SESSION 2020/2021, SEMESTER 2

SECJ 2203: SOFTWARE ENGINEERING

ALTERNATIVE ASSESSMENT:

MID-TERM ASSIGNMENT INDIVIDUAL REPORT

PART 2

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Section A: Introduction and Software Process Model

A.1　　Proposed Software System or Application

My proposed system is an interactive transaction-based software named as UTM MyReturn. It is web based applications where users can access by identifying themselves using username and password authorize by the system.

This proposed system is designed to meet the needs of the stakeholders where the system need to be able to apply and check the application, health declaration and isolation status whether completed, ongoing or have not start the isolation period. It also involves the academic advisors, Students Affair Department (HEP) and Residential College Offices (RCOs) of the university.

The approach of this system is by seeing through existing or similar system such as MySejahtera and UTM Smart. The ideas extracted from these system will be implemented in this proposed system.

The benefit of this system is that it is systematic and convenient to those who need it. The university does not need to directly be in touch with every single students to inform the rules and regulations to return back and their update as well. Instead they can just check it themselves using their smartphone. It is indeed provides real life status to the users.

Lastly, referring to other system such as UTM Smart, it has a lot of features in the system. It has the health declaration and students movement which similar to the return-back feature as shown in Figure 1 and 2. however, the system does not provide the isolation status and the approval letters to cross-state is not provided in it. Another source reference is MySejahtera, an application used by Malaysian to check the update regarding Covid-19 as shown Figure 3. the system provide QR code scanner every time the user enter a place so that they can check whether it is a safe place or not as in Figure 4. both system requires authorization and need to update health status.
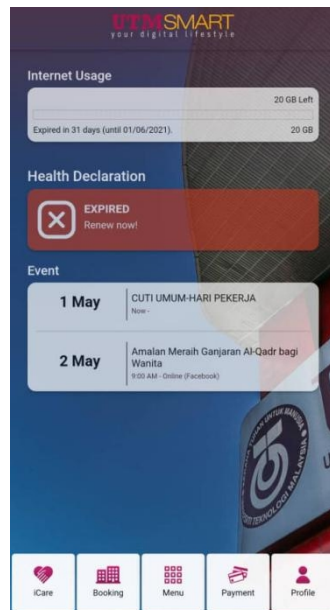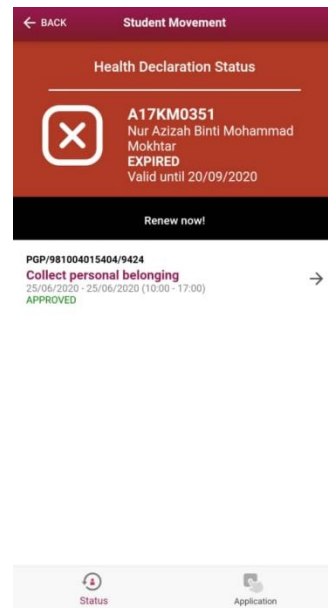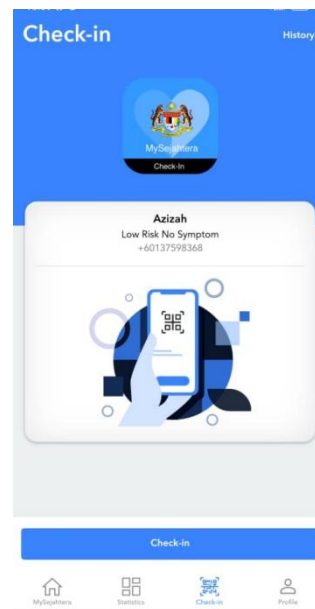
Figure 1

Figure 2

Figure 3

Figure 4

A.2.1 Software Process Model

The software process model of this proposed system is a waterfall model because it is a plan driven process where consists of separate and distinct phases of specification and development. It is the most suitable model to be implemented as we are only given two months to complete the system. In the first month, the requirements definition and system and software design should be accomplished within the first two weeks. The following weeks should be focused on improving the existing design continued with implementation and unit testing. Lastly, the second month should process the implementation and unit testing phase followed by integration and system testing and operation and maintenance.

