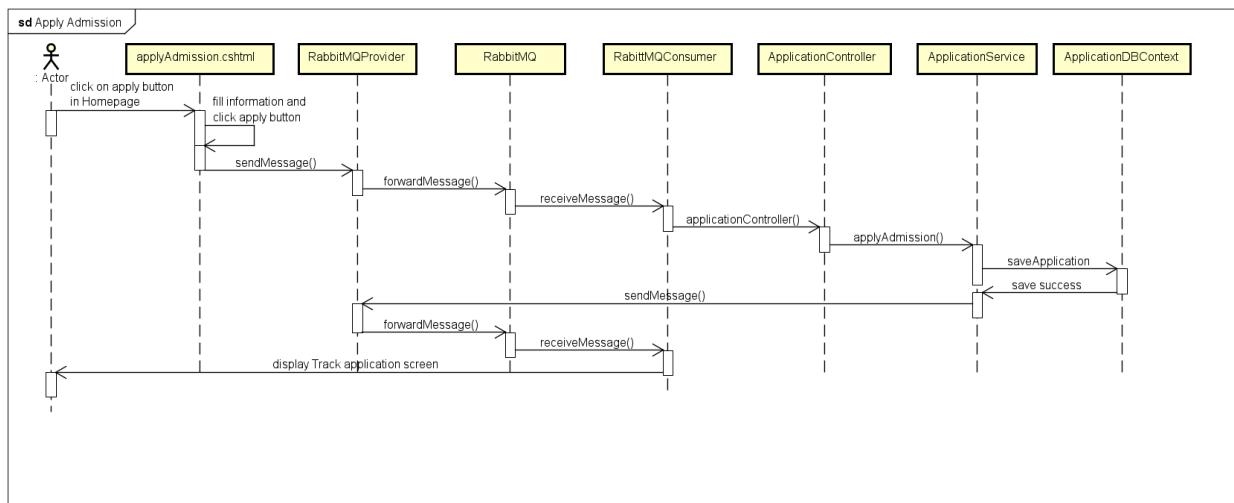


Figure 43. Apply Admission sequence diagram.

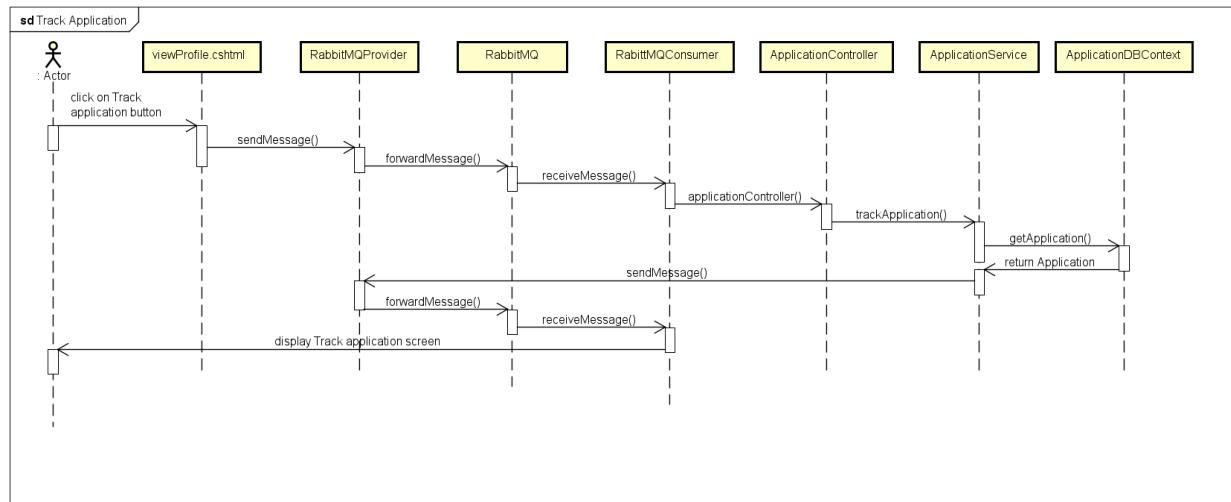


Figure 44. Track application sequence diagram.

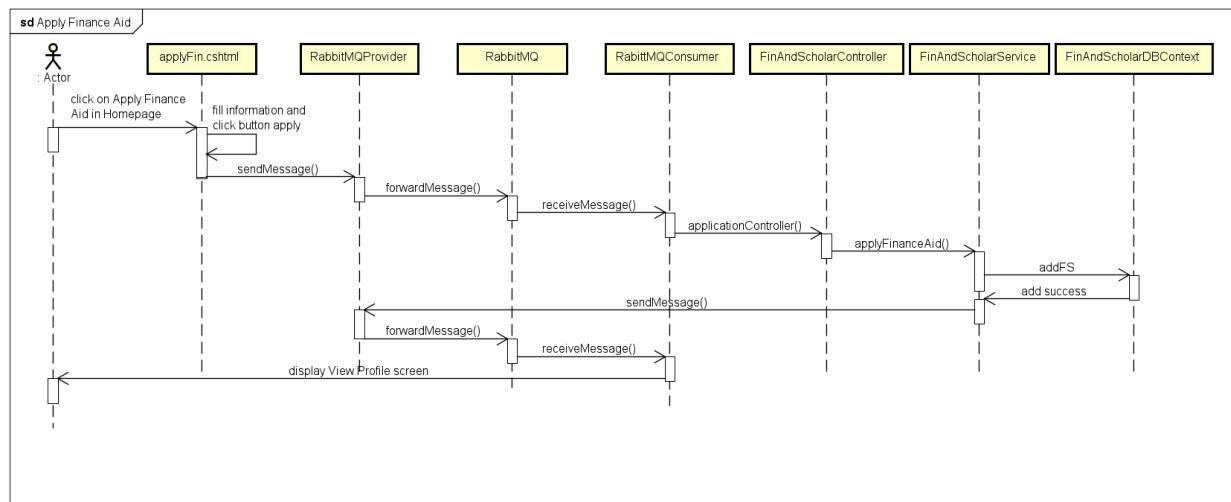


Figure 45. Apply Finance Aid sequence diagram.

