Project Title: COVID Patient Tracker System

Group Number: 05

Group Members:

Student ID	Student Name	Theory Section
18301279	SADIA SOBHANA RIDI	08
19101097	JANNATUL FARZANA TANDRA	08
19101098	MAHMUDUL HASAN EMON	08

Date of Submission: 12th September, 2021

1. Introduction

Covid-19 which was presumably originated in bats and was transmitted to humans by means of unknown mechanisms in Wuhan,China in December 2019 has affected more than 180 countries and this is the first pandemic known to be caused by a new virus.Because of the sudden rise of covid-19, investigations into the disease, patient report tracking mechanisms and case reports transmission has become slow which has led to a sluggish treatment progress to control everything effectively. However, using today's advanced technology we can fight against this infectious disease and improve the speed of the data. To prevent this challenge, we developed a web application named "**COVID PATIENT TRACKER SYSTEM**" which will help the govt and hospitals to track the patient's condition and prevent the worst case wisely. This web application consists of user registration and during the registration phase each user has to provide their unique name and password and later they can update their personal information regarding health and tracking the list of infected patient's information hospital authority can update their icu bed's , oxygen availability , doctor appointment eltc.Furthermore, hospital authority will send their daily updated COVID ratio result of affected, died, recovery list of the patient's to the government so that analyzing the data govt can alert people via emails or sms message services and enforce lockdown into the red zone areas. With this awareness, people with higher risks will be notified automatically to get self quarantined and hopefully it will lessen the list of covid people. We have expected that our proposed system can contribute to the control of the covid-19 situation.

2. Motivation

Since we are in a pandemic situation because of covid-19 and almost every hospitals and govts are in a huge pressure to tackle all this situation at a time and serve all the people individually has become very troublesome that's why to make a smooth a road between the patient's, hospital authority and govt we thought of making this system.The main purpose of this system is to register and store users details and retrieve those information when it's required as per their necessities and it will be more easier for the users to avoid all the worst situation as they can get their appointment any time without any hassle and they don't even need to go to the hospitals to book an appointment so it also saves their time.And hospitals can update their list according to the number of affected or unaffected patients and sorting the list they can send it to the govt to take extra effective action to reduce this situation as soon as possible.So, we can say it's a user friendly simple system yet very efficient and time saving for everyones.

3. Project Scenario

There are mainly three types of actors in the COVID patient tracker system. They are the patient, the hospital authority and the government. The primary actor of this system is patient whereas the hospital authority and the government are secondary actors respectively. To use this system both the actors first need to login using their unique username and password. They can choose their preferred language is either Bengali or English. After logging, patients can view their preferred hospital's updated list of available ICU beds, ambulance, emergency contact number, doctor's appointment time, oxygen availability, vaccine amount etc. After viewing the availability patient can book a doctor's appointment, can book a COVID test date, can book a vaccine date. If they find there are no slots available they can request to add a queue on that slot if that slot is open again, then they can book their desired slot. Also they can call an emergency ambulance or emergency doctors when they need to. The system shows a notification to the patient if they successfully booked their slot. Patients can anytime cancel their booking. The hospital authority can update any information on their page on a daily basis such as an updated list of their vaccine amount, ICU beds, doctor's appointments, emergency contact, daily COVID tests, affected persons, dead persons etc. The authority will test every person's COVID variant and send a confirmation to the person that he or she is affected or not. Also when a patient is booking for an appointment the authority verifies their login and appointment and approves their booking by sending a confirmation. Moreover, the hospital authority will send the daily updated COVID ratio result of affected, died, recovery list to the government. Government can login to this system using their unique username and password. They can see the updated COVID ratio list sent from

the hospital authority. After observing the ratio, they can enforce lockdown in the red zone area where the affected ratio or death ratio is high. Also they can create awareness to the common people using this system by sending SMS like “Wearing mask, Sanitizing hand” etc.

4. System Request

Project Sponsor:

Mahmudul Hasan Emon, Researcher and analyst of Bongo-vax.

Business Need:

This system will help tracking COVID patients so that Upazila, Medical officer and health department can take necessary steps such as isolation, duty officer and oxygen availability. This will also help researchers of COVID to detect the symptoms of affected persons and determine whether that person is affected by the new variants of COVID or not by which they can inform the respective authorities to enforce lockdown in that person's house and his or her nearby locality.

Business Requirements:

● The system should allow the customers to choose their preferred language.

● Person should be able to test himself/herself to the nearest COVID hospital by taking appointments from this system.

● Person should be able to know his/her COVID test result within 24 hours through this system.

● Patients should be able to contact emergency doctors and can take suggestions by informing their (patient's) symptoms to the available doctors through this system.

● Anyone can book emergency isolation, ambulance through this system which is directly connected through "***Jatiyo Joruri Sheba-999***".

● Eligible persons for taking their desired vaccine should be able to book his/her vaccination date according to the availability of vaccine through this system. Moreover, after a fixed period of time the system will automatically inform that person to take his/her next dose of vaccine.

● Health department of our country should be able to know each day how many people get affected, how many people die and how many people recover through this system which will help the responsible authority to daily update the ratio of affected, dead and recovery percentage. By analyzing it, the Government will benefit to take necessary steps such as ‘lockdown’ or anything that is necessary.

● Government should be able to alert the common people to things such as wearing a ‘face mask’ or ‘sanitizing’ or ‘stay at home’ via SMS through this system.

Business Value:

Our system can not only provide COVID affected patient’s data but also allows local hospitals or medical centers to identify a patient's location accurately. Provide faster ways of getting COVID essentials such as face mask, hand sanitizer, gloves, prescribed medicine as well as emergency

ambulance service. People can be benefitted as they will be able to find affected areas and try not to go there. For this, the percentage of COVID affected people will decrease by minimum 20-30%.

The death rate by COVID will be reduced when the health ministry will isolate that area. Patients' satisfaction must be prioritized. Referral of patients, doctors, health ministry. Increase of recovery percentage because of getting awareness will increase 5-10%

Business Constraints:

● The system requires it to be updated 24/7 as it's necessary to check the list whether the patient number increases or not.

● Patients should fill up their registration form within a deadline to get the Covid-19 vaccine through this system.

● Security flaws in the system could allow the hackers to access the patient's highly personal information including the name, bank information, messages and his national id number.

● Technical barriers can be a threat for the system as not everyone has a compatible smartphone or access to the internet connection.

● Privacy concerns related to user data might affect the acceptance and unwillingness to use this tracking system.

● promoting this new system into the remote and unprivileged areas and making them adapt to it is very challenging.