A.2.2 Gantt Chart

	Task Name	Duration	Start	ETA	1st week	2nd week	3rd week	4th week	5th week	6th week	7th week	8th week
1	Requirements definition	3 days	01.05.21	05.05.21								
2	System and software design	7 days	08.05.21	17.05.21								
3	Implementation and unit testing	12 day	16.04.12	16.04.12								
4	Integration and system testing	10 days	17.04.12	18.04.12								
5	Operation and maintenance	8 days	19.04.12	19.04.12								

Table 1 : Gantt Chart

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Section B: Agile Software Development

B1.1   Agile Methodology

Based on Boehm's work on agile methodology the five factors are personnel, dynamism, culture, size and criticality. This method enhances the ability of key development team members to understand their environment and organizational capabilities and to identify and collaborate with the project's stakeholders (Boehm & Turner, 2003). For personnel, it needs level 2 and lower experts for the first phase in software model. Meanwhile, level 2 and 3 experts are needed until the end of the phase. It can accommodate some level 1B people as well. Next, dynamism of requirement change/week is a detailed plan of workflow and excellently stable working environment. The next factor is culture which brings comfort and empowerment for people. Each person has their roles assigned by policies and procedures or prosper on order. Besides, size of number of personnel depends on the methods evolved in handling products and teams. Lastly, criticality is focused on loss due to impact of defects throughout completing this proposed system.
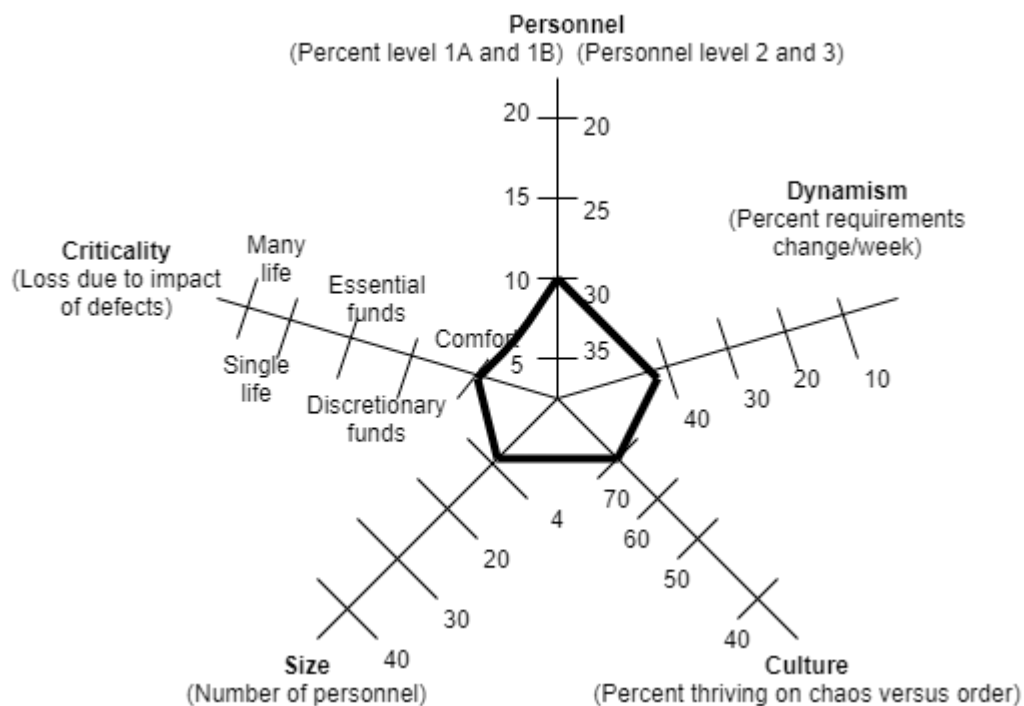

Figure 5 : Spider Web Chart

B1.2 Plan-Driven and Agile Development

Balancing between plan-driven and agile development is in terms of customer availability and scope or features. Firstly, in terms of customer availability, it requires customer involvement only at testing phase. The customer should evaluate iterations of the system and decide the features to be included in each successive progress. Next, the scope of this method is to complete the system within two months. The system need to include the return-back application, health declaration and isolation status features.

B2.1 User Stories

User Story 1 :

As a student I want to apply for an approval from HEP so that I can return to the campus. First, I need to login to the system by inserting username and password. After authorized by the system I can go to the return-back feature and apply for an approval by fill in the form. Before submitting through the system, I need to obtain my academic advisors' consents. after submitting, I can check my application status whether it is approved or disapproved. If it is approved, I will be able to download the cross-state permission letter issued by the HEP in PDF format. Otherwise, I need to re-apply.