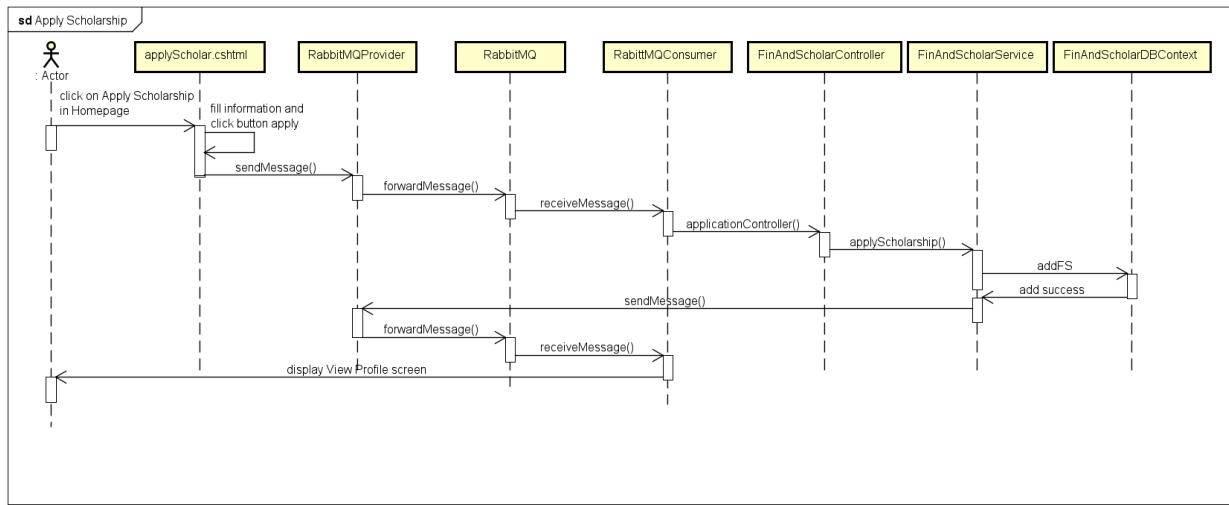


Figure 46. Apply Scholarship sequence diagram.

## 3.4. Examination

### 3.4.1. Class Diagram

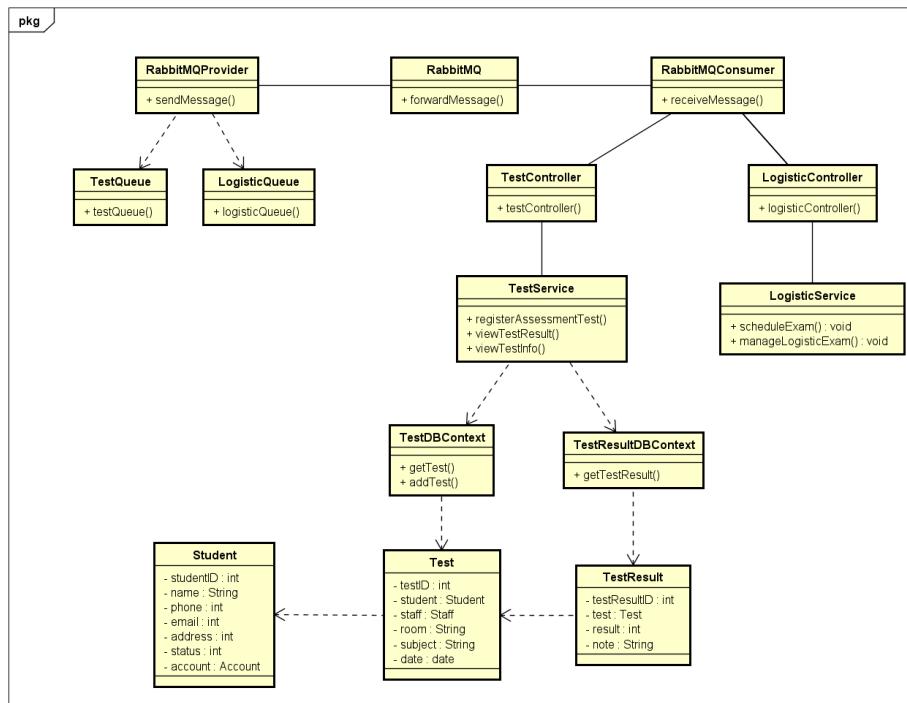


Figure 47. Examination feature class diagram.

### 3.4.3. Screen Design

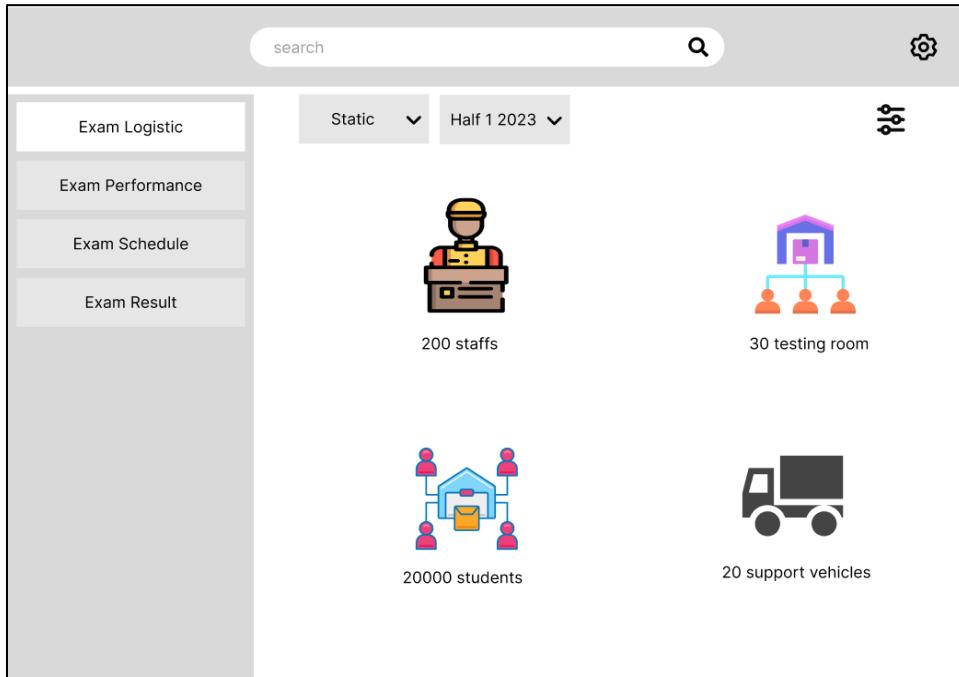


Figure 48. Logistic Examination screen design.

