Title of the Project: Vaccination Management System

Group Number: 1

Group Members:

Student ID	Student Name
20101017	Md. Hasin Sarwar Ifty
20101020	Nisharga Nirjan
20101039	Labib Islam

Introduction:

Greetings from Group-1 of CSE471! Our team has three members, namingly Md. Hasin Sarwar Ifty, Labib Islam and Nisharga Nirjan. The project we have worked on is titled "Vaccination Management System". The project features a system where individual users can request for vaccinations. This vaccination request is realized via a vaccination slip as well forwarding the request to the selected hospital. We implemented the project as a website system. The frontend of our project is implemented using HTML, CSS and JavaScript. On the other hand, the core backend is handled using PHP and JavaScript. Furthermore, we used MySQL(MariaDB) as the DBMS for our project.

Motivation:

The genuine reason behind initiating this project was the poor countermeasures that were being applied to tackle the COVID-19 scenario in this country. The general people were not getting vaccines at a certain hospital at a certain time as per their wish. It was all being controlled by a system with no user preference which was putting the people in a lot of dilemma as their personal & professional life was being compromised for this. So, that's when we thought of creating a system which can provide the vaccines to the people as per their preference without inflicting upon their daily life activities. We initially started this project based on COVID-19 vaccines only but along the way, we thought of adding Non-COVID vaccines to our system too to contribute to a broader audience. Although our project has a lot of flaws, we intend to fix them as soon as possible so that it can be implemented practically and users can use the system smoothly.

Implementation:

As our project is a Vaccination Management System, the implementation of this project requires a few crucial things. First and foremost of it would be the approval of the government for using the National Database for NID, or at least a portion of it. Secondly, we need to formulate a contract that is not only beneficial to us, but also for the hospital itself and the potential consumers of the system. Thirdly, the project needs a few onsite coordinators at the affiliated hospitals for some periodic monitoring and as a means of emergency communication with the offsite employees. Fourthly, we need at least two sets of offsite employees across 12 hour periods to constantly monitor the system itself. Lastly, we need a few more developers to work alongside our project for fine tuning the key aspects of the project as well as for the purpose of debugging.

System Request - Vaccination Management System

Project Sponsor: Vincent Chang, Vice-Chancellor, BRAC University.

Business Need: Using the proposed system, the users will be able to easily request and confirm their vaccines of a certain hospital and date as per their choice. Moreover, the hospitals in contract with the system will be able to provide users with vaccines in an organized yet swift manner which will attract more users. As a result, more hospitals will be eager to enter a contract with our system such that they can also forgo all the unnecessary campaigning of certain vaccines or diseases and use a clean. centralized system.

Business Requirements:

- Users/Patients can utilize the drop down menu to choose and request the vaccine of their choice.
- Users/Patients can also choose the hospital and date of their convenience to take the vaccine.
- Admins can manage availability of hospital, date, vaccination and add new hospital and vaccines to the system.
- Admins will be notified by the system whenever the availability of certain vaccines becomes minimal and need to be restocked.
- Admins can view the status and all the previous records of a user/patient.
- OTP system for secure login or signup.
- Admin can only view the patient data, and not be able tamper with said data.
- The system is only limited to affiliated or contracted hospitals and their vaccine supply.
- The system will follow the regulations set by the Health Ministry of Bangladesh.

Business Value:

- Tangible Values:
    - Roughly 50% reduction in management employees cost [6 admins→150,000 TK/month(appx.) VS minimum 10 employees on each department: registration, hospital database management, inventory maintenance→300,000 TK/month(appx.)]
    - Around 400,000 TK/month for vaccines sold [average vaccine price=1400 TK→3% of every vaccine=42 TK→for 10 hospitals and 1000 vaccines/month, 10000 vaccines/month sold→ 10,000 * 42=420,000 TK revenue/month(appx.) for all the vaccines sold]

    - Around 90,000 TK/month as Ad revenue from the website. [Minimum $1000 = TK. 93,138.58 (Conversion rate $1=TK. 93.14) per month from Google Ad Network].
- Intangible Values:
    - Increased popularity of the system due to ease of access of users.
    - Seasonal vaccine prompts ensure a steady supply of patients.
    - Proper time management of employees ensures a healthy employee base.
    - Work from a home environment created for employees.

Special Issues or Constraints:

- Severe background checks must be done on the hospitals in contract as well as the inventory they are providing to ensure that users get authentic doses maintaining the legal boundaries so that the system does not become responsible. This creates a factor of risk in the system which can, at most, nullify the credibility of the system.
- Approval from the Health Ministry needs to be ensured and maintained to act as an intermediary between the hospitals and users. This can make the productivity of the system vary due to new regulations applied by the Ministry frequently as well as handover of power in the Ministry once in a while.
- Servers running the system must be constantly monitored for recording and predicting the user traffic such that it does not cross our upper limit for concurrent users of the server. This prediction can still be flawed due to human error which can crash the system due to high spike of requests or add unnecessary cost on massive resources of servers when the user spike is low.