5. Requirement Analysis

5.1. Functional Requirements:

1. Authentication:

1.1. System will provide a google form to register new users.

1.2. Users can login with their username and password.

2. Booking appointment:

2.1. Users can search for their preferred hospital where they can test themselves.

2.2. Users will be able to book appointments of doctors according to their symptoms, booking for emergency isolation and also they can book for vaccination date by checking the availability of the vaccine.

2.3. Users can see their bookings by visiting their profile and anytime they want they can cancel their booking.

2.4. Users will be able to apply for a request to be added to a queue if they are not able to book any appointment by which system will automatically send that user a notification if any slot gets managed because of the cancellation of another user's appointment.

3. Administrative function:

3.1. Authority will be able to login their desired page by using their administrative username and password.

3.2. Authorities will be able to update their database of affected, recovery, and dead patient ratio on a daily basis.

3.3. Authority will be able to provide their available doctors list, number of isolati beds, amount of vaccines in this system.

3.4. Authority will be able to respond to this system user's questions and any oth necessary by using their hotline number.

3.5. Authority will be able to analyze user's COVID test results by viewing their reports.

4. Regulatory requirements:

4.1. Government will be able to enforce lockdown by analyzing the daily summary of COVID affected, recovery patient list.

4.2. Government will be able to encourage common people through this system to wear 'face-mask', 'hand-sanitizing' and if anyone does not follow this, then the government will be able to enforce a fine on him/her.

5.2. Nonfunctional requirements:

1. Operational:

1.1. The system should be able to work on any web browser such as Microsoft Edge, Google Chrome, Safari etc.

1.2. The database of the system will be managed using Oracle 12c.

1.3. The system will be designed by using the python programming language.

1.4. The system is expected to run on any windows, mac-OS and smartphone environments.

.

.

2. Performance:

2.1. The system provides acknowledgement within just 2 second once the patient information is checked.

2.2. The system should be able to support at least 1000 patients at once.

2.3. The system will notify the covid test result within 24 hours to the patient.

2.4. The system will be kept updated within every 5 milliseconds.

.

.

3. Security:

. **3.1**. Users using this system need to hold a login ID and password.

3.2. In case of forgotten the password/id, a security question and a reference email option will be provided during the registration for the users.

3.3. The system must be protected from all unauthorized attempts to read or modify its data.

.

3.4. Administration should be able to view and modify all the information in the system.

3.5. Users' personal information should be protected by the system.

4. Maintainability:

. **4.1**. The system should provide the capability to back up their data.

4.2. The system should be able to keep track of every error as well as keep a record of it.

4.3. The cost of maintaining the system should be low.

.

5. Reliability:

5.1. The downtime for the system must be less than 10 hours in a week.

5.2. The system should be robust, bug free and satisfy all the requirements for the users.

5.3. The accuracy of the system shall be high and probability of failure shall be less than 0.5.

6. Cultural and Political:

6.1. The system should not display any religious symbols or words that might possibly offend any users.

6.2. The system must go accordance with the Digital Security Act of Bangladesh.

6.3. The system should produce all output in Both Bangla and English language.

6. Design Diagrams

Six design diagrams have been included in this report to describe the system. They are the use case diagram, activity diagram, sequence diagram, state machine diagram, data flow diagram and the window navigation diagram.