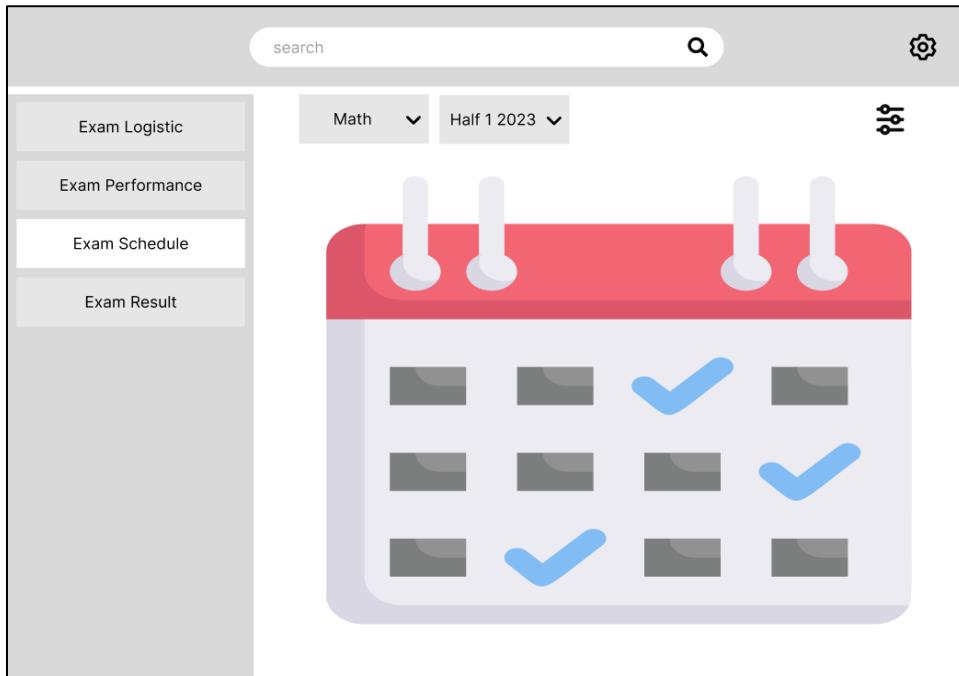


Figure 49. Exam Schedule screen design.

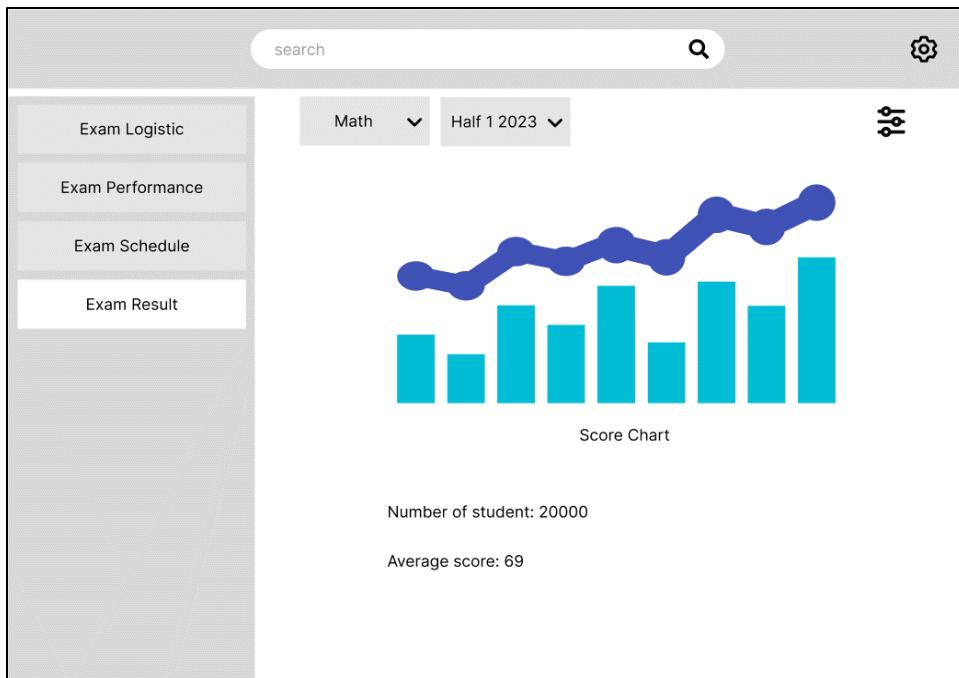


Figure 50. Exam Result screen design.