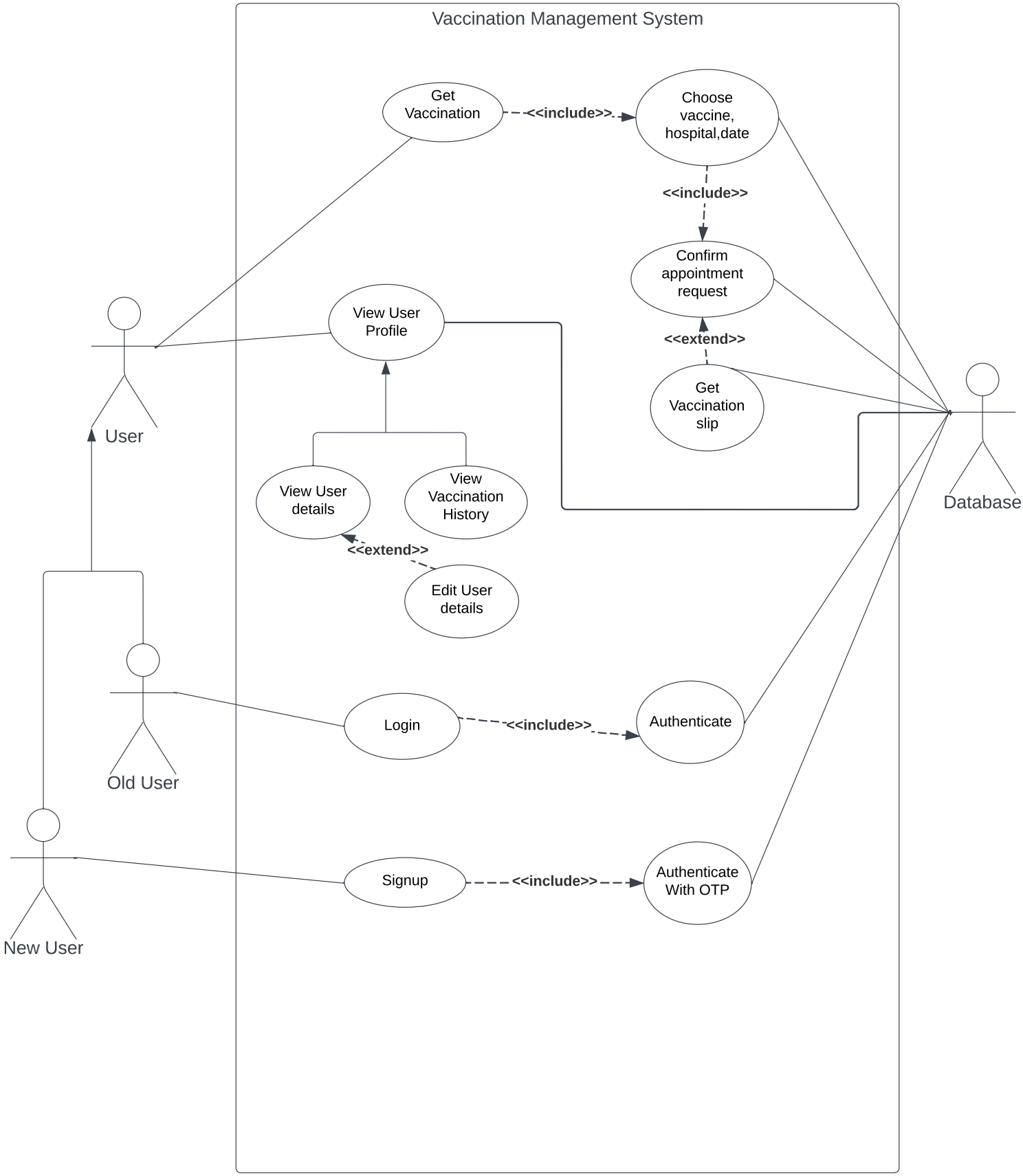
Requirement Analysis:

- Functional Requirements:
    1. Signup/Login:
        1.1. Users can create an account providing their full name, date of birth, Birth Certificate ID/ NID and contact number using the signup option.
        1.2. Users cannot login if they are not already signed up in the system.
        1.3. OTP system for secured login or signup.
    2. Vaccination Request:
        2.1. Users can choose their preferred available vaccine of a certain hospital at a certain date by clicking on drop down menus for each section.
        2.2. If a vaccine request is confirmed, an alert will pop up. Otherwise, a different alert will pop up and the user will have to request again.