User Story 2 :

As a student I want to go through an isolation so that I can stay in the campus. I return to my university using the permission letter obtained earlier. Next, I will start my isolation in the Isolation Center designated by the university. During this process, I can check my status whether I have completed or undergoing the isolation.

User Story 3 :

As a student I want to check my health status so that I can retrieve my room key. After log on to the system as a student, I will go to the health declaration feature I will check health status. If I am in a good condition I will be able to check my college name and room number as well as the entry date. Otherwise, I will need to do more health checkup until I am completely in a good condition.

User Story 4 :

As HEP staff I want to manage the placement of students in the Isolation Center so that there will be enough room as each room can only be occupied by one student only. First, I will log onto the system using my username and password. The system will authorize my account as a university staff. Then, I will go to the isolation feature and check the summary of students who have applied, have returned, in isolation and have completed the isolation period. I also want to obtain the list of students who will come back or have completed the isolation period

on dates I want to manage. All the students that have completed their isolation will be updated and removed from the isolation status. Meanwhile, the incoming students will be placed randomly by the system's algorithm. After that I will organize the room key and necessary need to provide the students.

User Story 5 :

As a RCO staff I want to manages the placement of students in the residential college after the isolation period. After log on to the system as university staff, I will go to the health declaration feature and obtain the list of students that have completed the isolation and in good health. I will assigned their room on the date after their isolation period end. They will be able to retrieve their room key during office hour starting form that day. After updating the hostel status, the system will notifies the students. If they are not in good health, their assigned room will be postponed as more check up will be done.
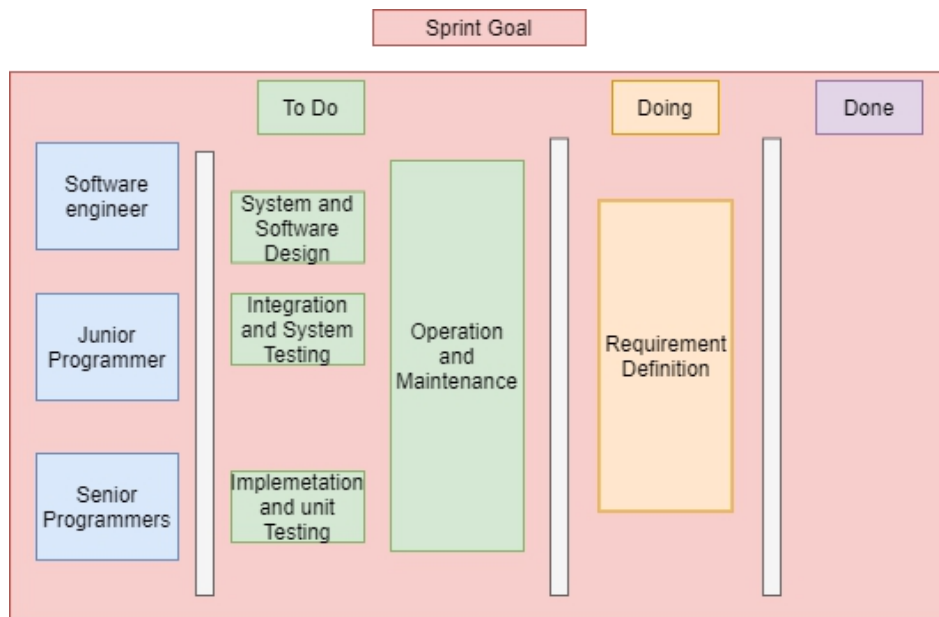
B2.2 Task Board