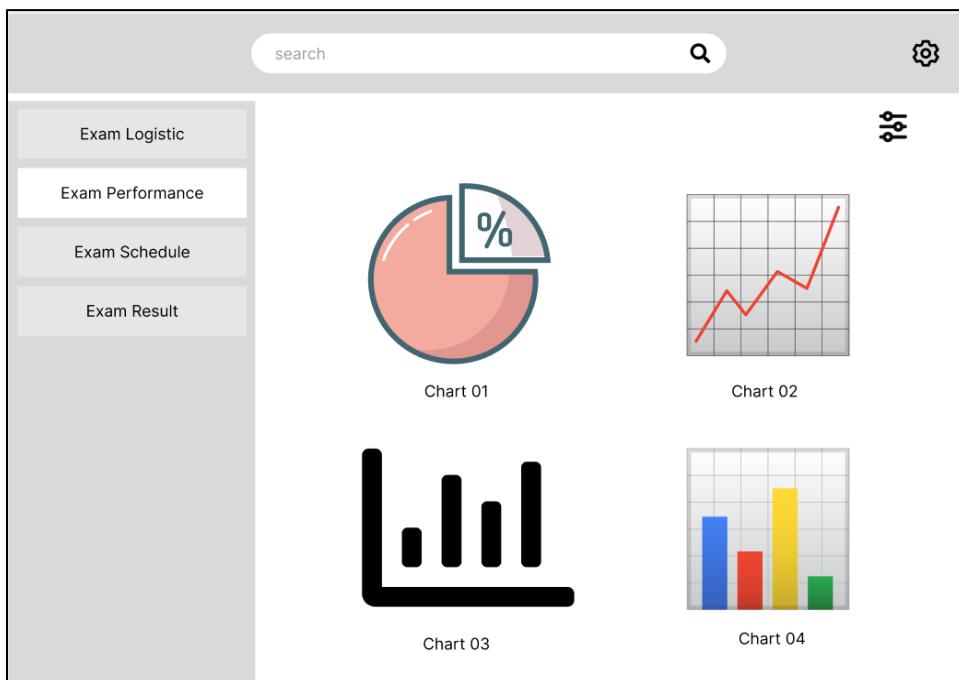


Figure 51. Monitor Exam Performance screen design.

### 3.4.4. Sequence Diagram

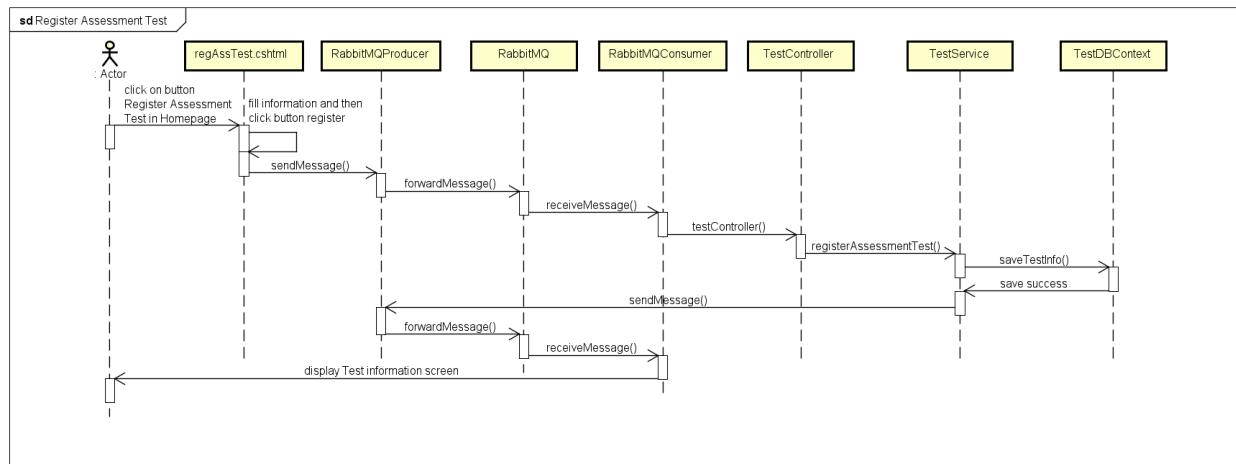


Figure 52. Register Assessment Test sequence diagram.

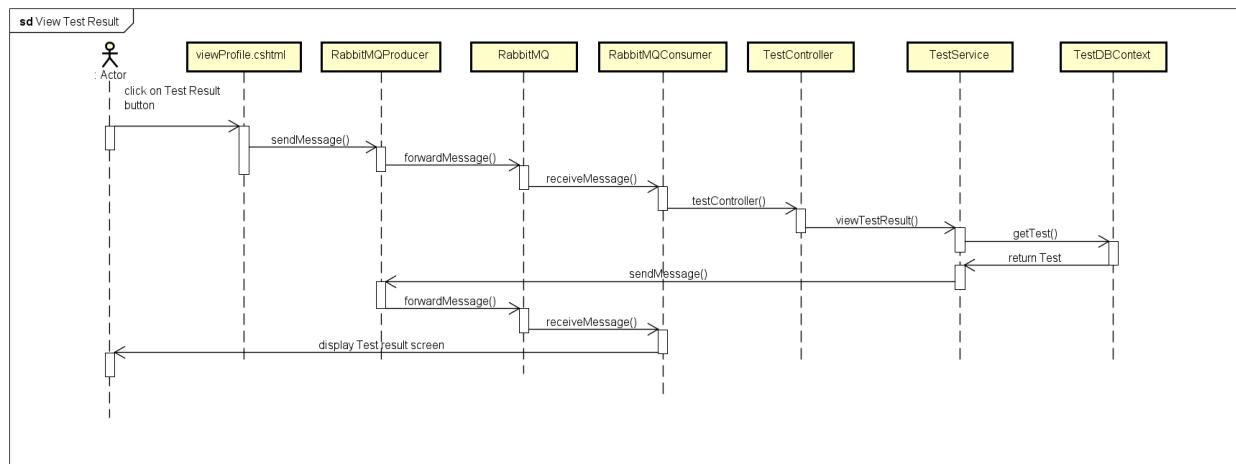


Figure 53. View Test Result sequence diagram.