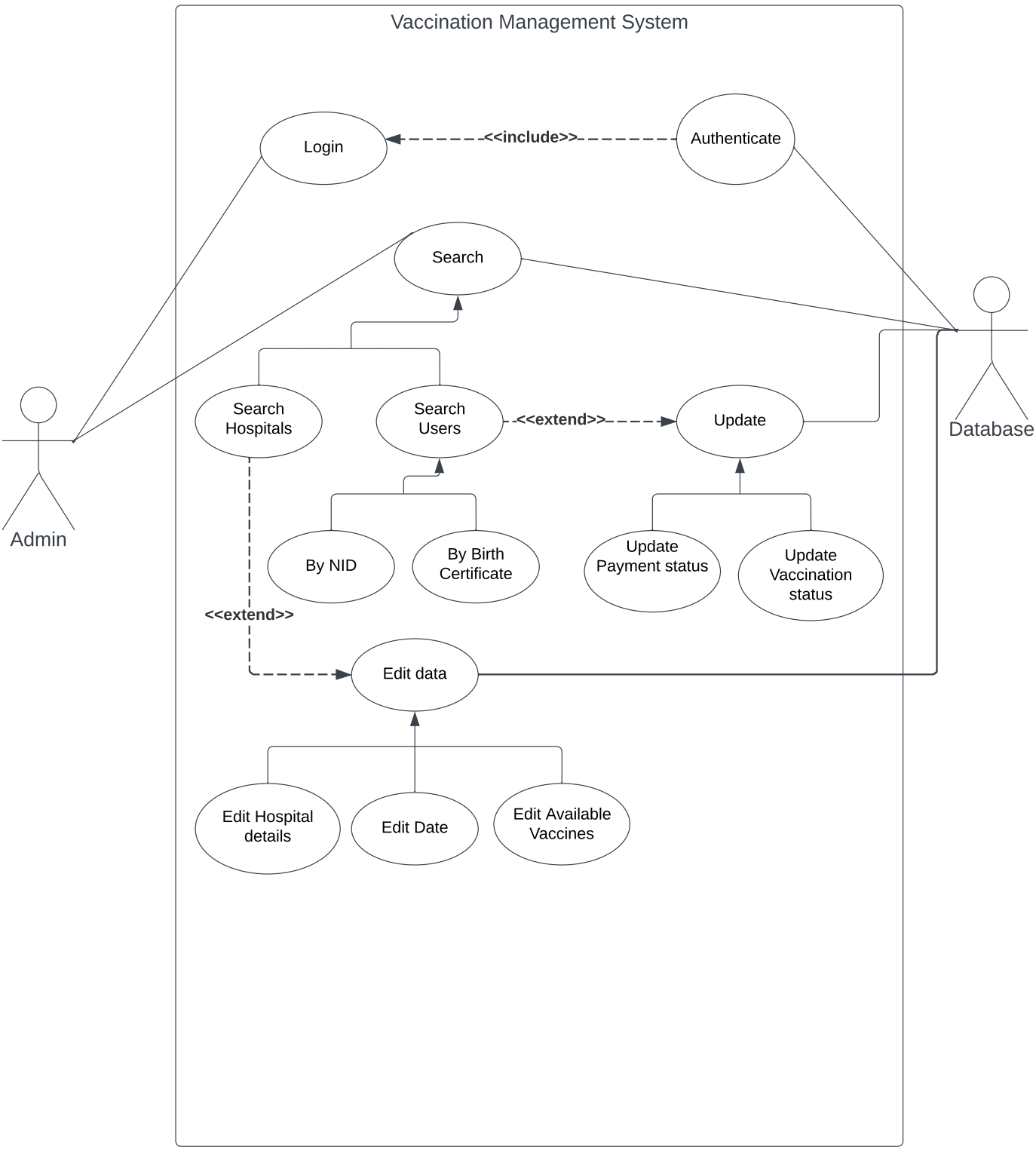
3. User Information:
    3.1. Users will be able to check their general information and will be able to change most of them.
    3.2. Users will be able to check on their previous records of doses as well as the vaccination status and payment status.
4. System Management:
    4.1. Admins can manage the availability of hospitals, dates and vaccinations in the system.
    4.2. Admins can add new hospitals or vaccination to the system and can also delete an existing hospital or vaccination from the system.
    4.3. Admins will be notified by the system whenever the availability of certain vaccines becomes minimal and needs to be restocked.
    4.4. Admins can view all the previous records of a user/patient and can update their vaccination and payment status.
    4.5. Admins will have a search bar option to search for specific hospitals in the system.
    4.6. Admin can also search for a specific user by Birth Certificate ID/ NID number.