Initial Task Board

Figure 6 : Task board
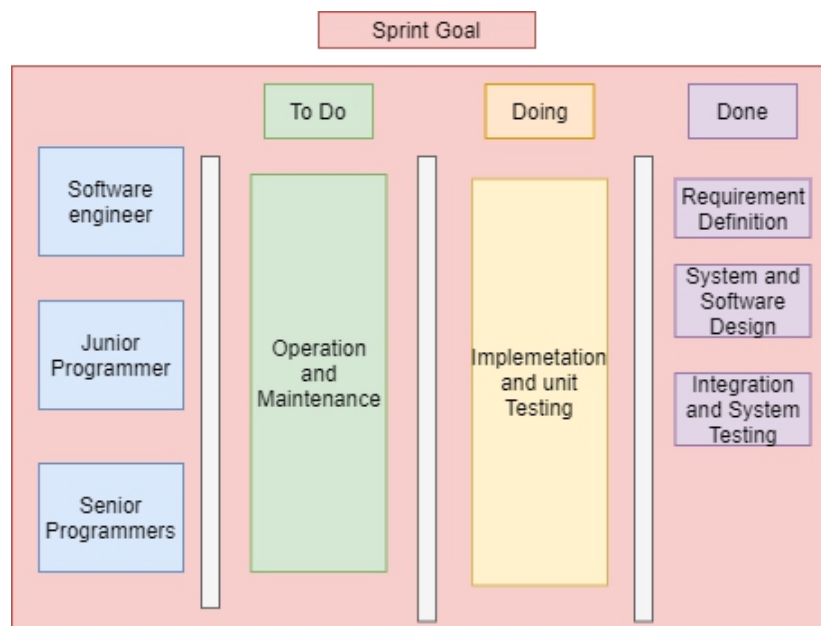
Task Board After One Month

Figure 7 : Task Board after 1 Month

Section C: Requirements Specification

C1.1 Functional Requirements

Function 1

<Each students shall be able to apply for return back application, check health declaration and check isolation status>

Function 2

<Each RCO staff shall be able to manage the placement of students after the isolation period and check the students information>

Function 3

<Each HEP staff shall be able to manage the placement of students for the isolation period and obtain list of students involved>

Function 4

< The system shall provide a statistical summary of students who have applied, have returned, in isolation or have completed the isolation period>

Function 5

<Each user using the system shall be uniquely identified by their own ID and password>

C1.2 Non-Functional Requirements

NFR1

Organization Requirement - Operational

<Users of UTM MyReturn shall be identified by their authorized username and password>

NFR2

Product Requirement - Dependability

<The system shall be available to all authorized user regardless the time. Downtime shall be notified one or two day earlier>

NFR3

External Requirements - Safety

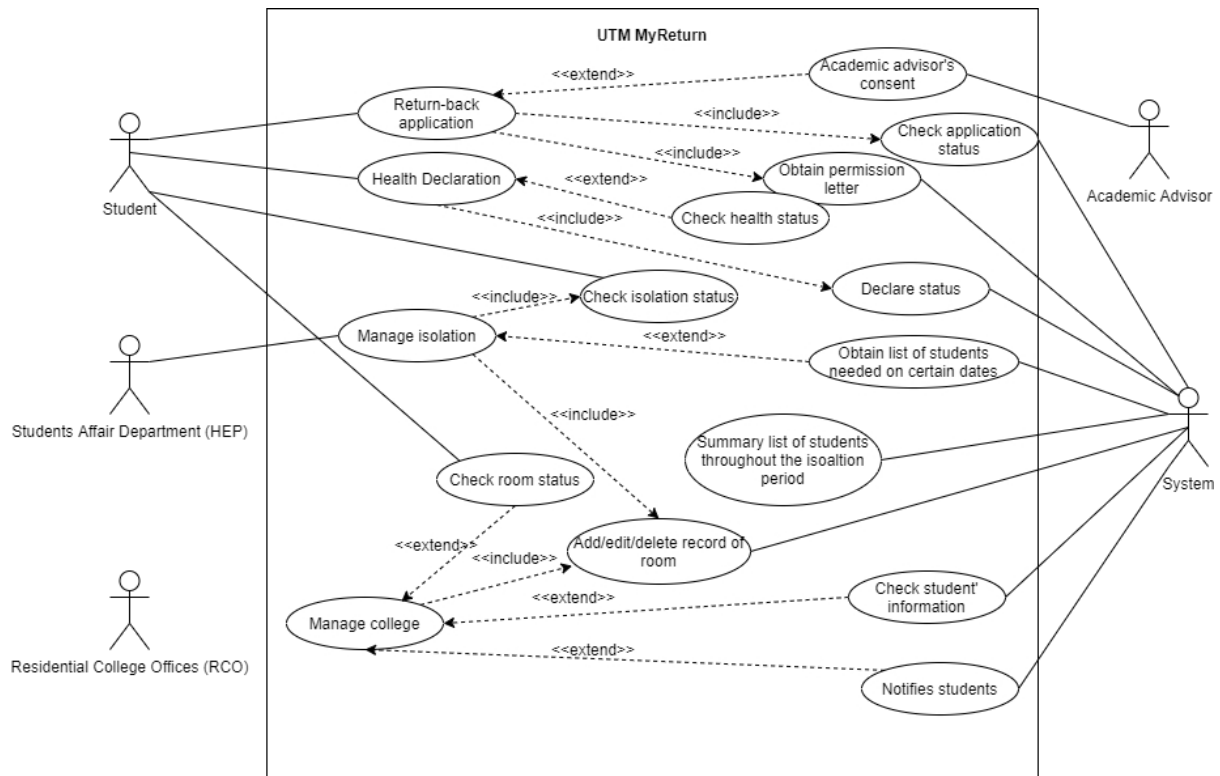<The system shall implement privacy towards all data saved and used in it>