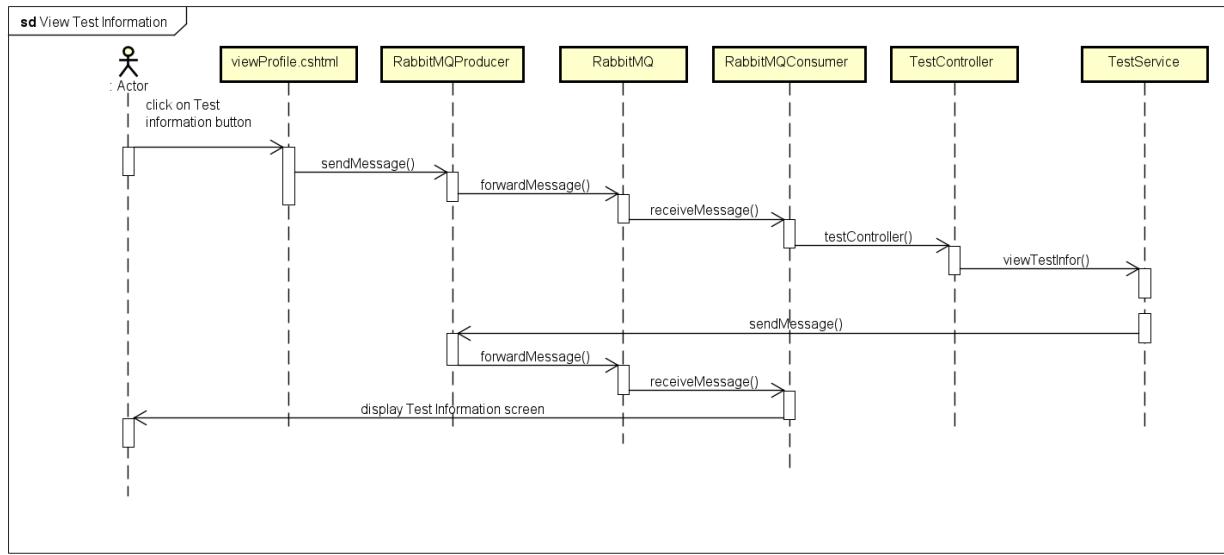


Figure 54. View Test Information sequence diagram.

## 3.5. Marketing

### 3.5.1. Class Diagram

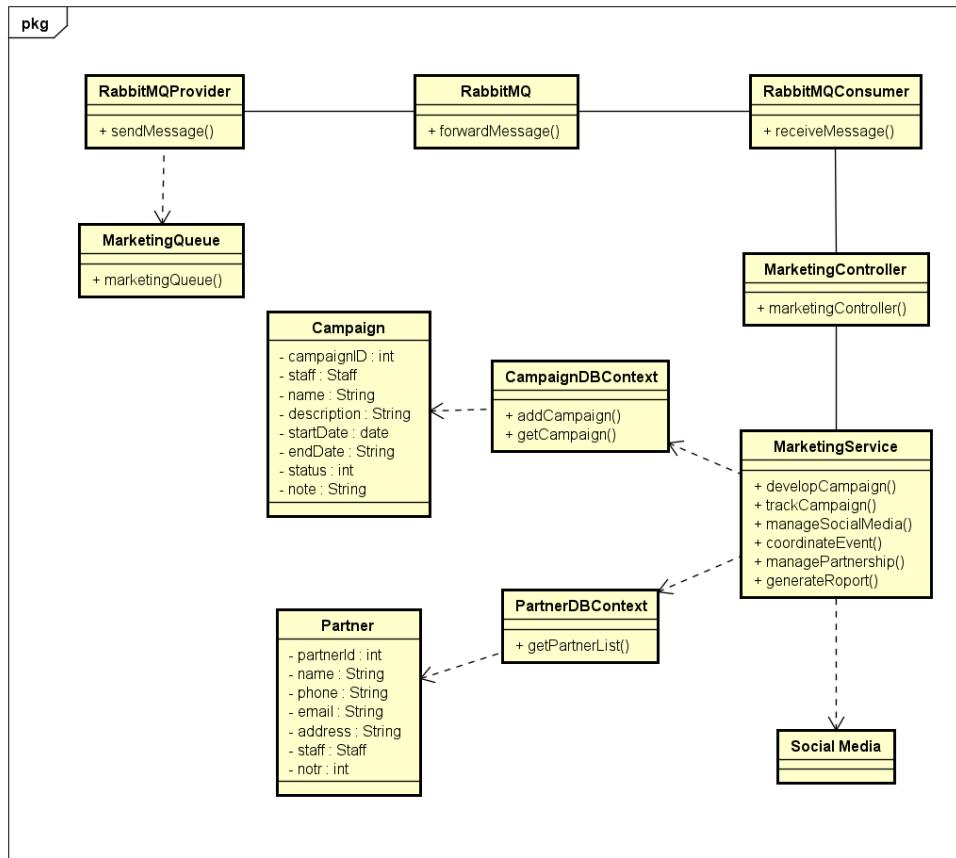


Figure 55. Marketing feature class diagram.

### 3.5.3. Screen Design

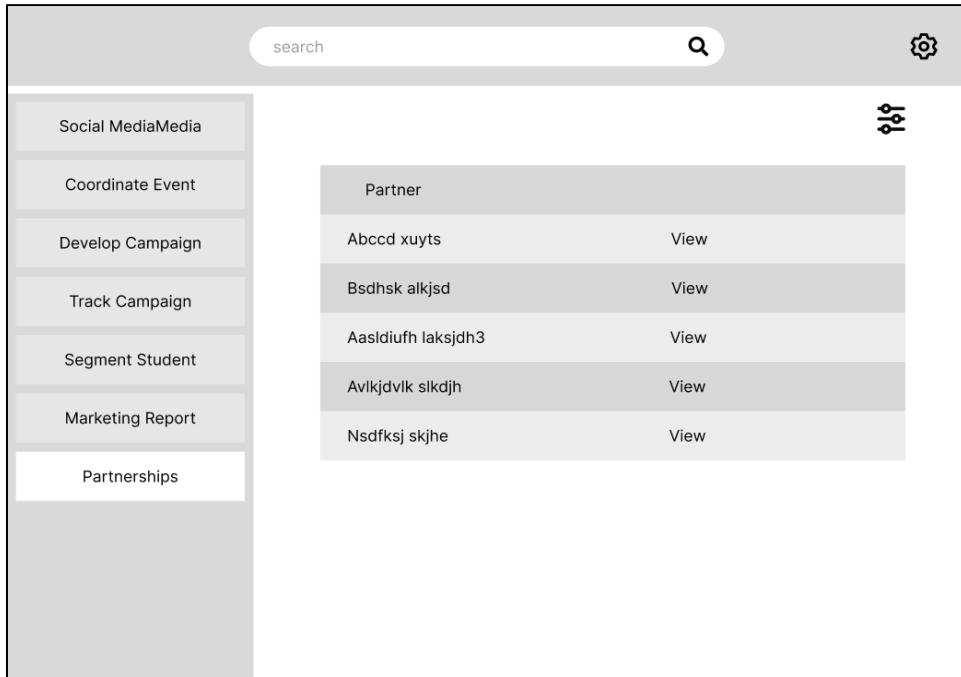


Figure 56. Manage Partnership screen design.