- Non-functional Requirements:
    1. Operational:
        1.1. The system should have a similar UI for all forms of platforms e.g. phone, desktops, tablet PCs etc.
        1.2. The system should be accessible from any web browser.
    2. Performance:
        2.1. The system should be available 24/7, 365 days a year.
        2.2. The system should be able to handle a sufficiently high number of concurrent users.
        2.3. Interaction between the user and the system should be sufficiently fast.
        2.4. Any updates regarding the database should be handled rapidly.
    3. Security:
        3.1. Admin can only view the patient data, and not be able tamper with said data.
        3.2. Admins will be able to update hospital inventory data, and thus this action of theirs will need to be monitored.
        3.3. Information provided by the users (mainly: NID) will be encrypted i.e. secured in the database.
    4. Cultural & Political:
        4.1. The system is only limited to affiliated or contracted hospitals and their vaccine supply.
        4.2. The system will not have any priority basis for vaccination following the National Health Policy 2011.

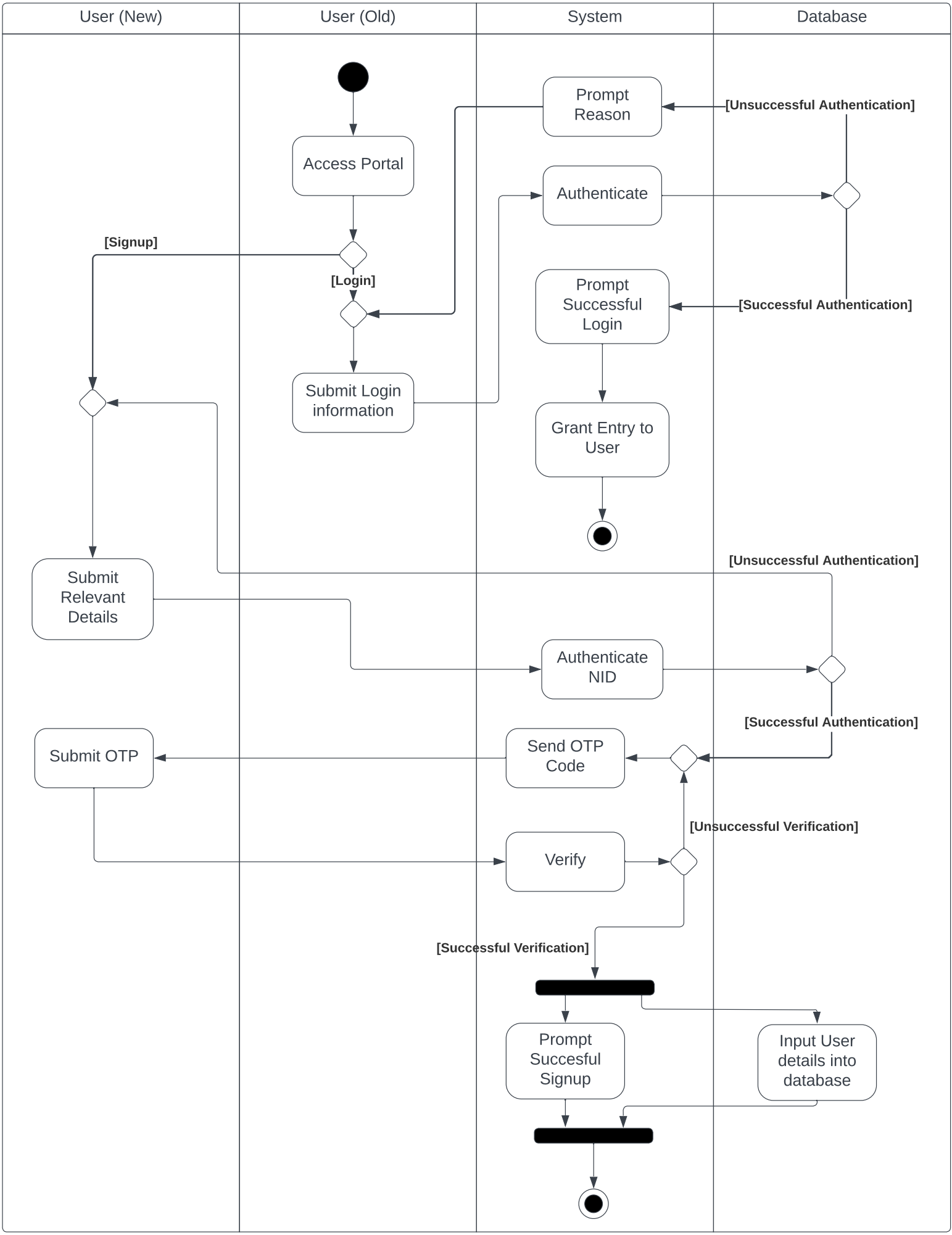
User Case Diagram (User)



