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SOFTWARE REQUIREMENT SPECIFICATIONS

COVID-19 VACCINATION PORTAL

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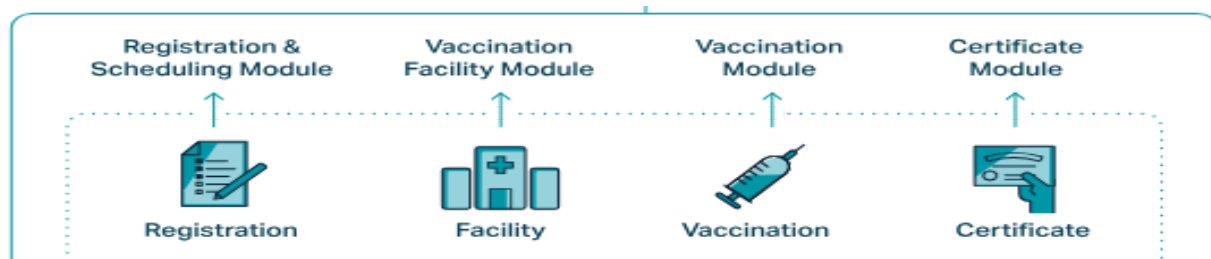
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1. Introduction

1.1 Scope

During the COVID - 19 pandemic, for most countries large scale vaccinations was a worrisome project. Vaccines were manufactured and consumed immediately and hence it was critical to maintain the logs. Reaching out to people and aid for vaccinations was necessary to provide vaccines to the entire nation. It was crucial to develop a portal which can help citizens to book slots for their vaccines and download their certificates if and when they are vaccinated. Portal was necessary for the government to keep tabs on the number of vaccines consumed, number of citizens vaccinated and number of doses taken by the citizen. COVID - 19 portal serves the functionality of registration, appointment scheduling, identity verification, vaccination, and certificates of each vaccinated community member. This portal can be used by anyone who has aadhar card or Passport of this nation and offers all types of vaccines in private and public hospitals. One might face difficulty if their KYC or contact number is not updated in Aadhar card or passport.



1.2 Objective Statement

- To provide vaccines to all people residing in India.
- To reduce the pressure on the healthcare system by booking the slot beforehand and avoiding overcrowding.
- To allow members to choose between the local government civic centers and private hospitals.
- To allow members to maintain systematic record of each individual of the family and access their history when needed
- To periodically survey the consumption of vaccines.
- To maximize vaccination coverage.
- To reduce overall COVID - 19 mortality rate by making sure all the residents are vaccinated.
- To eliminate the disease.

2. Problem Statement

- To allow multiple slot booking.
- To make sure a person is not vaccinated more than required times.
- To make sure of the proper interval of time before taking the second dose.
- To find the data of the entire family at one place.
- To allow users to download the certificate when needed.
- To allow users to have access to dates of when they were vaccinated.
- To increase privacy and security by two-factor authentication.

3. Functional Requirements

3.1 Login/Registration module

The system provides a mechanism for users to authenticate themselves using mobile numbers or emails. An OTP is sent to the entered mobile number and is used to log into the system. If the OTP is not received within 90 seconds of the request, the user can request a new OTP. It is mandatory to have an Indian mobile number for login.

3.2 Dashboard

Upon successful login, the user will be redirected to the dashboard, which includes several modules such as "Add Member," "Slot Booking," and "View Certificate." Additionally, it provides options for "Help" and "Logout."

3.3 Add member

In this family-friendly portal, all members can track their vaccination status in one platform. To add a family member, the user should first select the nationality of the family member. If the family member is Indian, the Aadhar card number is mandatory, and all essential details are fetched from it. Users need not manually enter the details once they've provided their Aadhar card number. To ensure correctness, an OTP is sent to the mobile number linked to the Aadhar card for authentication after entering the Aadhar card number.

Similarly, if the user chooses the nationality of the family member as NRI, they are asked to provide their passport number for authentication. The same OTP authentication process is repeated. Once all the details are verified, the family member is added to the user's account.

3.4 Book Slot

The system provides the facility to book slots for multiple family members all at once. If the family member is Indian, they have the liberty to choose between private hospitals and government hospitals as per their choice. However, NRIs can only book slots in private hospitals and are directed to the respective website. If the user has already taken the first shot, they need to wait for a predefined amount of time before booking a slot for the second dose.

Additionally, the system ensures that both slots are booked for the same vaccine.

3.5 View Certificate

Users and their family members can download the vaccine certificates from this section. A zip file containing the vaccination certificates of all the selected family members is downloaded.

4. Non-Functional Requirements

4.1 Performance

Performance requirements ensure that the system functions efficiently. In the context of your portal, it means that users should experience quick response times when performing actions like logging in, booking a slot, or viewing certificates. The system should be optimized to handle a large number of concurrent users without significant degradation in response times, especially during peak vaccination periods.

4.2 Scalability

Scalability ensures that your portal can accommodate increased user loads as demand grows over time. This is crucial as vaccination campaigns may see fluctuating participation. The system should be designed to scale horizontally by adding more servers or resources to handle increased traffic. Scalability should be both vertical (increasing resources on a single server) and horizontal (adding more servers to the cluster) to adapt to varying workloads.

4.3 Security

Security is paramount to protect users' sensitive data and maintain the integrity of the vaccination process. User data, including personal and medical information, should be encrypted and securely stored. Access control mechanisms should be in place to ensure that only authorized personnel can modify or access critical system components and data.