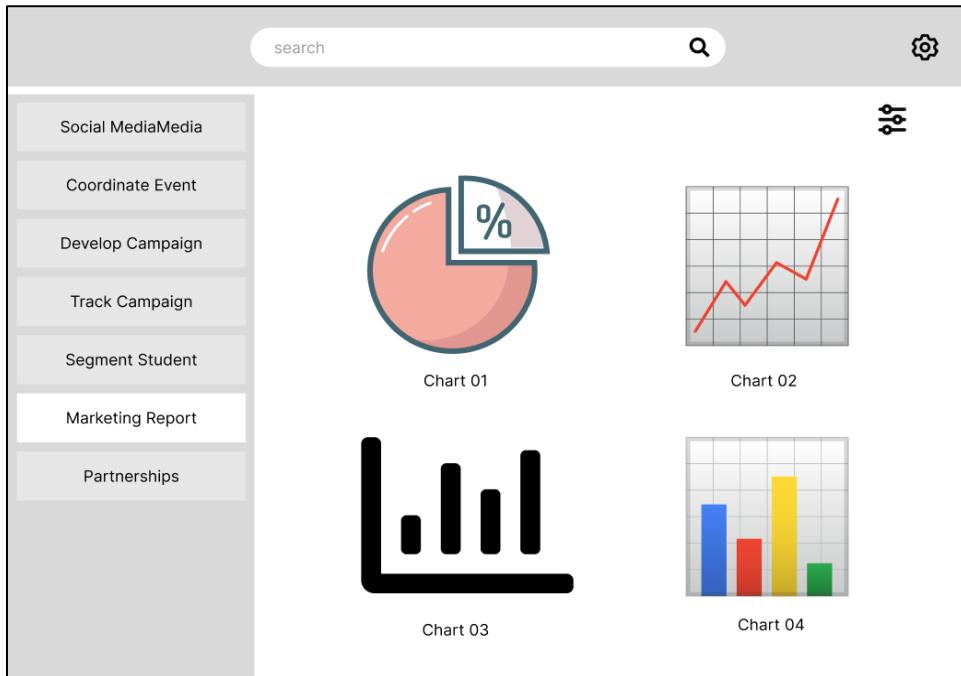


Figure 57. Generate Marketing Report screen design.

The screenshot shows a mobile application interface for segmenting prospective students. At the top right are a search bar, a magnifying glass icon, and a gear icon. On the left is a vertical navigation menu with options: Social Media, Coordinate Event, Develop Campaign, Track Campaign (which is selected), Segment Student, Marketing Report, and Partnerships. The main content area displays a table with columns: Student, Type 1, Type 2, and Type 3. The data rows are as follows:

Student	Type 1	Type 2	Type 3
Abccd xuyts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bsdhsk alkjsd	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aasldiufh laksjdh3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Avlkjdvlk slkdjh	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nsdfksj skjhe	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bsdhsk alkjsd	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aasldiufh laksjdh3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Avlkjdvlk slkdjh	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nsdfksj skjhe	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 58. Segment Prospective Student screen design.

The screenshot shows a mobile application interface for tracking campaign progress. At the top right are a search bar, a magnifying glass icon, and a gear icon. On the left is a vertical navigation menu with options: Social Media, Coordinate Event, Develop Campaign, Track Campaign (which is selected), Segment Student, Marketing Report, and Partnerships. The main content area displays a table with columns: Campaign and Progress. The data rows are as follows:

Campaign	Progress	
Abccd xuyts	45%	<a href="#">View</a>
Bsdhsk alkjsd	97%	<a href="#">View</a>
Aasldiufh laksjdh3	100%	<a href="#">View</a>

Figure 59. Track Campaign screen design.

search

name

Start date

End date

Target

Social network

PIC

Description

Name	Abcd
Start date	12-02-2022
End date	01-01-2023
Target	100000 reaches
Social network	Facebook
PIC	Abcd
Description	Adkfhsk alksjdhf laskjdhflks

Figure 60. Develop Campaign screen design.

search

Event

Date

View

Event	Date	View
Abccd xuyts	22-02-2022	View
Bsdhsk alkjdsd	12-03-2022	View
Aasldiufh laksjdh3	13-04-2022	View
Avlkjdvlik slkdjh	04-09-2022	View
Nsdfksj skjhe	12-12-2022	View

Figure 61. Coordinate Event screen design.

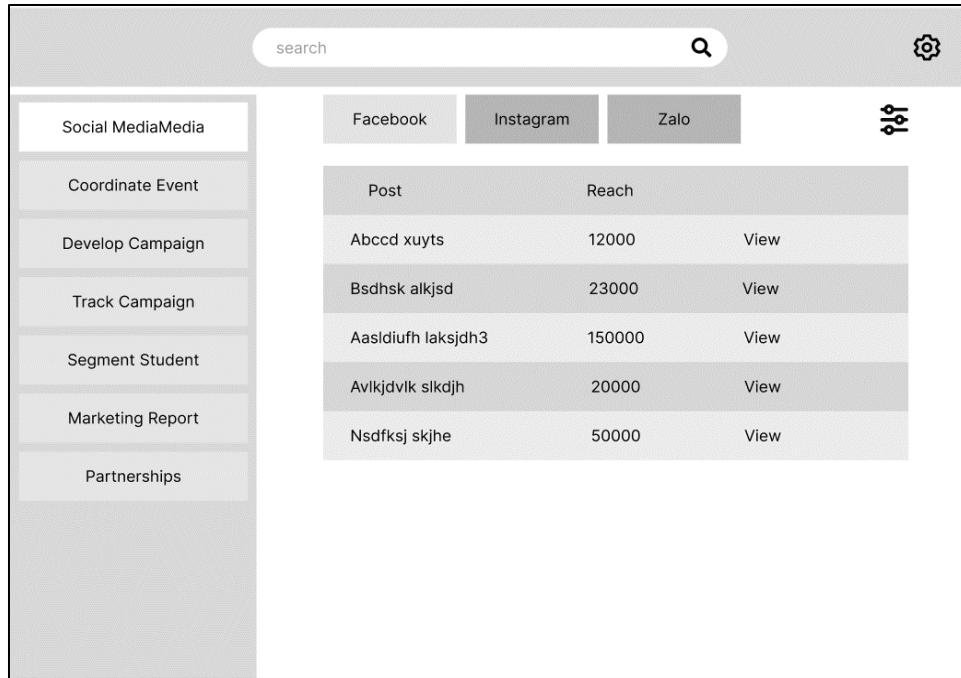


Figure 62. Manage Social Media screen design.