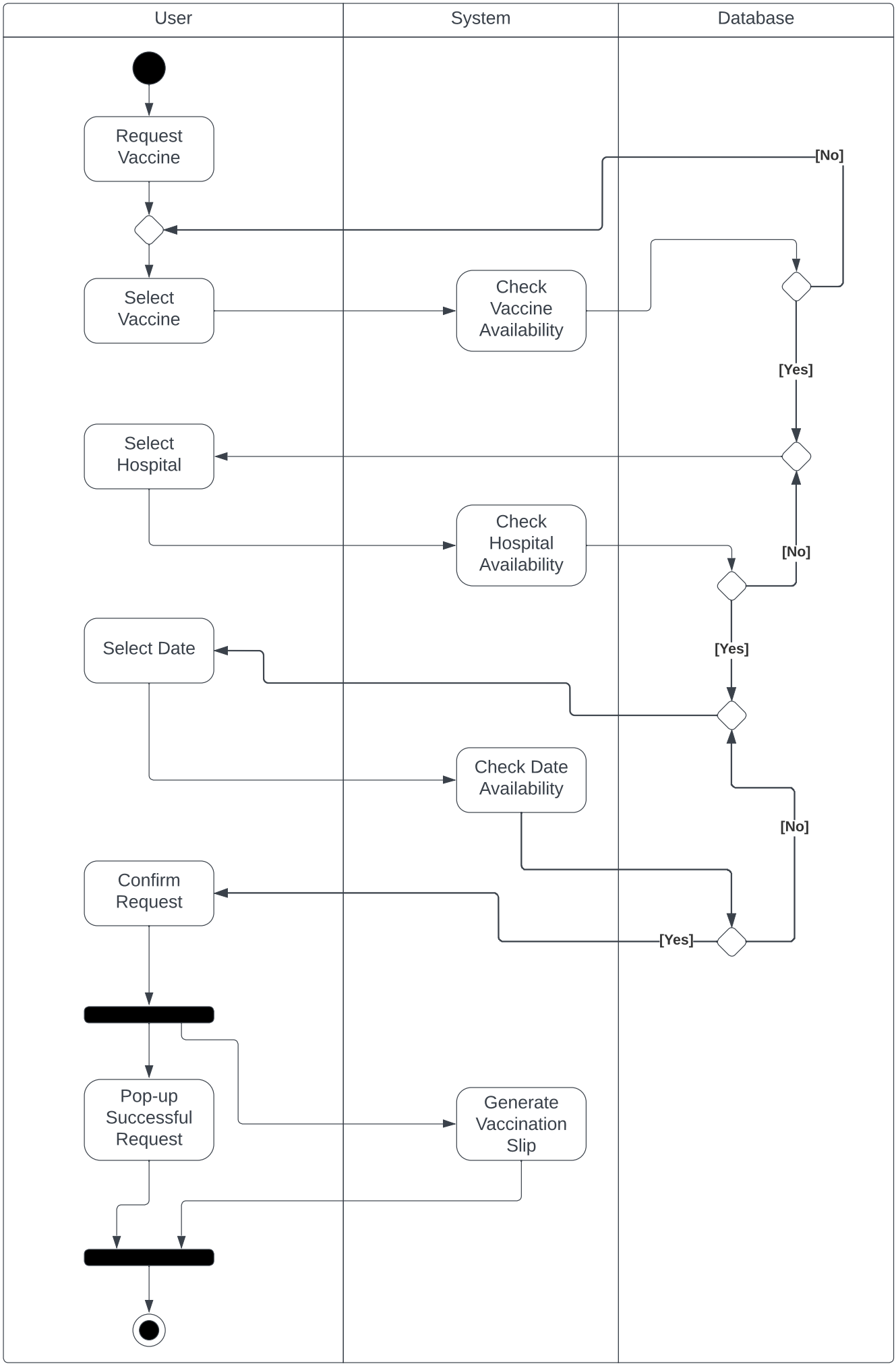
User Case Diagram (Admin)