4.4 Reliability

Reliability guarantees that the system operates consistently and is available when needed. For a vaccination portal, reliability is crucial as it deals with public health data. The system should have redundancy and failover mechanisms to ensure continued operation even in the face of hardware or software failures. Regular backups and data integrity checks should be implemented to prevent data loss, and an effective error handling and logging system should be in place to facilitate rapid issue resolution.

4.5 Portability

The system is easily adaptable and functional across various platforms and devices, ensuring a seamless user experience regardless of the device or operating system. Users are able to access the portal using desktops, laptops, tablets, and smartphones, regardless of the operating system (e.g., Windows, macOS, Android, iOS), ensuring widespread accessibility and usability.

4.6 Compliance to Government Rules

The system adheres to the specific regulations and guidelines set forth by government authorities related to data privacy, security, and handling of medical information. The platform complies with local and international laws and standards i.e IMC rules, and any specific guidelines issued by health and governmental bodies, ensuring legal and ethical operation.

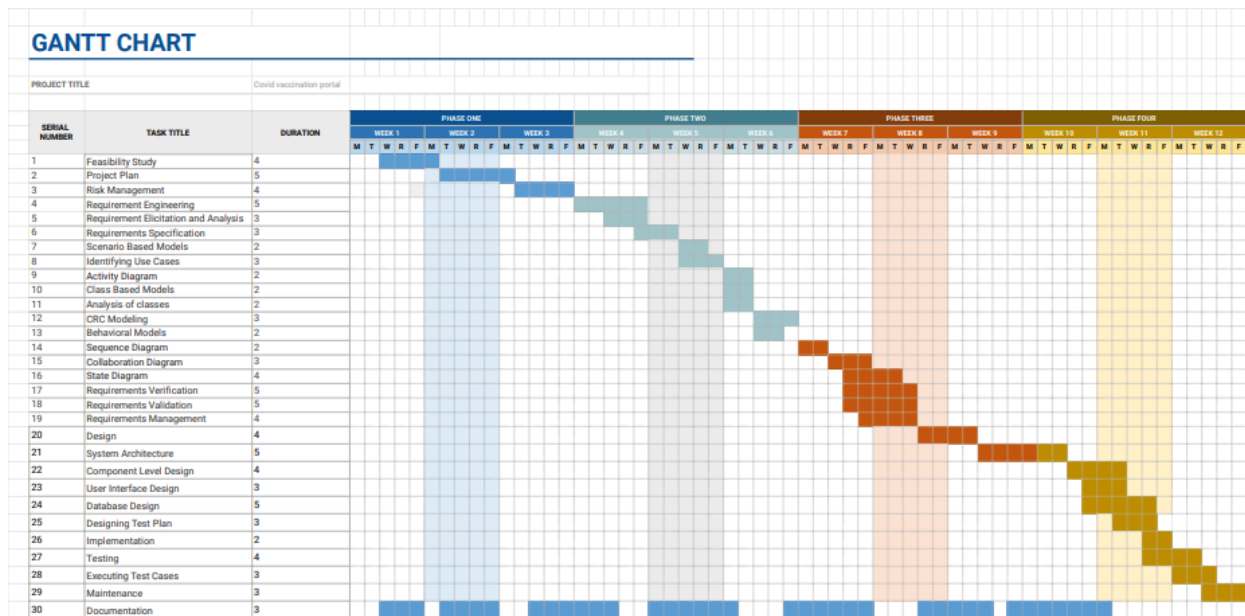
4.7 Capacity

The system is able to handle a predetermined amount of load and data within acceptable performance parameters, ensuring efficient processing and response times even during peak usage periods. The portal supports a scalable number of users simultaneously, managing a significant volume of data, logins, registrations, and slot bookings without experiencing degradation in system performance. Capacity is necessary because vaccines will be taken by each and every citizen and eventually the load on the system will increase and the system should be able to cope with it.

4.8 Availability

The system is accessible and operational at all times, with minimal downtime, ensuring users can use the platform whenever needed. The portal should strive for high availability, minimizing maintenance windows and scheduled downtimes, to provide users uninterrupted access to essential features like login, booking slots, and viewing certificates. Certificates are essential and mandatory for boarding a flight or any such thing. At all these instances, handy and accessibility plays an important role and allows users to use them.