#### 3.5.4. Sequence Diagram

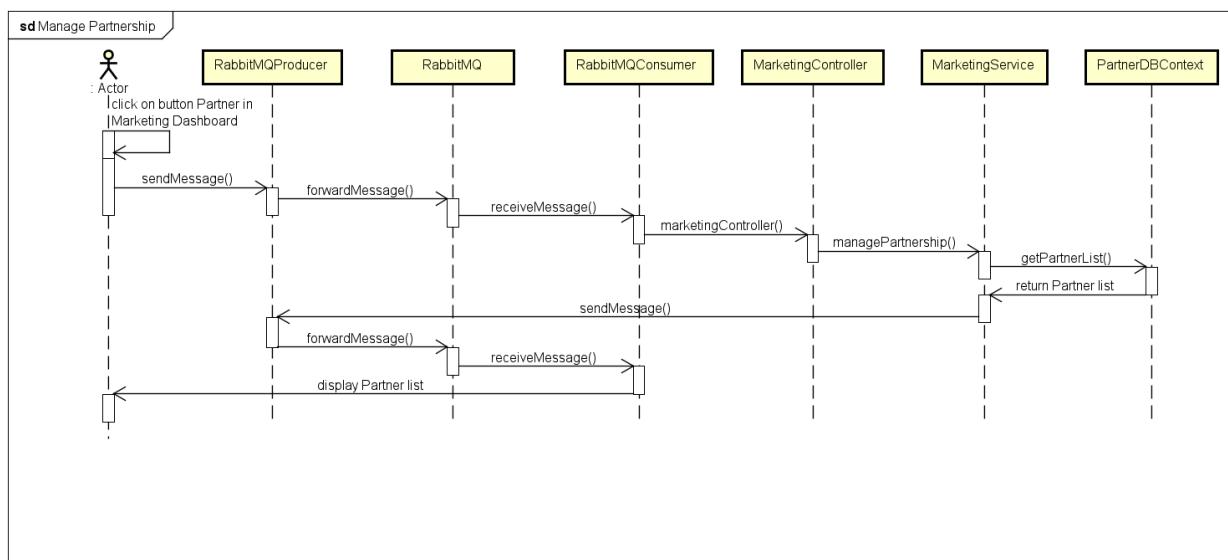


Figure 63. Manage Partnership sequence diagram.

## 3.6. Admin Management

### 3.6.1. Class Diagram

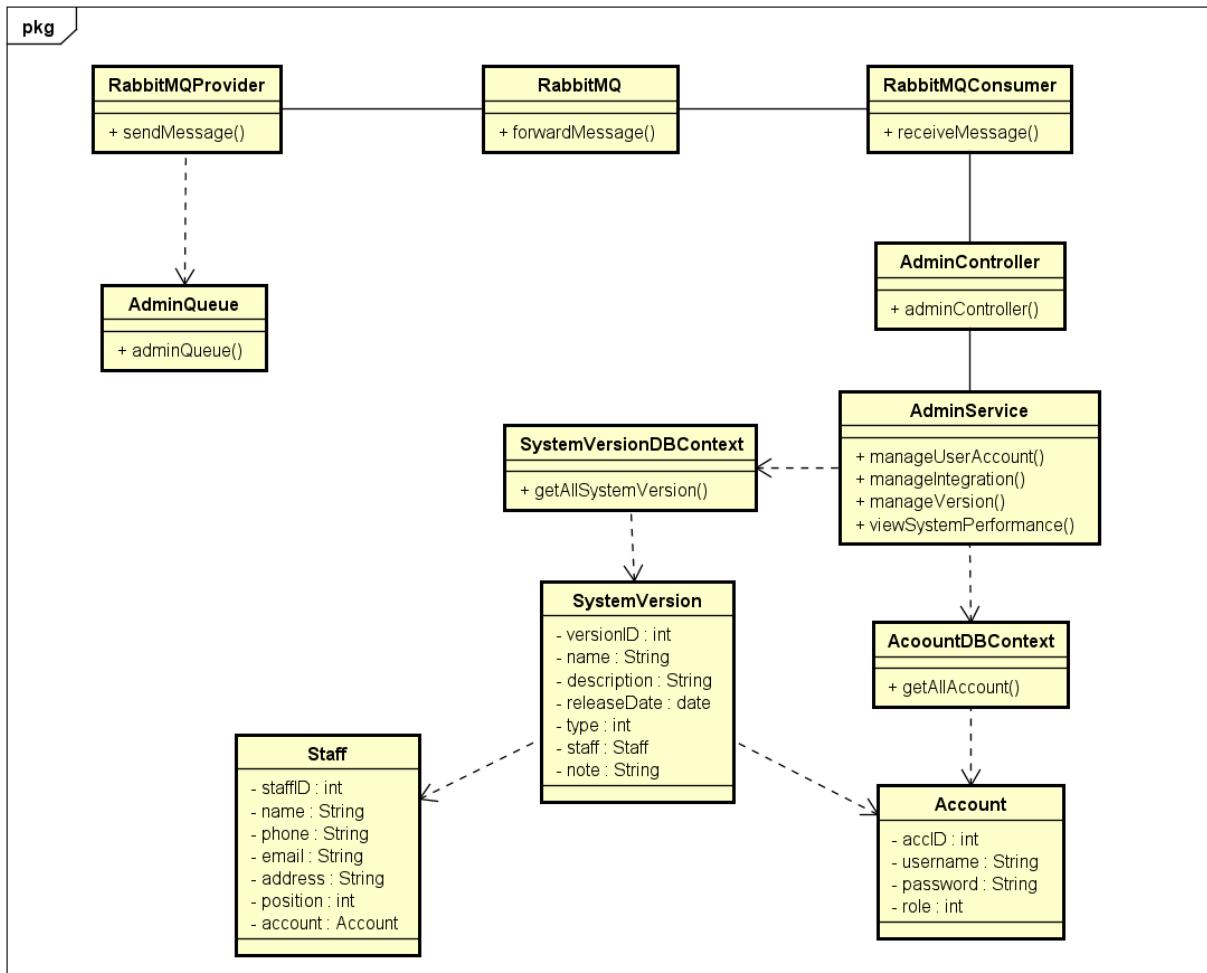


Figure 64.Admin Management feature class diagram.