6.1. Use Case Diagram

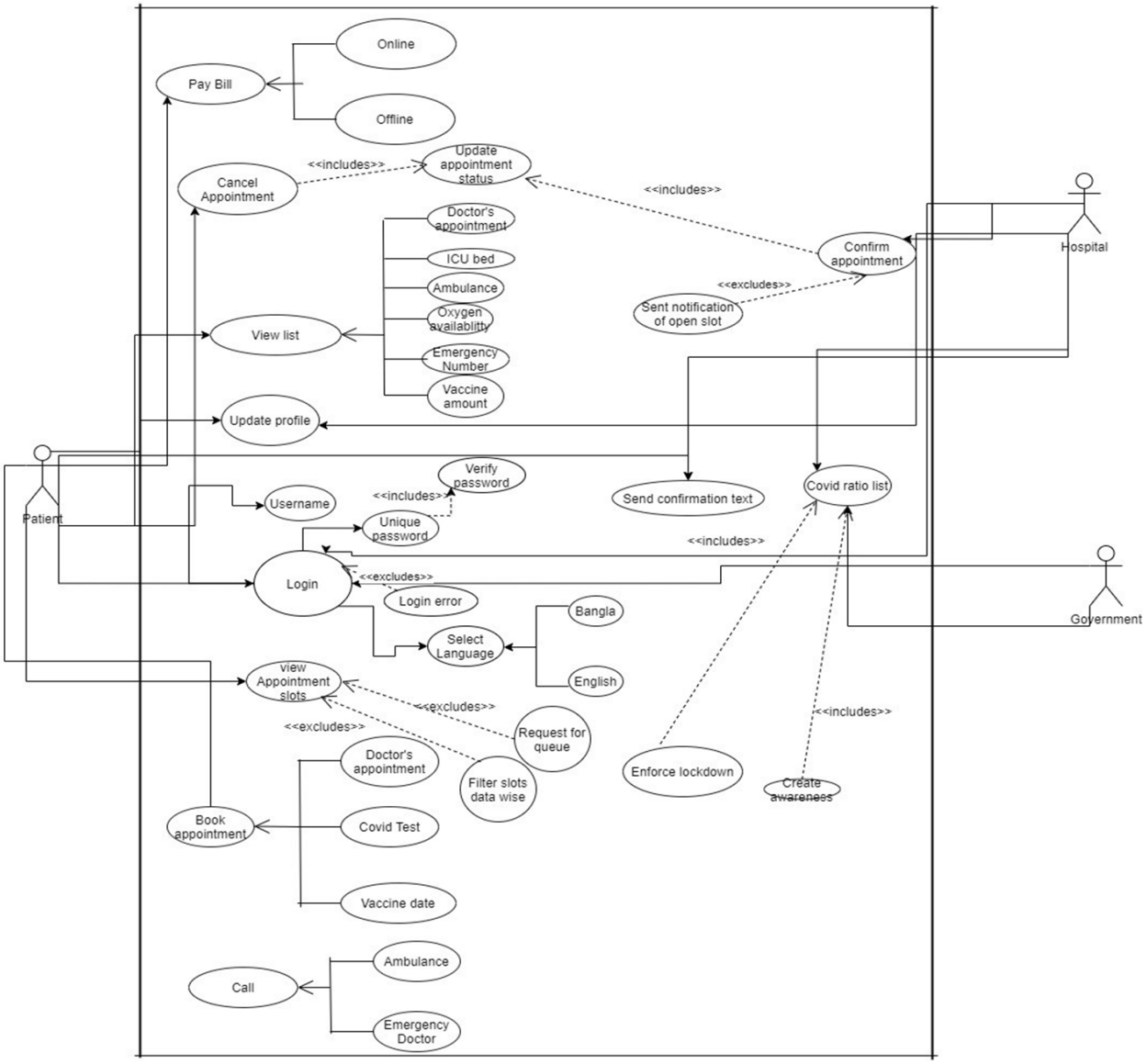

Figure 1: Use case diagram

6.2. Activity Diagram

6.2.1 Activity Diagram for Patient and Hospital Authority

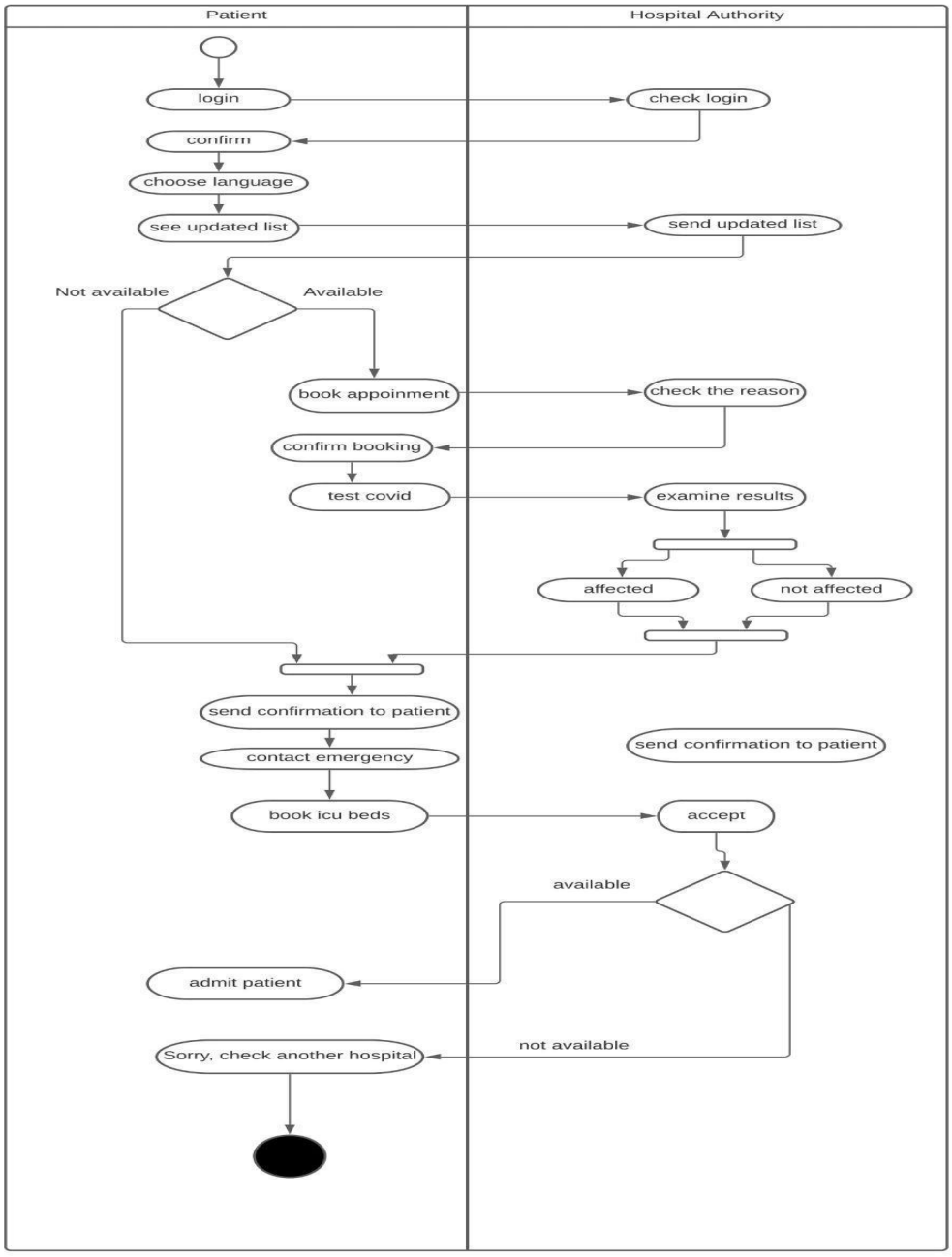

Figure 2: Activity diagram for Patient & Hospital Authority

6.2.2 Activity Diagram for Hospital Authority and Government Authority

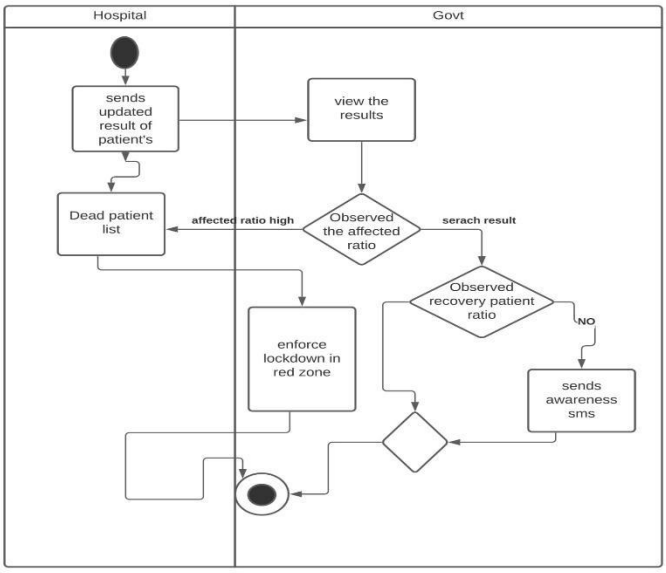

Figure 3: Activity diagram for Hospital Authority & Government Authority

6.3 Sequence Diagram

6.3.1 Sequence Diagram for Patient and Hospital Authority

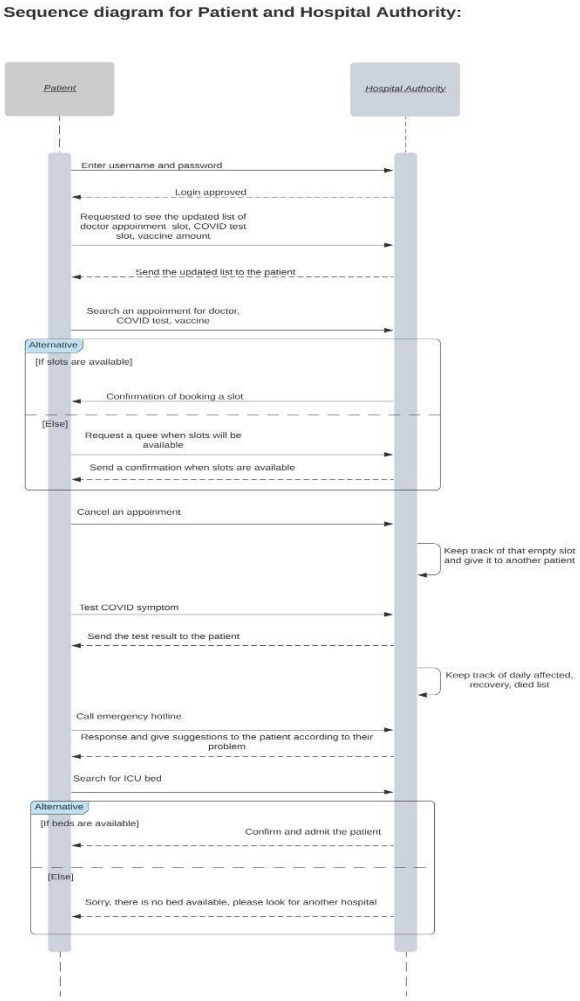