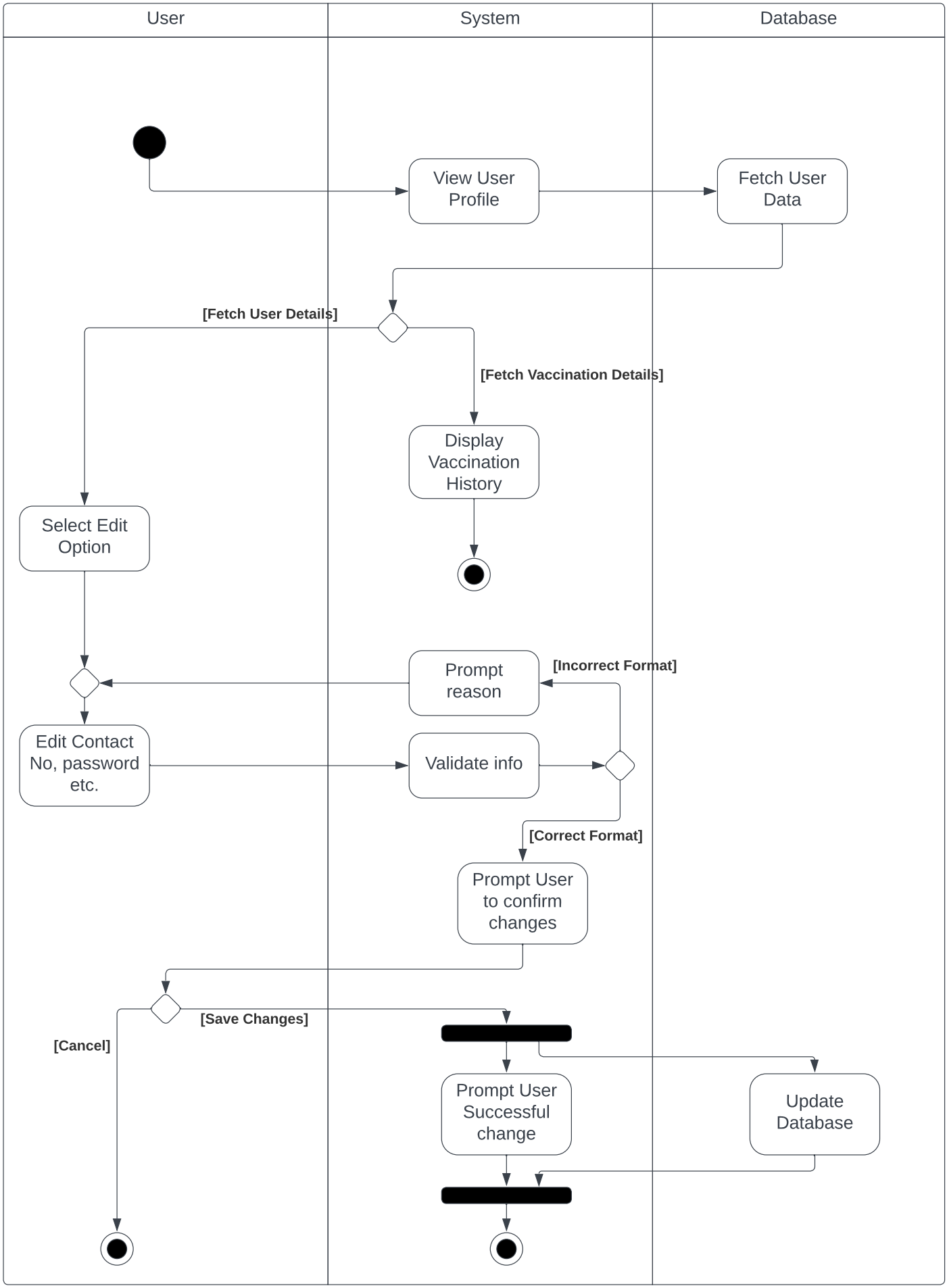
Activity Diagram for User Login System



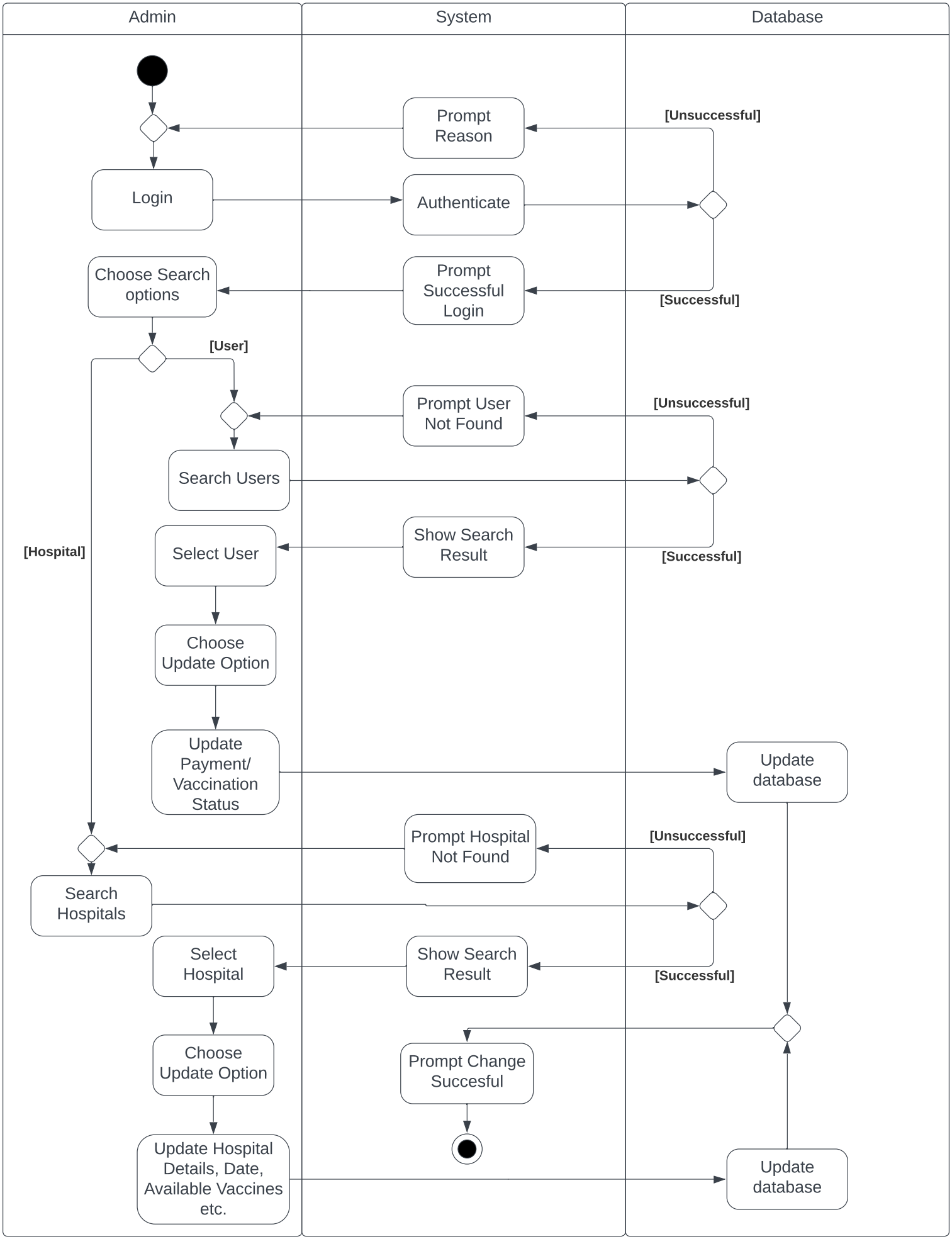
Activity Diagram for Vaccination Request by User