### 3.6.3. Screen Design

The screenshot shows a mobile application interface for managing integrations. At the top is a navigation bar with a search field and a gear icon. On the left is a vertical sidebar with tabs: 'Manage Integrations' (selected), 'System Performance', 'Upgrades and Updates', and 'User Account'. The main content area is titled 'Connected System' and contains a table with five rows:

Name	Version	Action
Messenger	v2.1	<a href="#">View</a>
Online Payment	v2.1	<a href="#">View</a>
System03	v2.1	<a href="#">View</a>
System04	v2.1	<a href="#">View</a>
System05	v2.1	<a href="#">View</a>

Figure 65. Manage Integration screen design.

The screenshot shows a mobile application interface for monitoring system performance. At the top is a navigation bar with a search field and a gear icon. On the left is a vertical sidebar with tabs: 'Manage Integrations' (selected), 'System Performance', 'Upgrades and Updates', and 'User Account'. The main content area displays four charts labeled 'Chart 01' through 'Chart 04':

- Chart 01: A pie chart showing a large red slice and a smaller blue slice with a percentage symbol.
- Chart 02: A line graph showing a red line with several peaks and troughs over time.
- Chart 03: A bar chart showing four black bars of varying heights.
- Chart 04: A bar chart showing four colored bars (blue, red, yellow, green) of varying heights.

Figure 66. Monitor System Performance screen design.

The screenshot shows a user interface for managing updates. On the left is a vertical sidebar with menu items: Manage Integrations, System Performance, Upgrades and Updates (which is selected and highlighted in blue), and User Account. At the top right are three icons: a magnifying glass for search, a gear for settings, and a grid for filters. Below the sidebar is a table with the following data:

Name	Date	Version	Action
Upgrade01	22-02-2022	v2.1	<a href="#">View</a>
Upgrade02	22-02-2022	v2.1	<a href="#">View</a>
Upgrade03	22-02-2022	v2.1	<a href="#">View</a>
Upgrade04	22-02-2022	v2.1	<a href="#">View</a>
Upgrade05	22-02-2022	v2.1	<a href="#">View</a>
Upgrade06	22-02-2022	v2.1	<a href="#">View</a>
Upgrade07	22-02-2022	v2.1	<a href="#">View</a>
Upgrade08	22-02-2022	v2.1	<a href="#">View</a>
Upgrade09	22-02-2022	v2.1	<a href="#">View</a>

Figure 67. Manage Updates and Upgrades screen design.

The screenshot shows a user interface for managing user accounts. On the left is a vertical sidebar with menu items: Manage Integrations, System Performance, Upgrades and Updates (selected and highlighted in blue), and User Account. At the top right are three icons: a magnifying glass for search, a gear for settings, and a grid for filters. Below the sidebar is a table with the following data:

User Type	User ID
Staff	User01
Student	User02
Staff	User03
Student	User04
Staff	User05
Student	User06
Staff	User07
Student	User08
Staff	User09
Student	User10

Figure 68. Manage User Account screen design.

### 3.6.4. Sequence Diagram

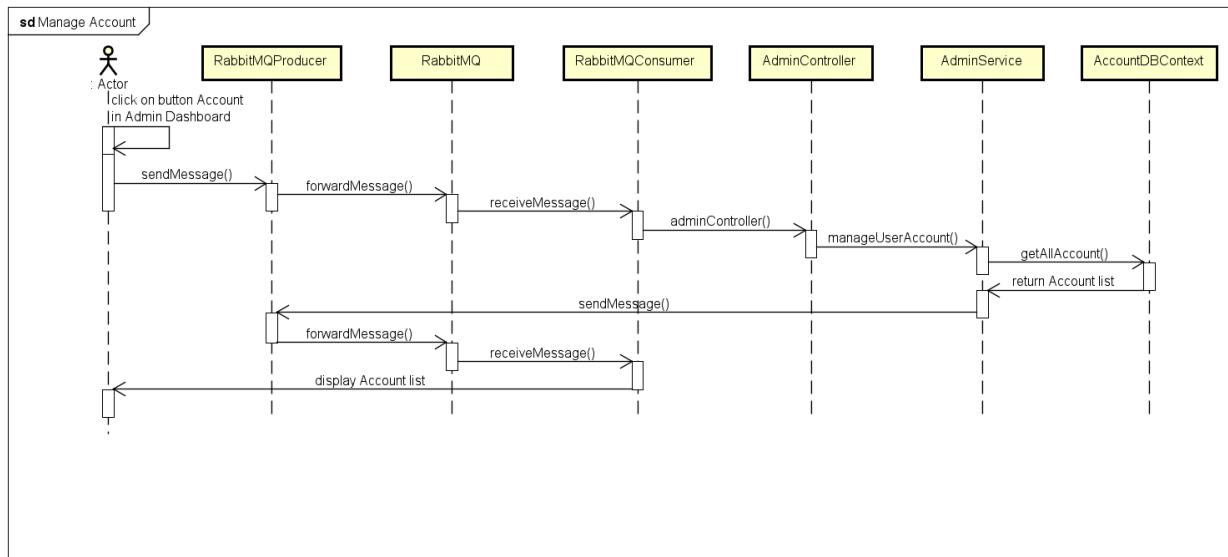


Figure 69. Manage Account sequence diagram.