Figure 4: Sequence diagram for Patient & Hospital Authority

6.3.2 Sequence Diagram for Hospital authority and Government authority

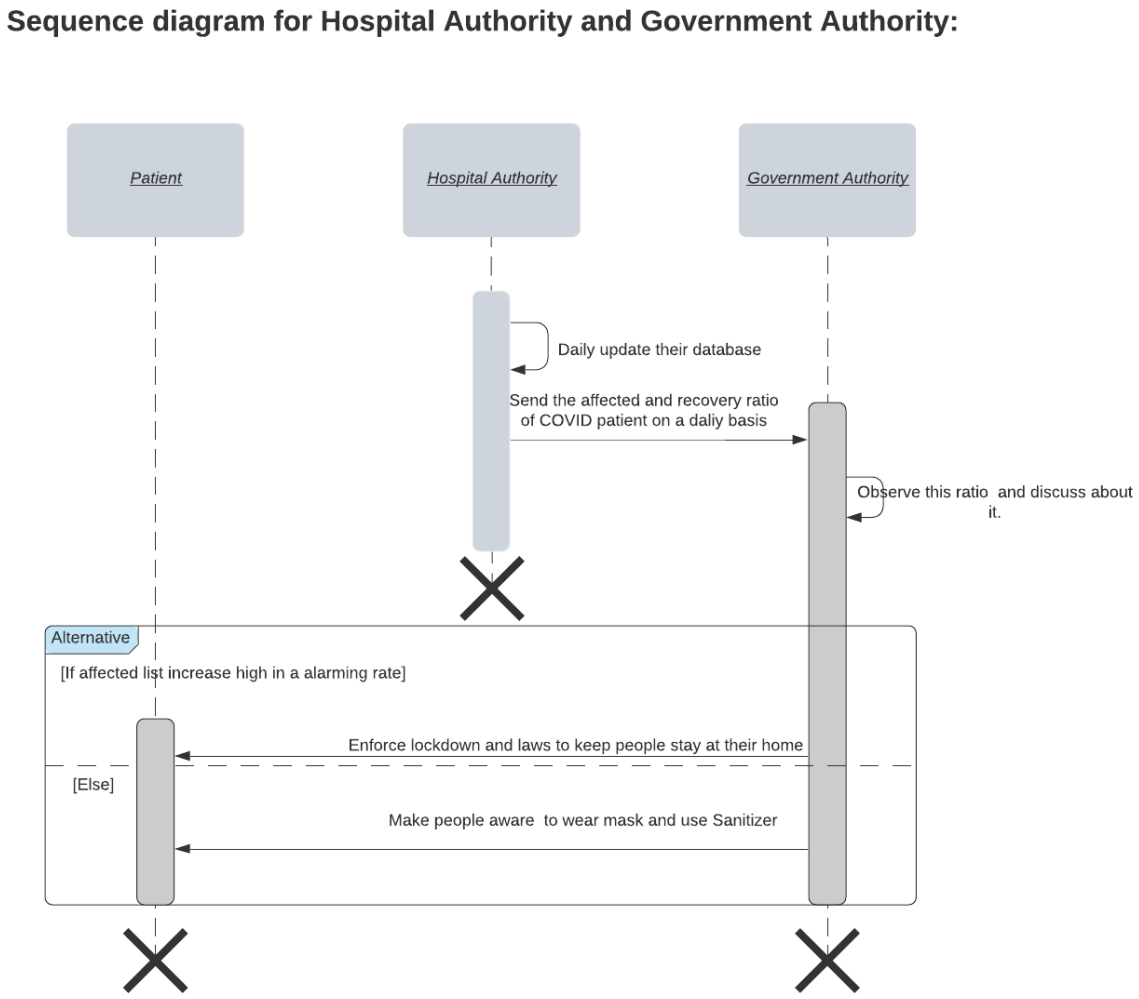

Figure 5: Sequence diagram for Patient & Hospital Authority

6.4 State Machine Diagram

6.4.1 State Machine Diagram for login

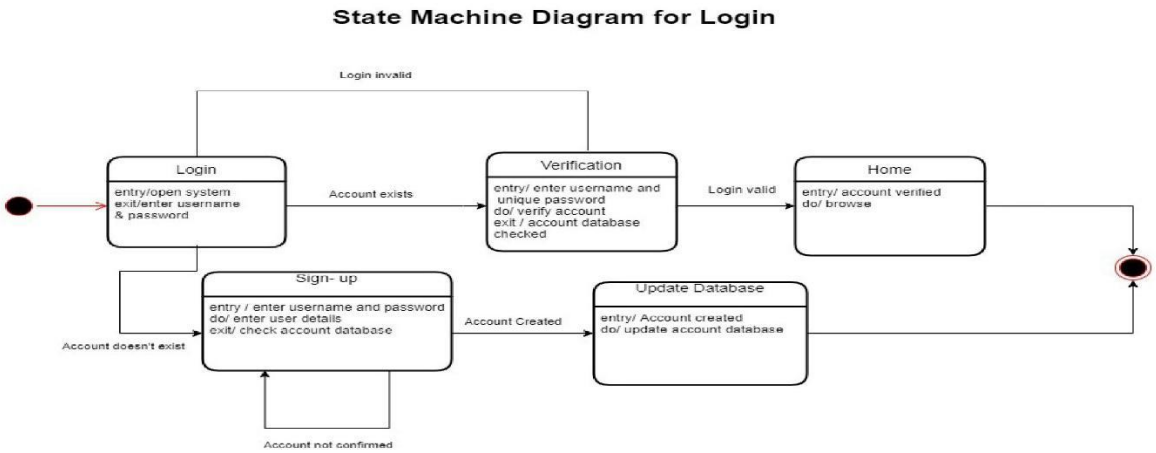

Figure 6: State machine diagram for Login

6.4.2 State Machine Diagram for Appointment Database

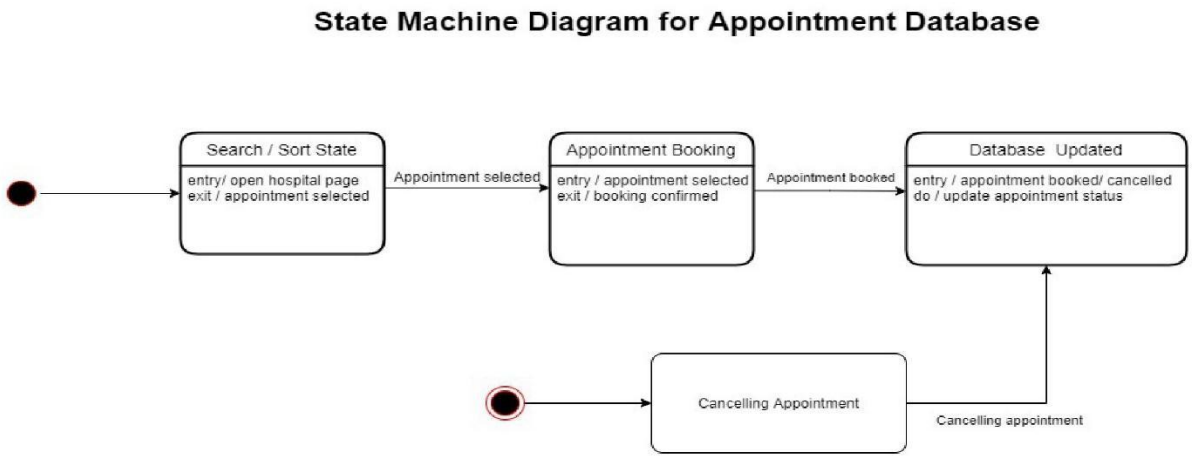

Figure 7: State machine diagram for Appointment Database

6.4.3 State Machine Diagram for Hospital Management