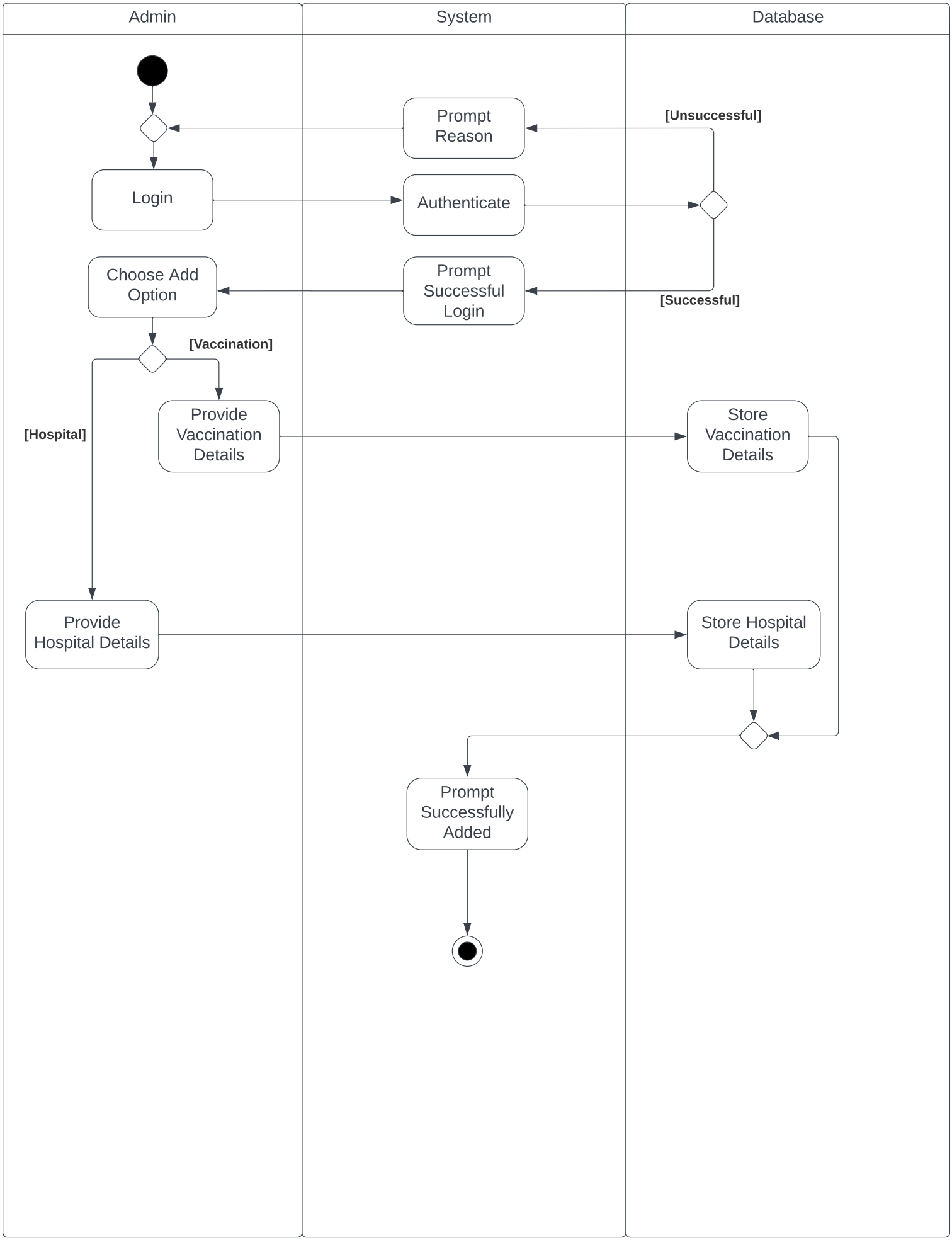
Activity Diagram for User Profile Viewing & Updating