5. Gantt Chart



6. Use-Case Diagram

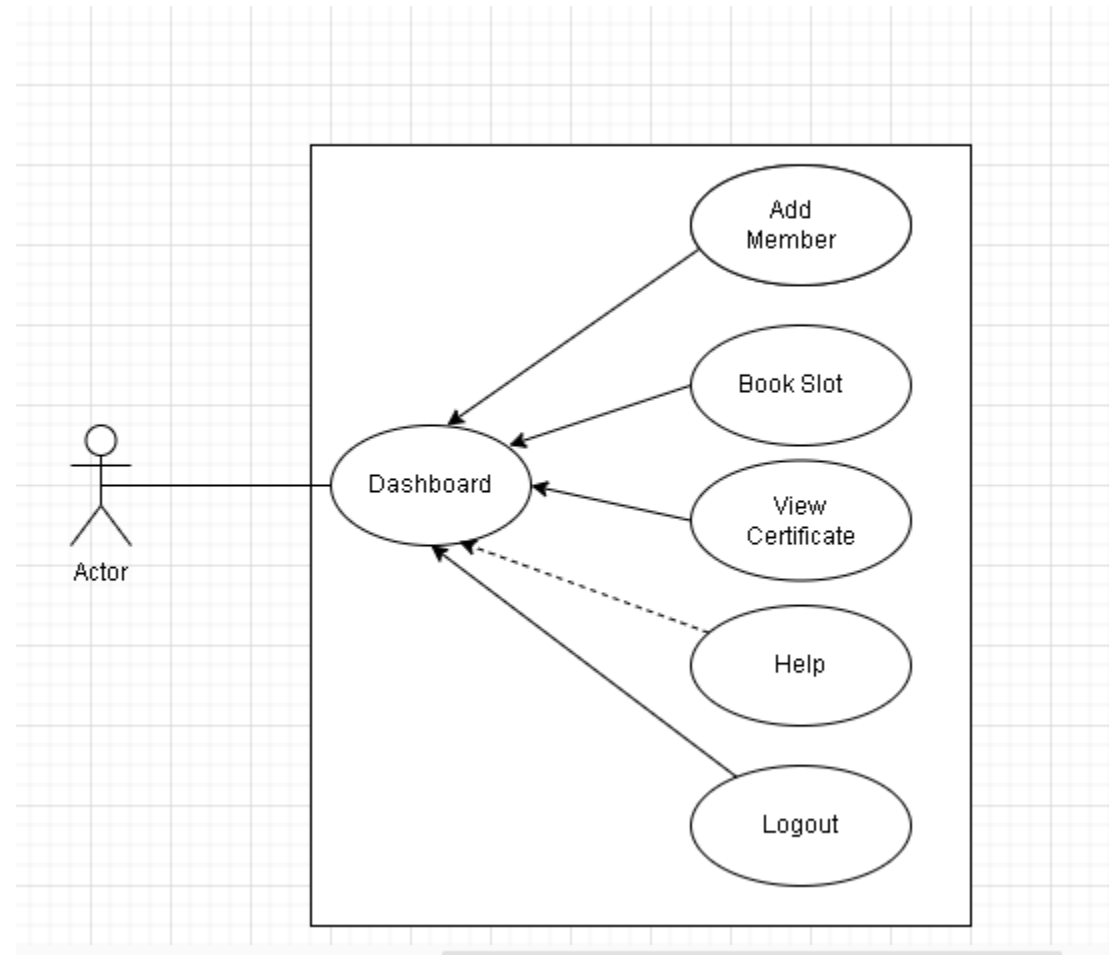
6.1 Module 1

REGISTER/LOGIN :-

MODULE 1: REGISTER/LOGIN	
Pre-condition	User should have registered mobile number
Post-condition	Directed to dashboard
Basic path	<ol style="list-style-type: none"> 1. Citizen should enter valid phone number 2. OTP will be sent to entered phone number 3. On providing the OTP, confirmation will be provided from the admin and user will be directed to dashboard
Alternative path	If the user doesn't have a phone number or has any issues then the user can authenticate using email ID.
Exceptional path	-