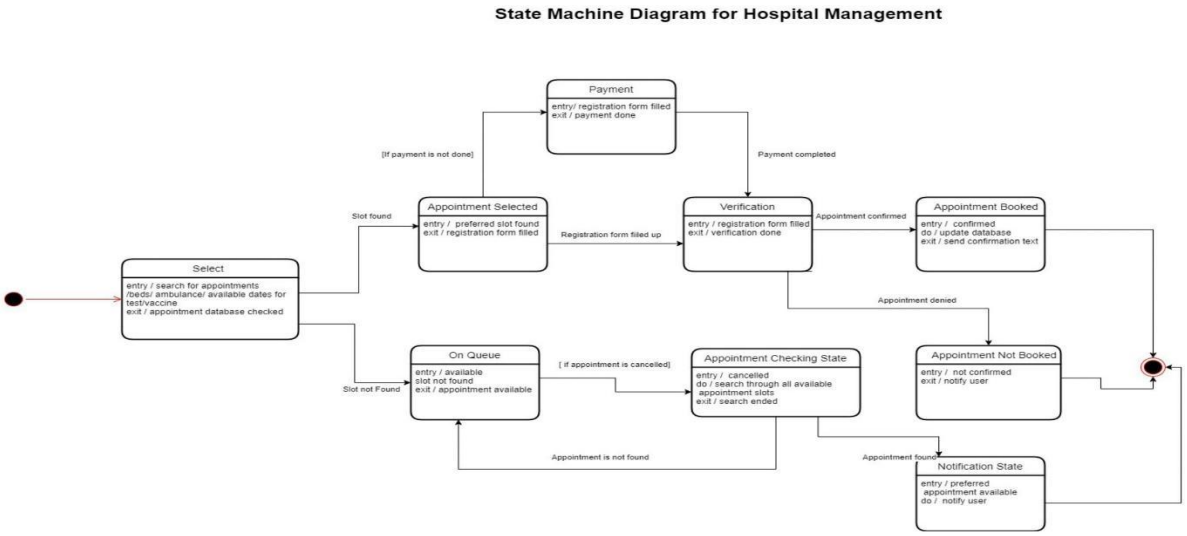

Figure 8: State machine diagram for Hospital Management

6.5 Data Flow Diagram

6.5.1 Context Diagram / Level 0 Diagram

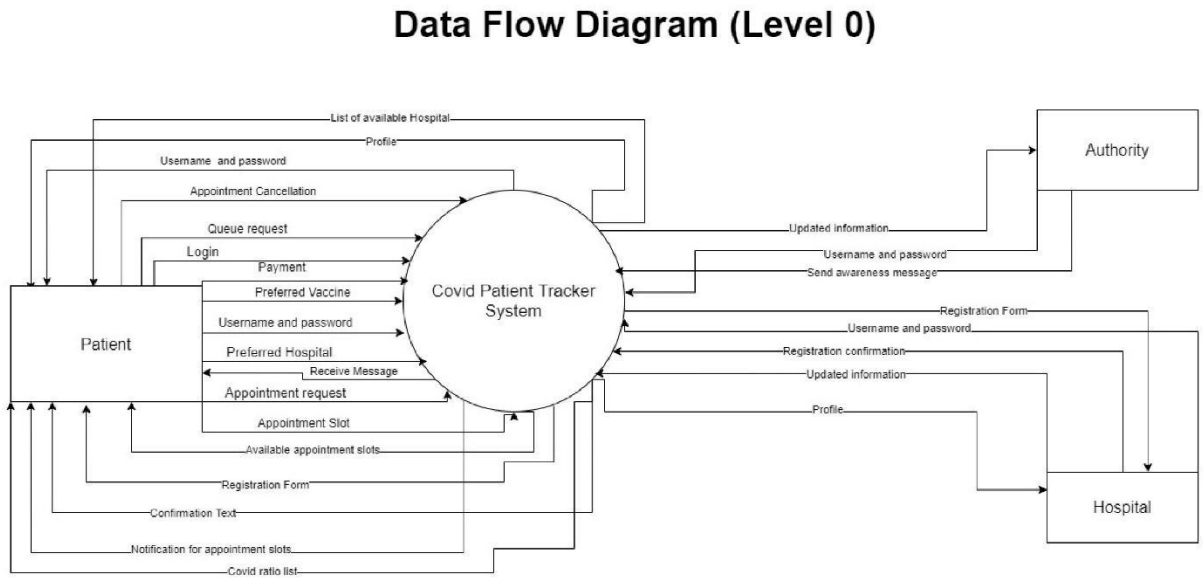

Figure 9: Context diagram or Level 0 diagram

6.5.2 Level 1 Diagram

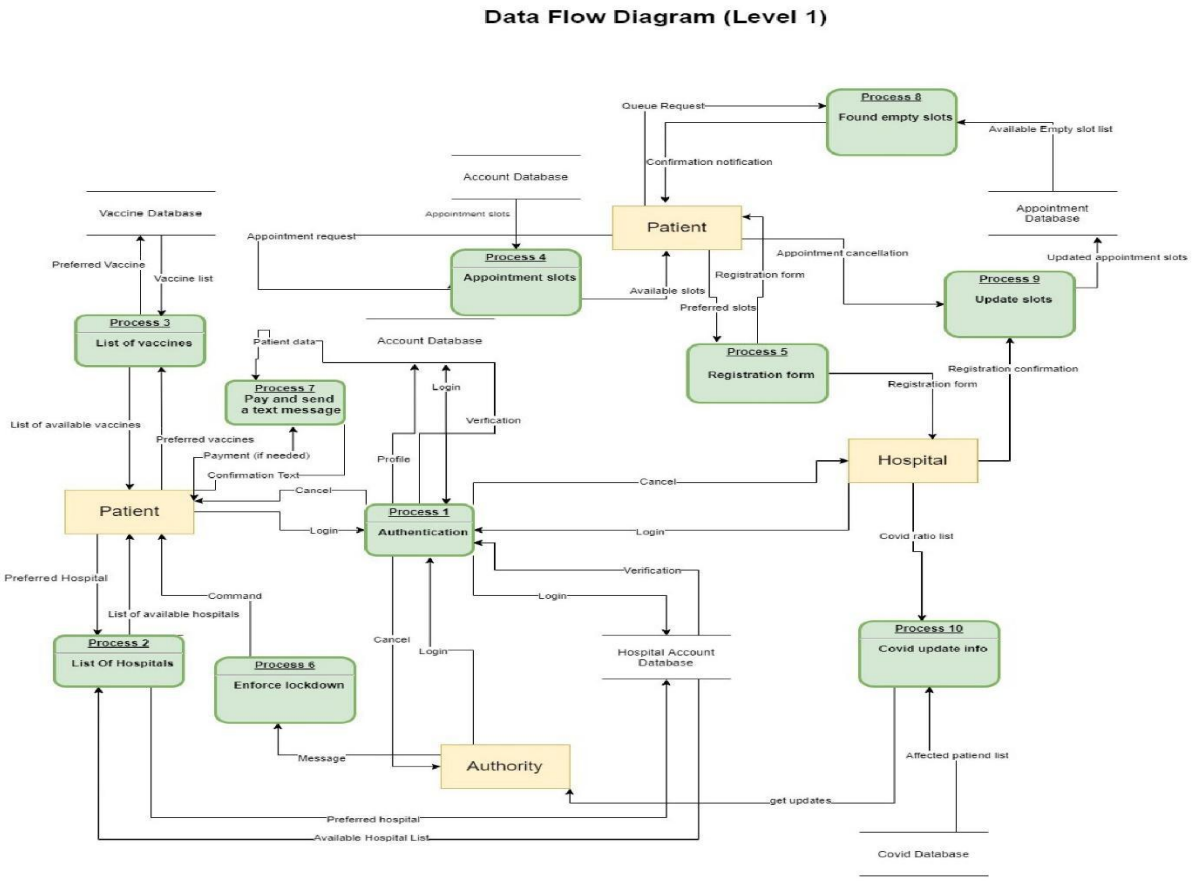

Figure 10: Level 1 diagram

6.6 Windows Navigation Diagram

6.6.1 Windows Navigation Diagram for Sign up

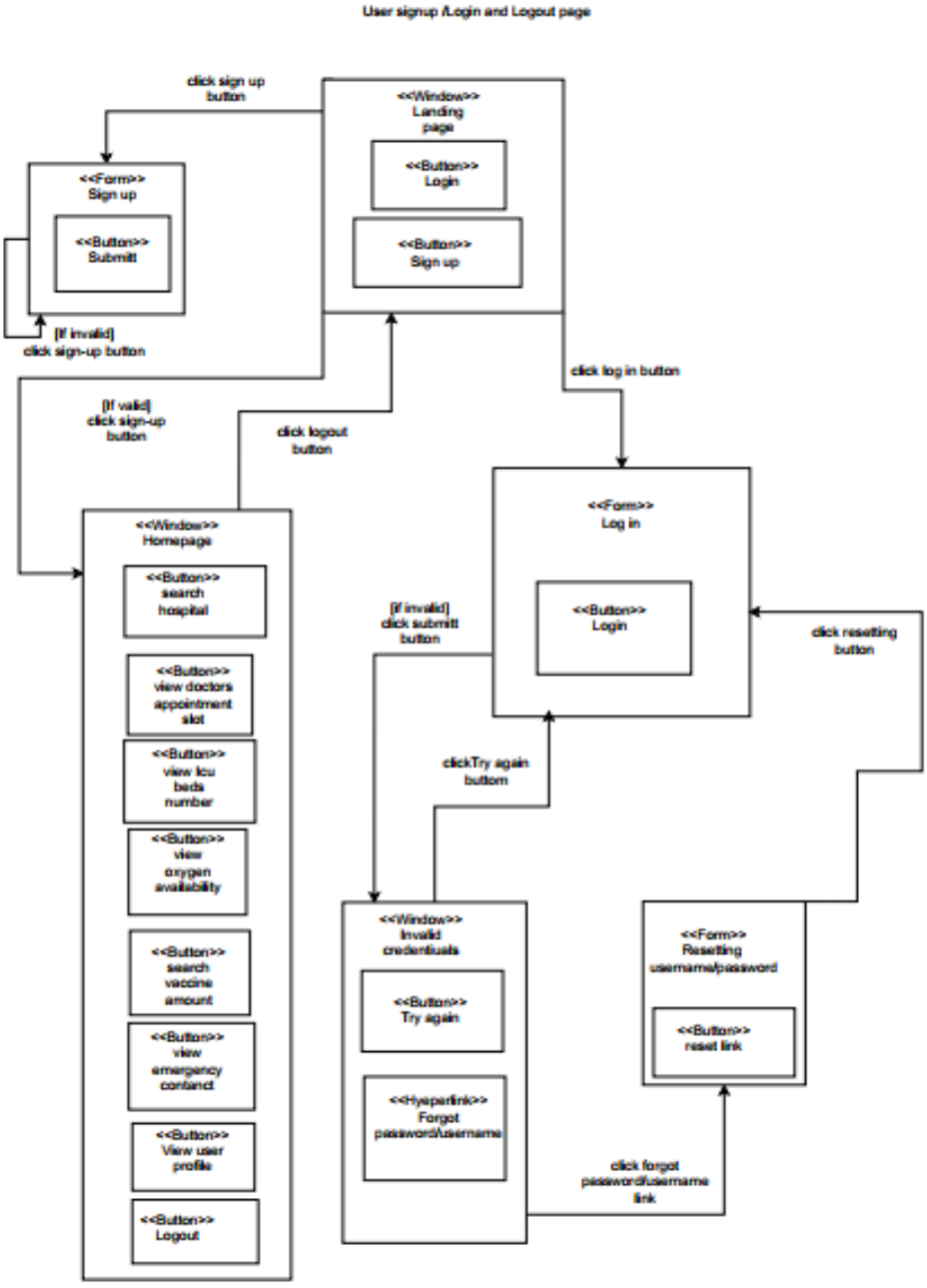

Figure 11: Windows Navigation Diagram for Sign up

6.6.2 Windows Navigation Diagram for Booking appointment