C2.1   Use Case Diagram

Figure 8 : Use Case Diagram

C2.2   Use Case Description

UC1: Use Case <Manage Isolation>

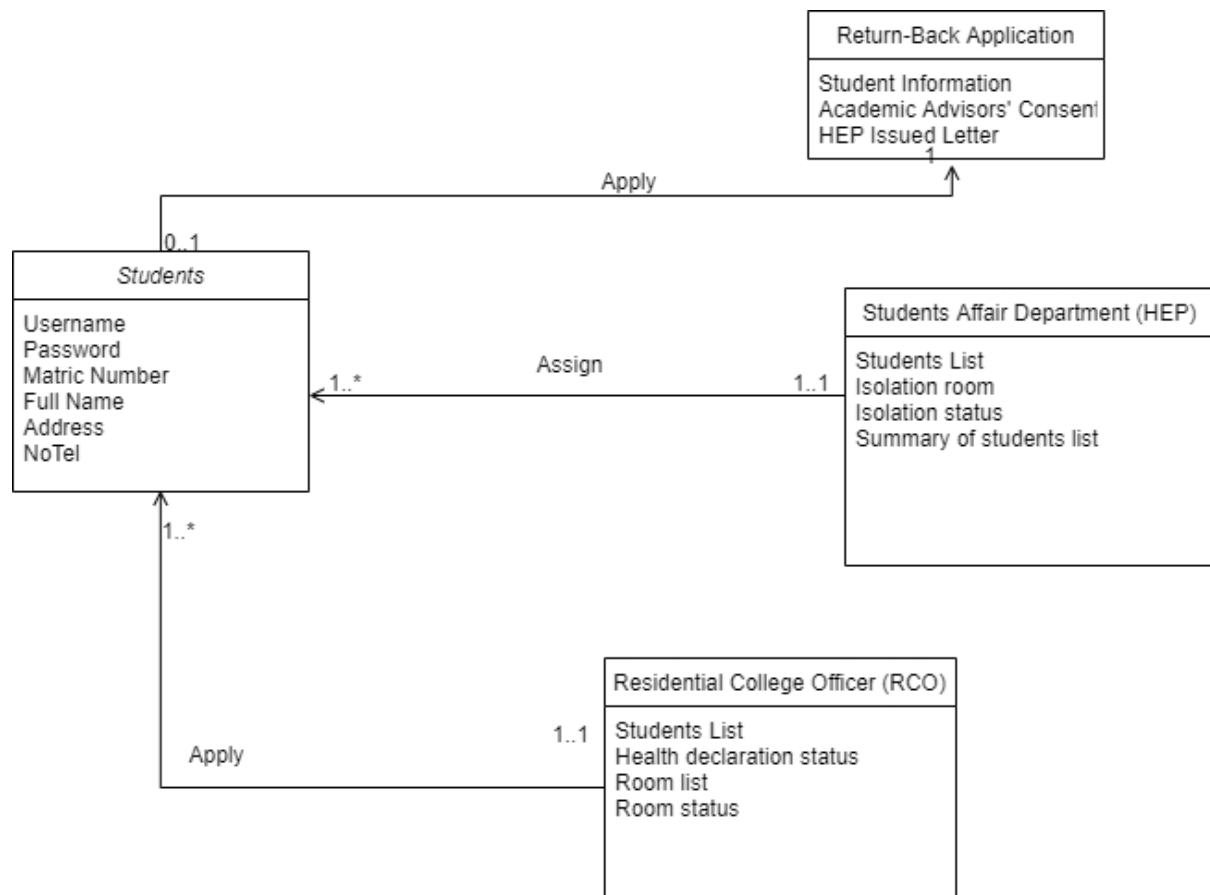| Use Case : <Manage Isolation> |
| --- |
| **ID** : UC1 |
| **Actors** : Students Affair Department (HEP), System, Students |
| **Preconditions** :
The user have authenticate themselves using their own unique ID |
| **Flow of events :**
1. Obtain the list of students throughout the isolation
2. If the students who have completed the isolation
      Edit the categories to complete and room unoccupied
      Update system
3. If the students is in isolation
      Edit the categories to ongoing and room occupied
      Update system
4. If the students is coming back to campus
      Edit the categories to oncoming and assign unoccupied room
      Update system
5. Obtain the summary of students who have applied, have returned, going through and have completed the isolation period. |