6.2 Module 2

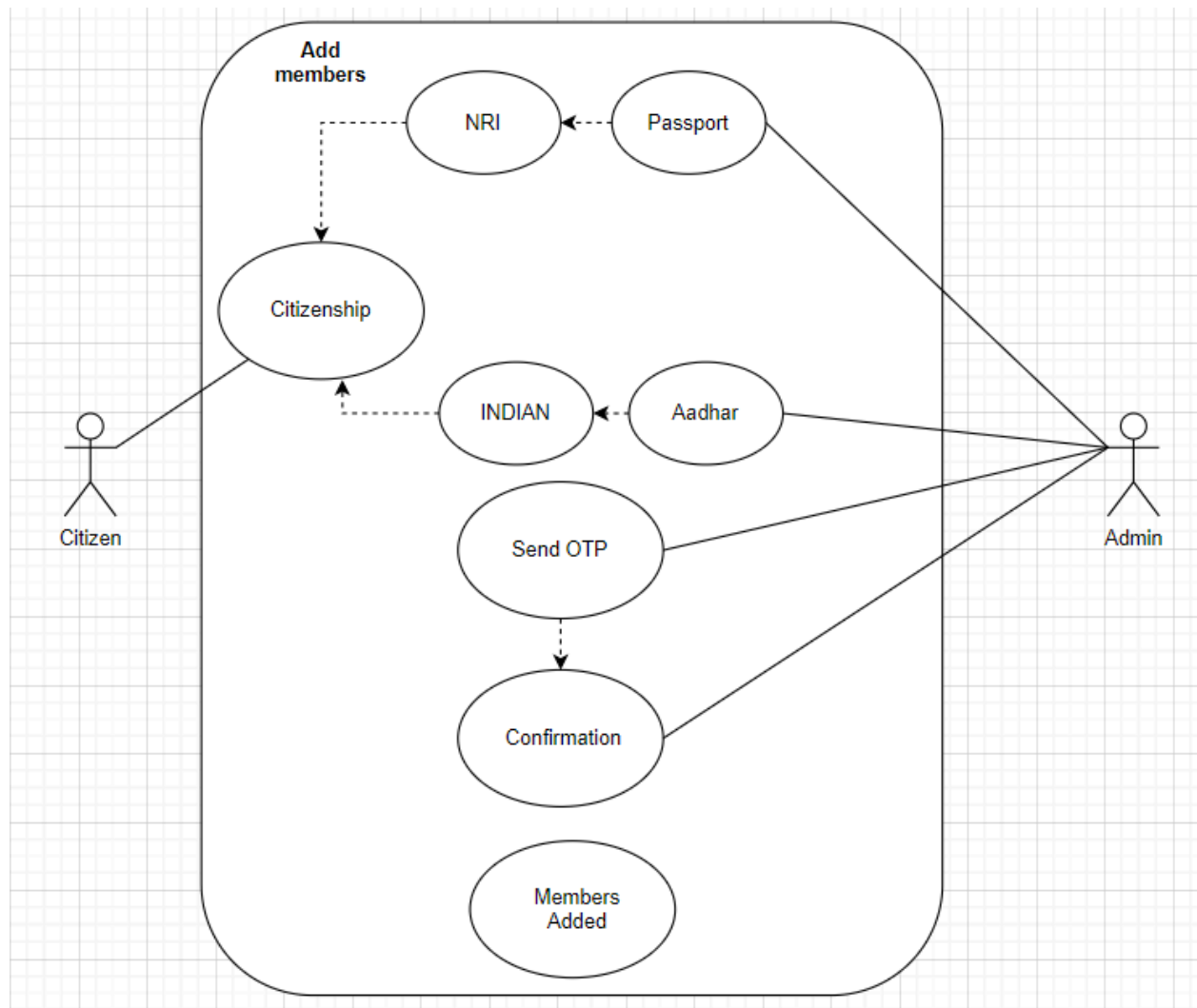
DASHBOARD :-



MODULE 2: DASHBOARD	
Pre-condition	Log-in
Post-condition	-
Basic path	Users/Actors can choose from either of the modules: Add member, Book Slot, View Certificate, Help and Logout. Help extends the dashboard.
Alternative path	-
Exceptional path	-

6.3 Module 3

ADD MEMBER :-

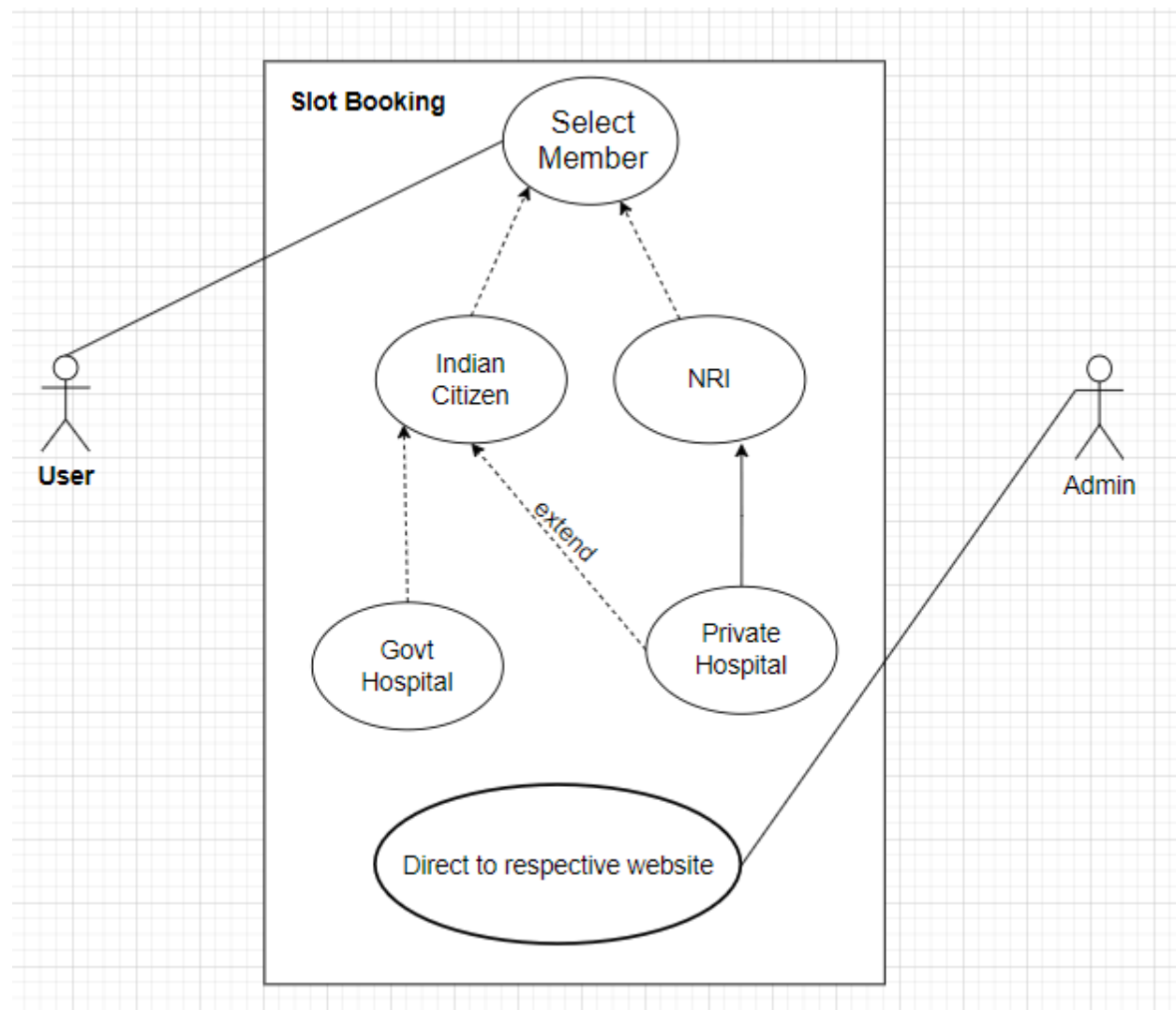


MODULE 3: ADD MEMBER	
Pre-condition	Correct log-in credentials
Post-condition	-
Basic path	<ol style="list-style-type: none">1. Select the citizenship of the customer.2. If Indian, then it should enter its aadhar card number for verification.3. If NRI, then it should enter its passport number for verification.4. On confirming OTP, members will be added.