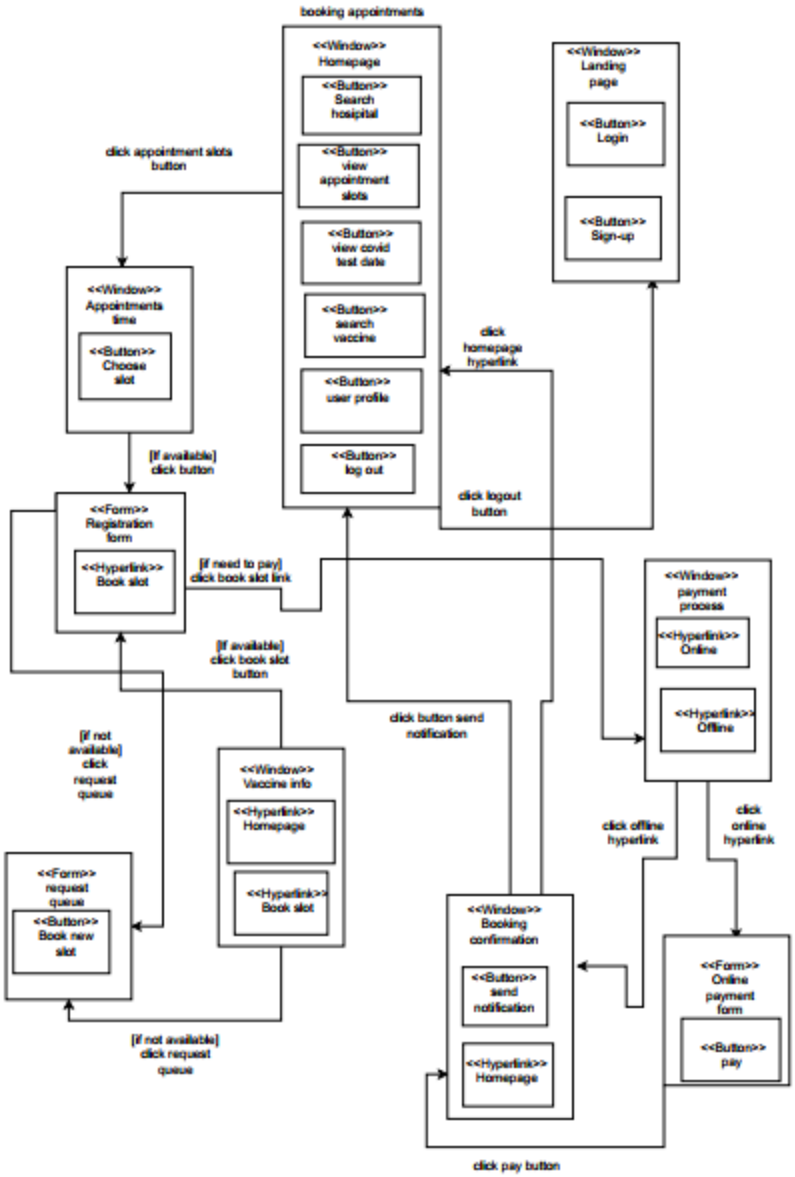

Figure 12 : Windows Navigation Diagram for Booking Appointment

6.6.3 Windows Navigation Diagram for Cancel Appointment

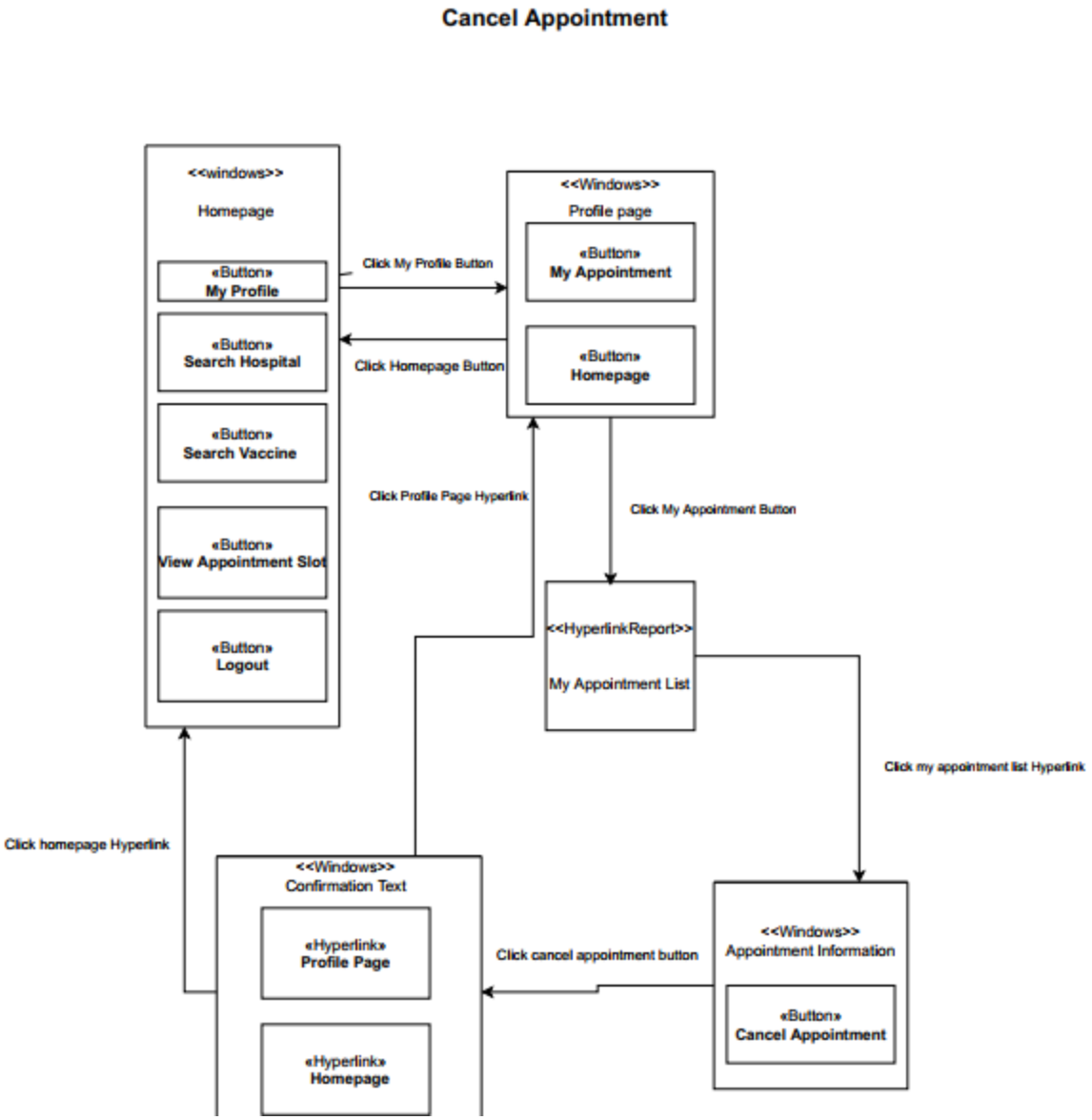

Figure 13: Windows Navigation Diagram for Booking Appointment

6.6.4 Windows Navigation Diagram for Hospital authority and Government authority responsibilities

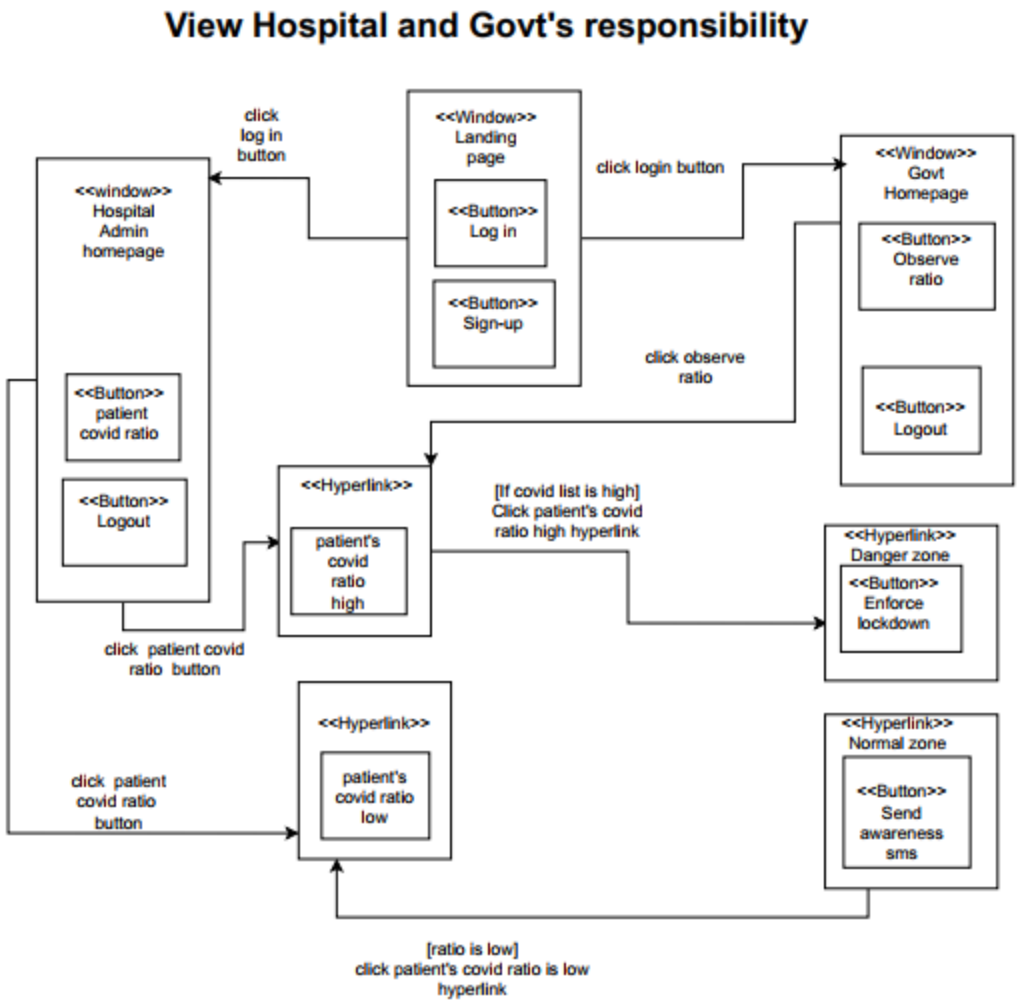

Figure 14: Windows Navigation Diagram for Hospital authority and Government authority responsibilities.

7.Conclusion

We created this system so that we can track down patients' reports and provide them a better service and this will help to prevent disease spread .Moreover, hospital and govt authority will be able to analyze the patient's data and observing those they will generate all the required alert to the important events and notify the associated users about their risk levels.Because of our systems alert sms the probability of getting infection from one person to another will be much lesser than the usual times.Also , our system can help researchers to analyze data from different countries and outcomes from this research could help to fight against this virus .Furthermore, we will protect all our users data so that no can do any harm to them using their personal information and to make it more flexible we have provided to option to book appointments of doctors, vaccination and covid test slot by using their smartphones or windows at home without losing any time.To conclude we want to say that, everyone's life are at risk and to prevent this challenge we have designed this simple method to serve proper treatment to all the patients and make awareness between the people and if it saves someone's life then it's worth all the pain

THE END