6. Students check their isolation status
Alternative flow 1:
1. At any time, the user can leave the screen
Postconditions:
1. Each room is occupied by only one student.

Table 2 : Use Case Description for Manage Isolation

UC2 : Use Case <Manage College>

Use Case : <Manage College>
ID : UC1
Actors : Residential College Offices (RCO), System, Students
Preconditions : The user have authenticate themselves using their own unique ID

Flow of events :
1. Obtain the list of students' information
2. If the students who have completed the isolation and in good health
    Assign the students to a room and date to retrieve the key
    Update system
    System notifies students
3. If the students who have completed the isolation and not in good health
    Ignore
    Update system
    System notifies students
4. Students check their room status

Alternative flow 1: 2. At any time, the user can leave the screen
Postconditions: 2. Each students must have completed the isolation.

C3.1 Domain Model
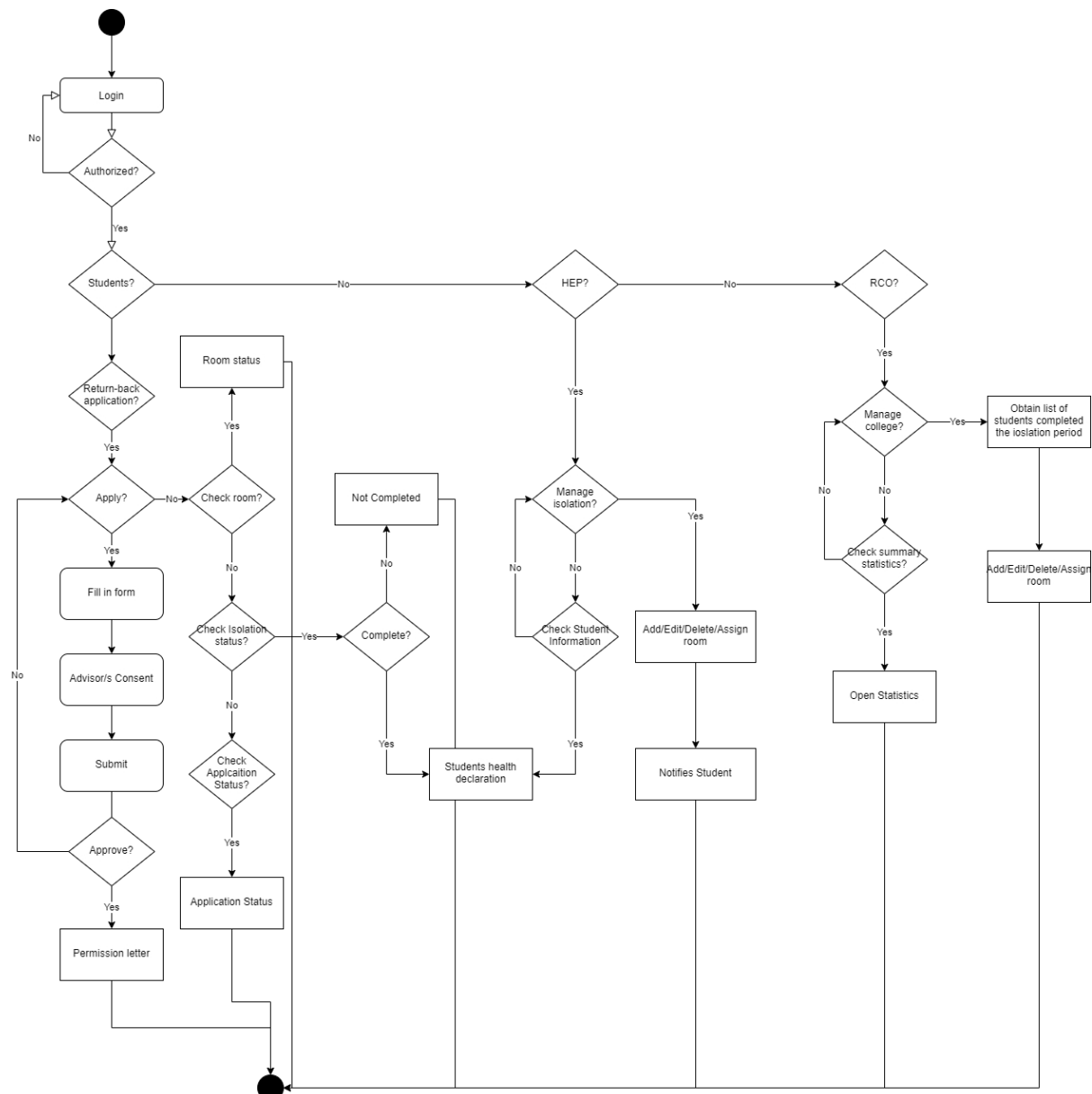

Figure 9 : Domain Model

C3.2 Activity Diagram

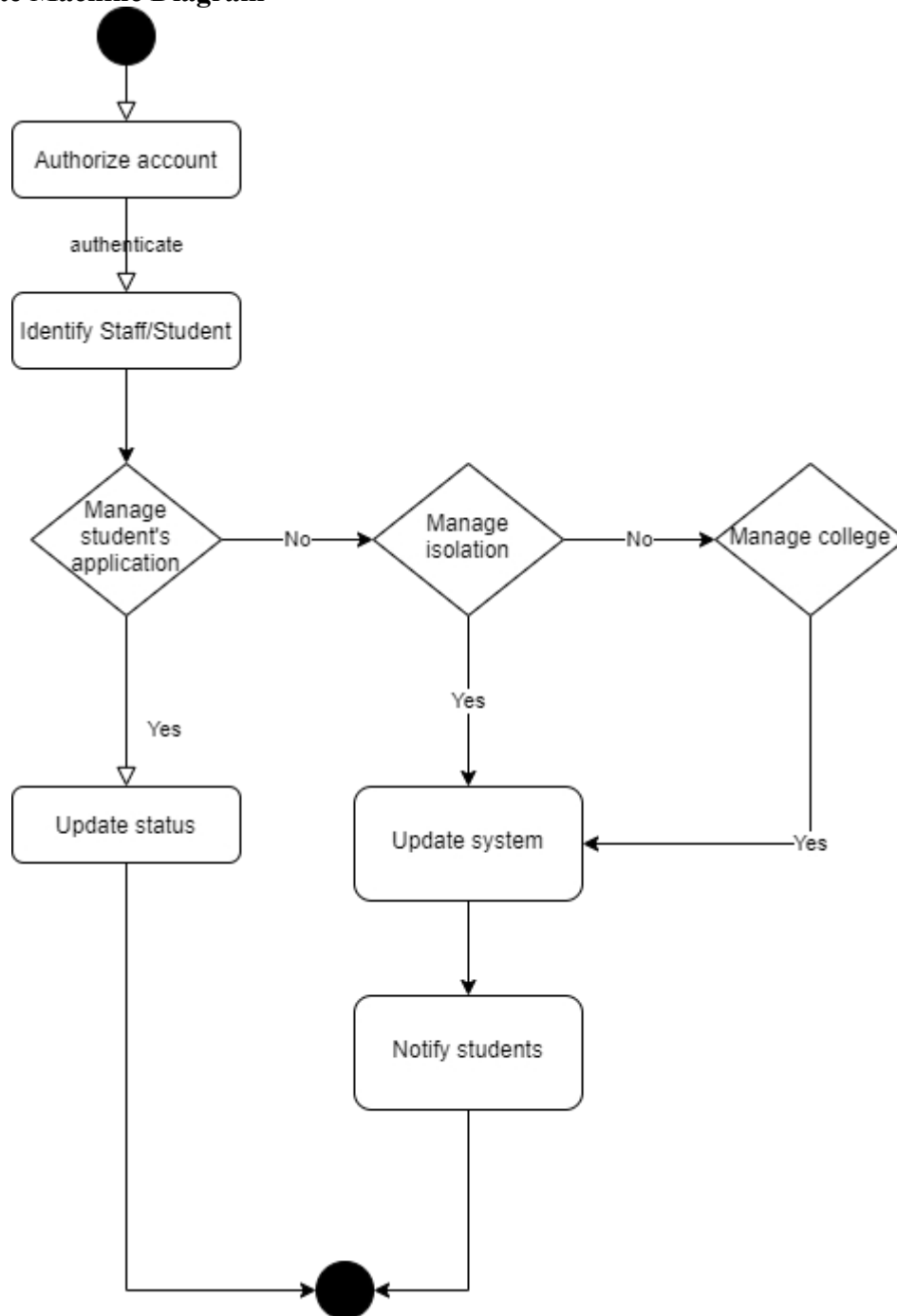**Figure 10 : Activity Diagram**

C3.3 State Machine Diagram

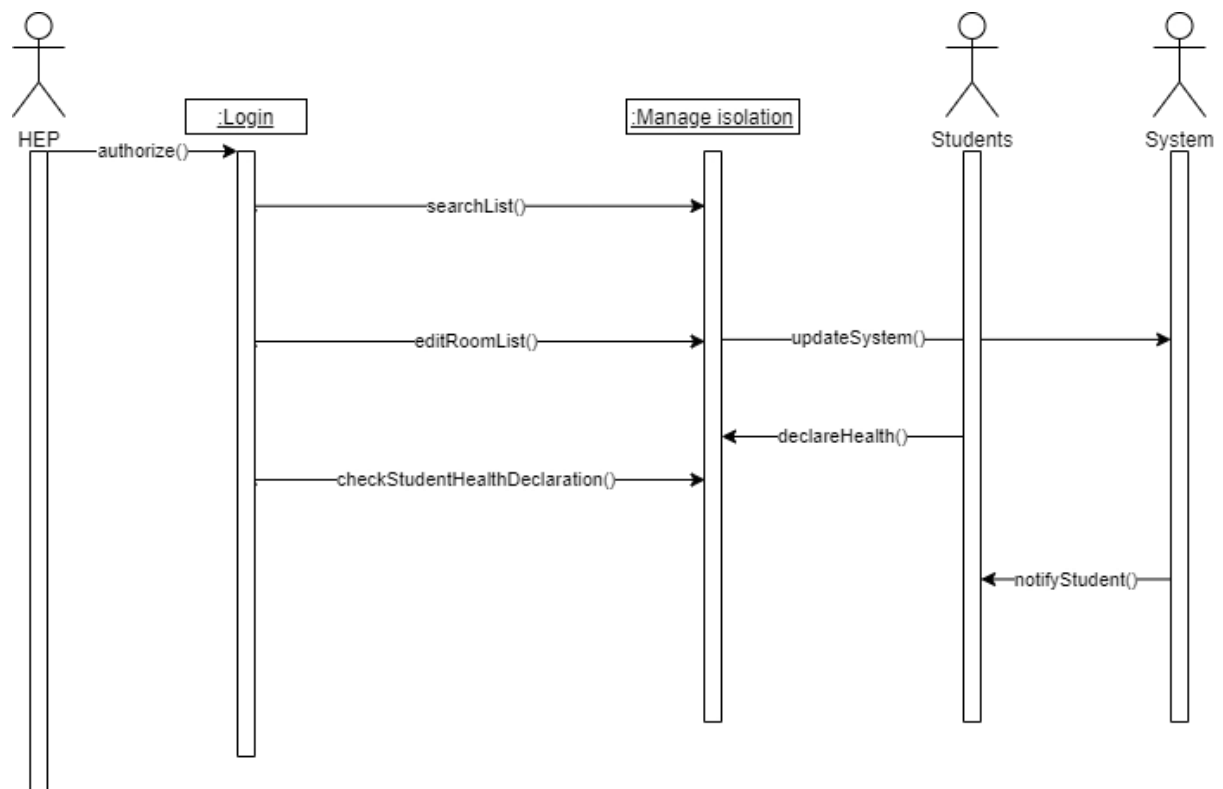**Figure 11 : State Machine Diagram**

C4 Sequence Diagram

Figure 12 : Sequence Diagram

References

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