Alternative path	If the phone number is not reachable then email ID can also be used.
Exceptional path	-

6.4 Module 4

BOOK SLOT :-

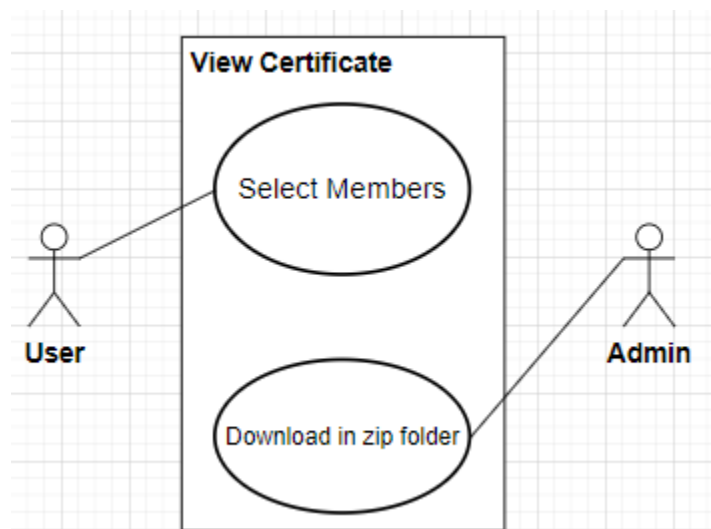


MODULE 4: BOOK SLOT	
Pre-condition	Login and more than one member should be added.
Post-condition	-

Basic path	<ol style="list-style-type: none"> 1. Members that want to be vaccinated should be selected. 2. If NRI then it can take its vaccine in private organizations only. 3. Indians have the option of choosing between government hospitals and private hospitals. 4. On selecting the hospital customer will be redirected to the respective website.
Alternative path	-
Exceptional path	-

6.5 Module 5

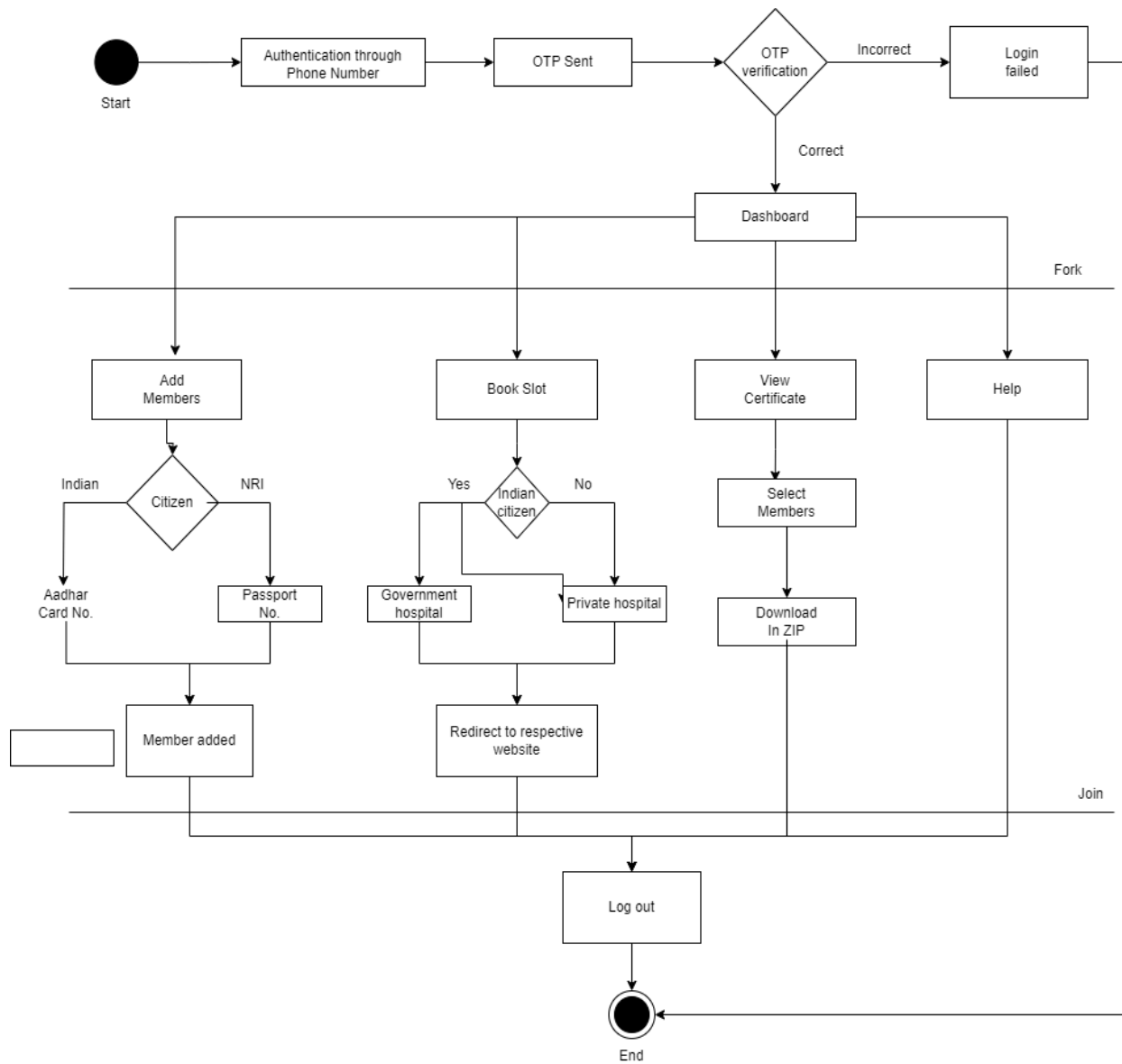
VIEW CERTIFICATE :-



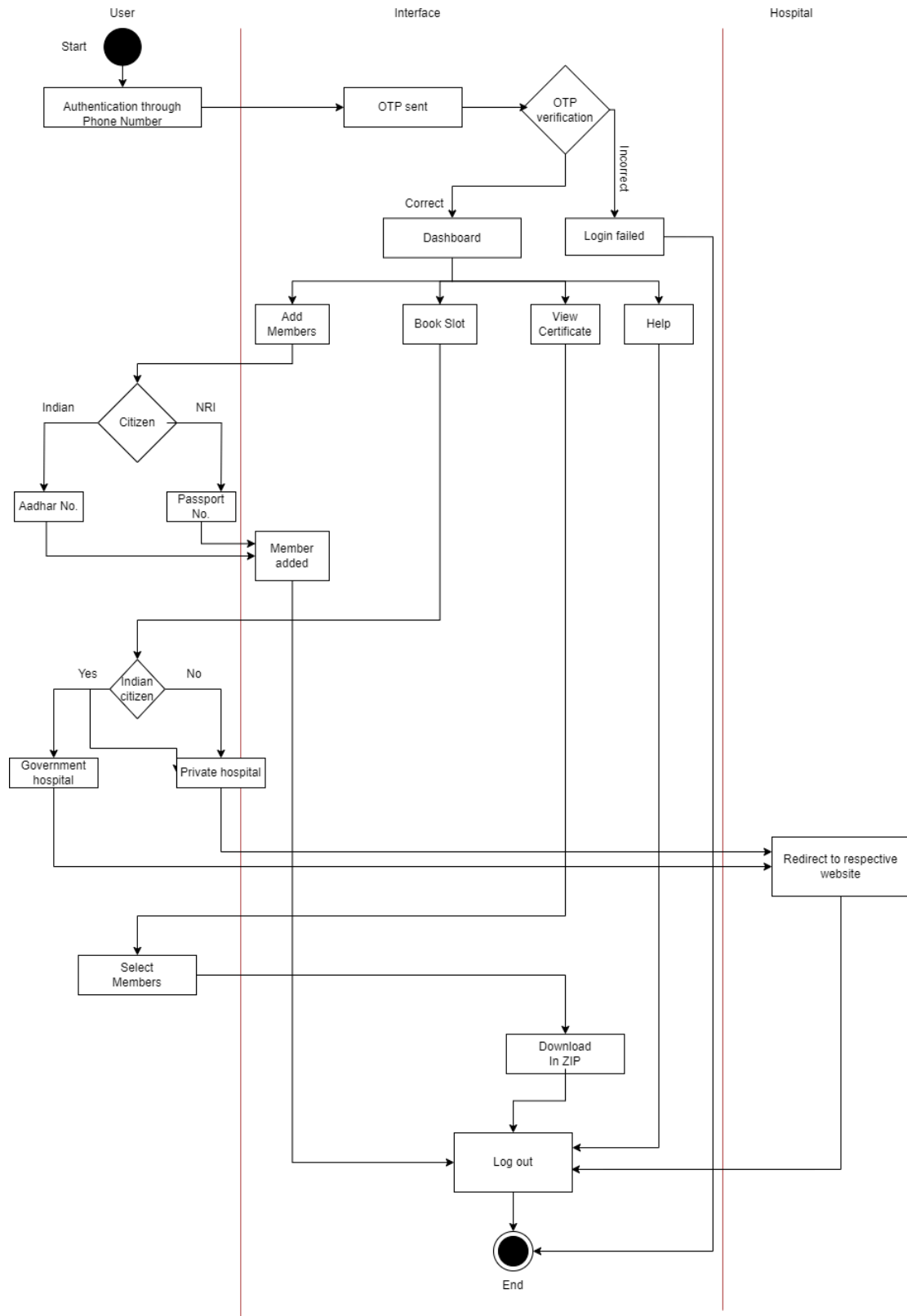
MODULE 5: VIEW CERTIFICATE	
Pre-condition	Login, more than one member and member should be vaccinated, system should support pdf files and zip files and system should have permission to download documents.
Post-condition	Official certificates can be generated.
Basic path	<ol style="list-style-type: none"> 1. Select members whose certificate you wish to download. 2. Zip file with pdf files of certificates will be downloaded.
Alternative path	-

Exceptional path	-
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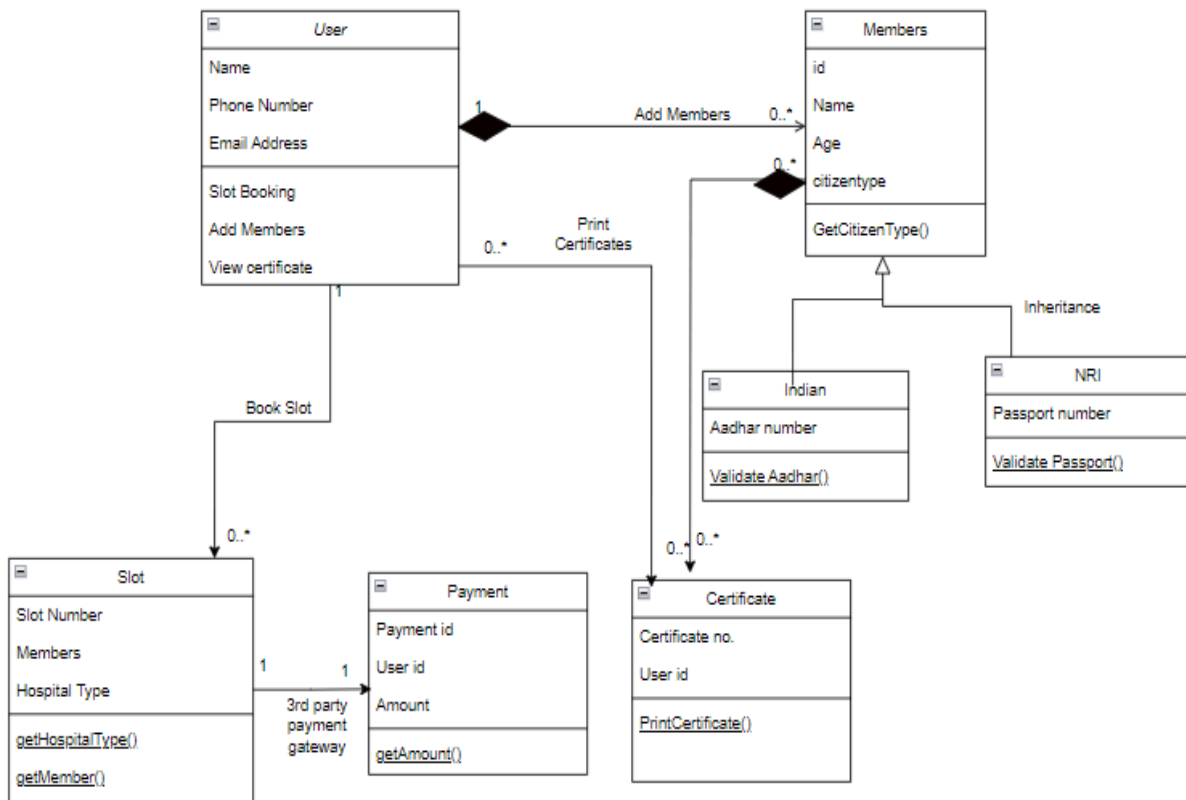
7. Activity Diagram



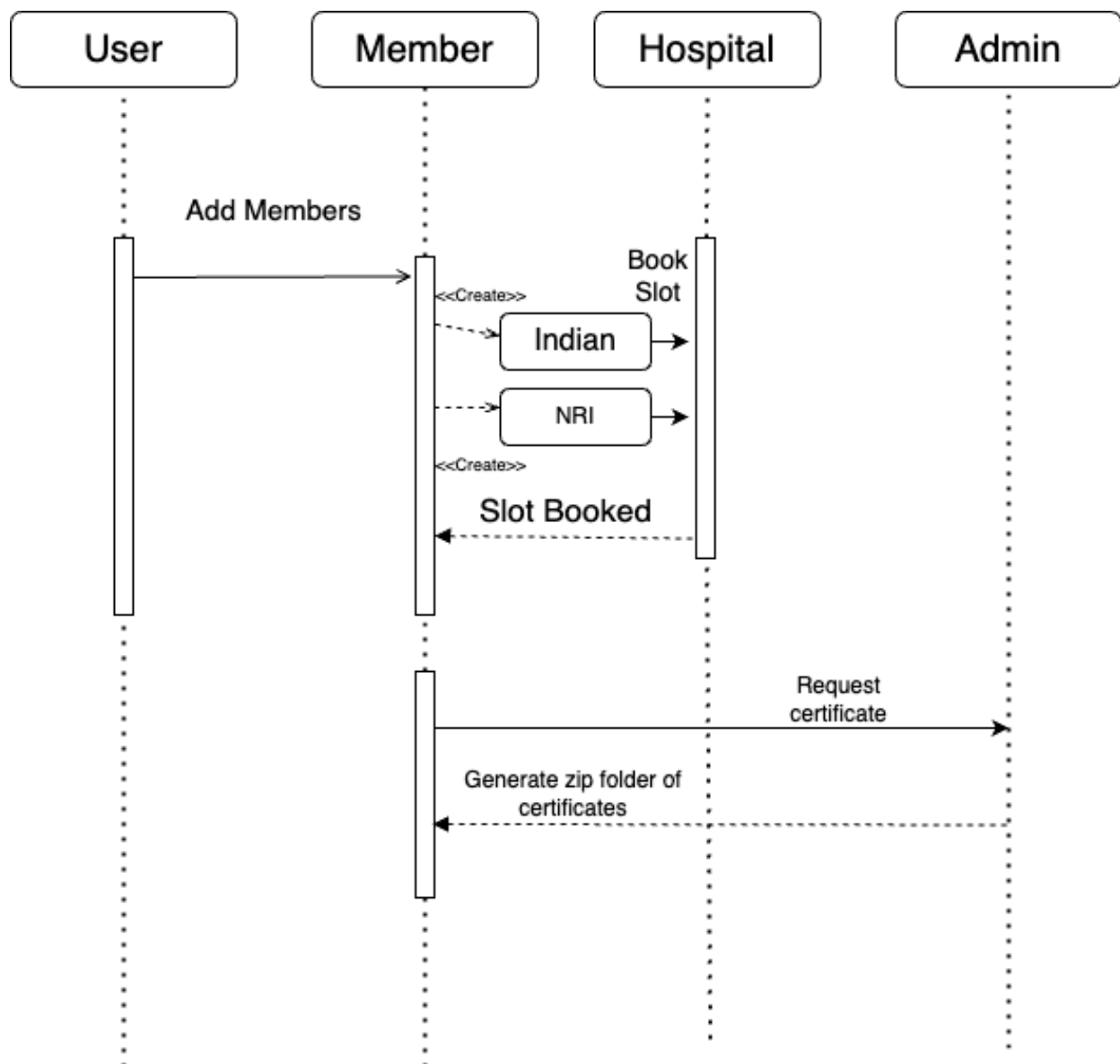
7.1 Swimlane Activity Diagram



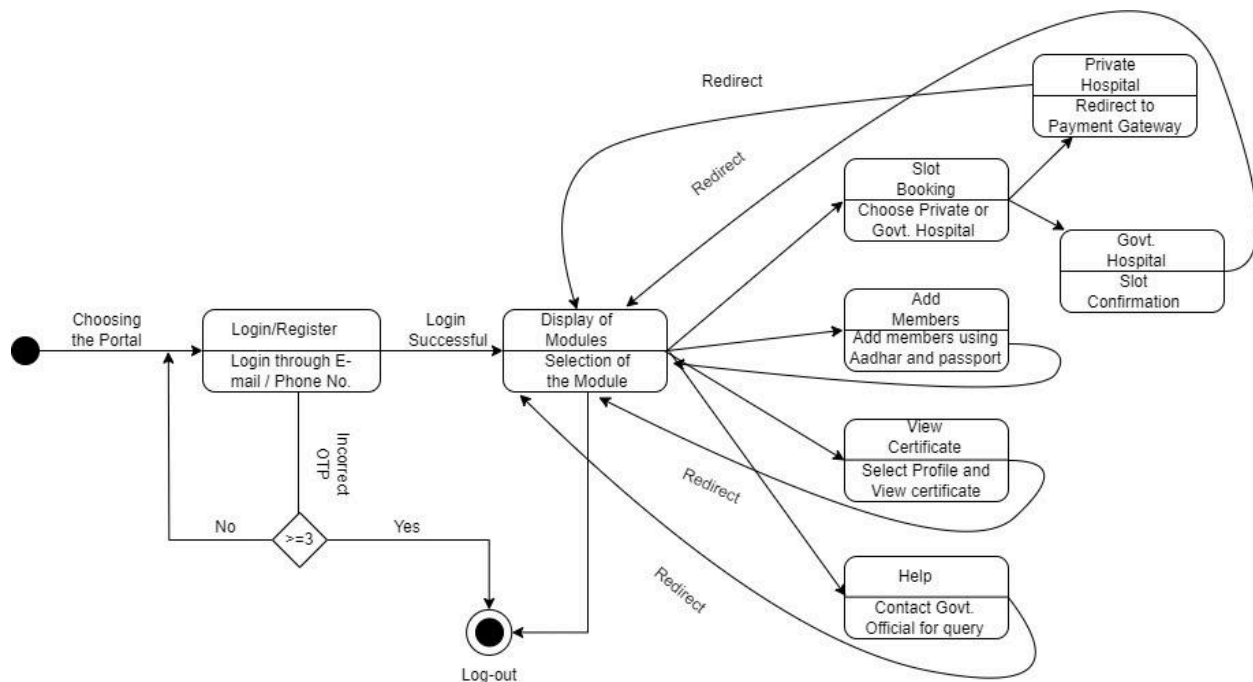
8. Class Diagram



9. Sequence Diagram



10. State Diagram



11. Z-notation

FR 1:

$(User \times (MobileNumber \cup Email)) \times Time \rightarrow OTP$

To get OTP one needs to enter username and mobile number or email address and OTP should be received in a certain amount of time.

$isIndianMobileNumber : MobileNumber \rightarrow Boolean$

Only indian numbers are allowed

FR 2:

Dashboard = {"Add Member", "Slot Booking", "View Certificate", "Help", "Logout"}

Options = {"Help", "Logout"}

Dashboard = Modules + Options

FR 3:

If (nationality == NRI) -> PassportNumber

If (nationality == Indian) -> AadharCardNumber

FR 4:

$H(F) = \{\text{"Private" or "Government"}\}$ if $N(F) = \text{"Indian"}$

$H(F) = \{\text{"Private"}\}$ if $N(F) = \text{"NRI"}$

Waiting Period ≥ 3 months

FR 5:

Download_Certificates(User, F) \rightarrow Zip_File (F represents set of selected family members)

12. Unit Testing