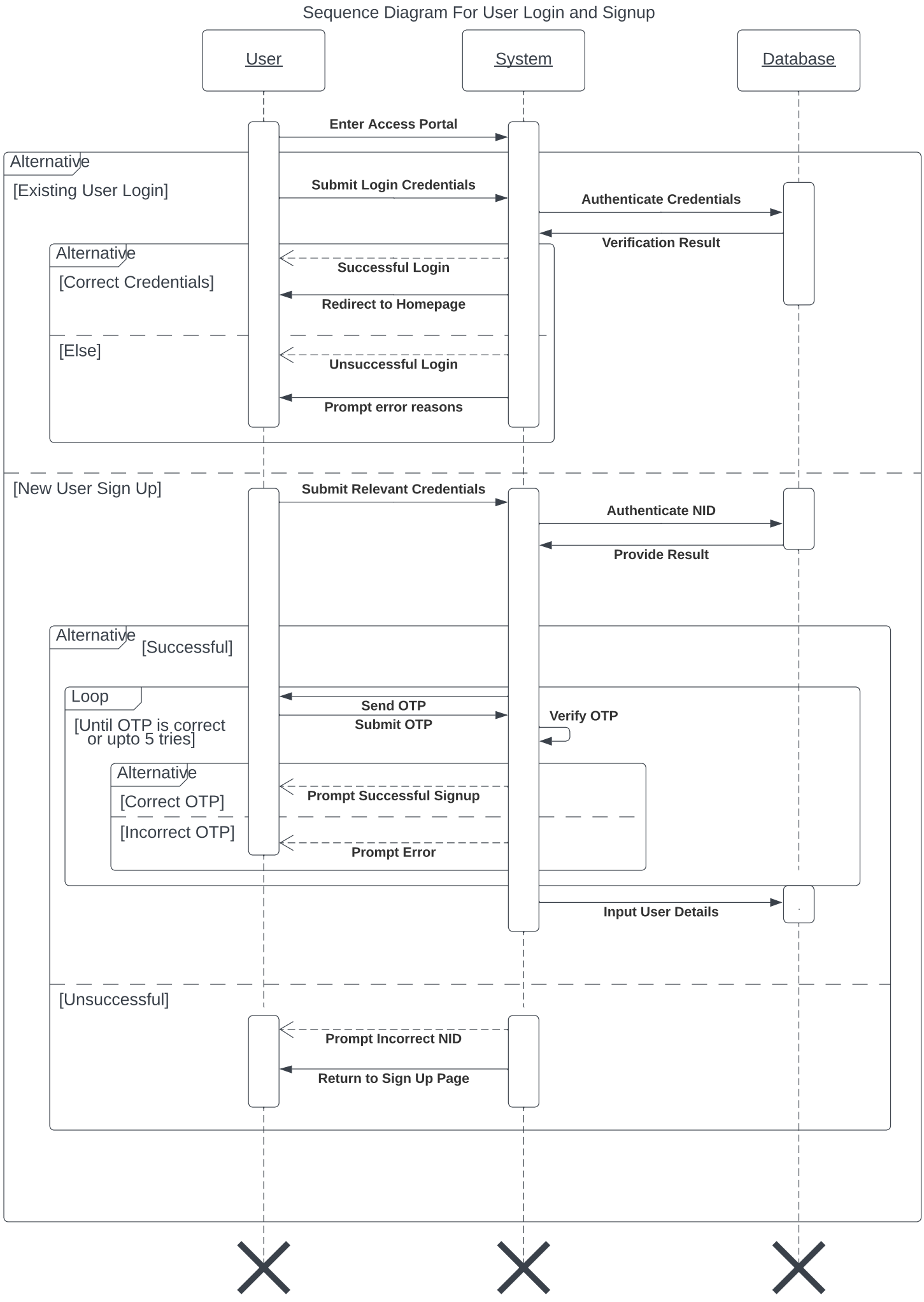


Activity Diagram for Admin Search Option & Updating

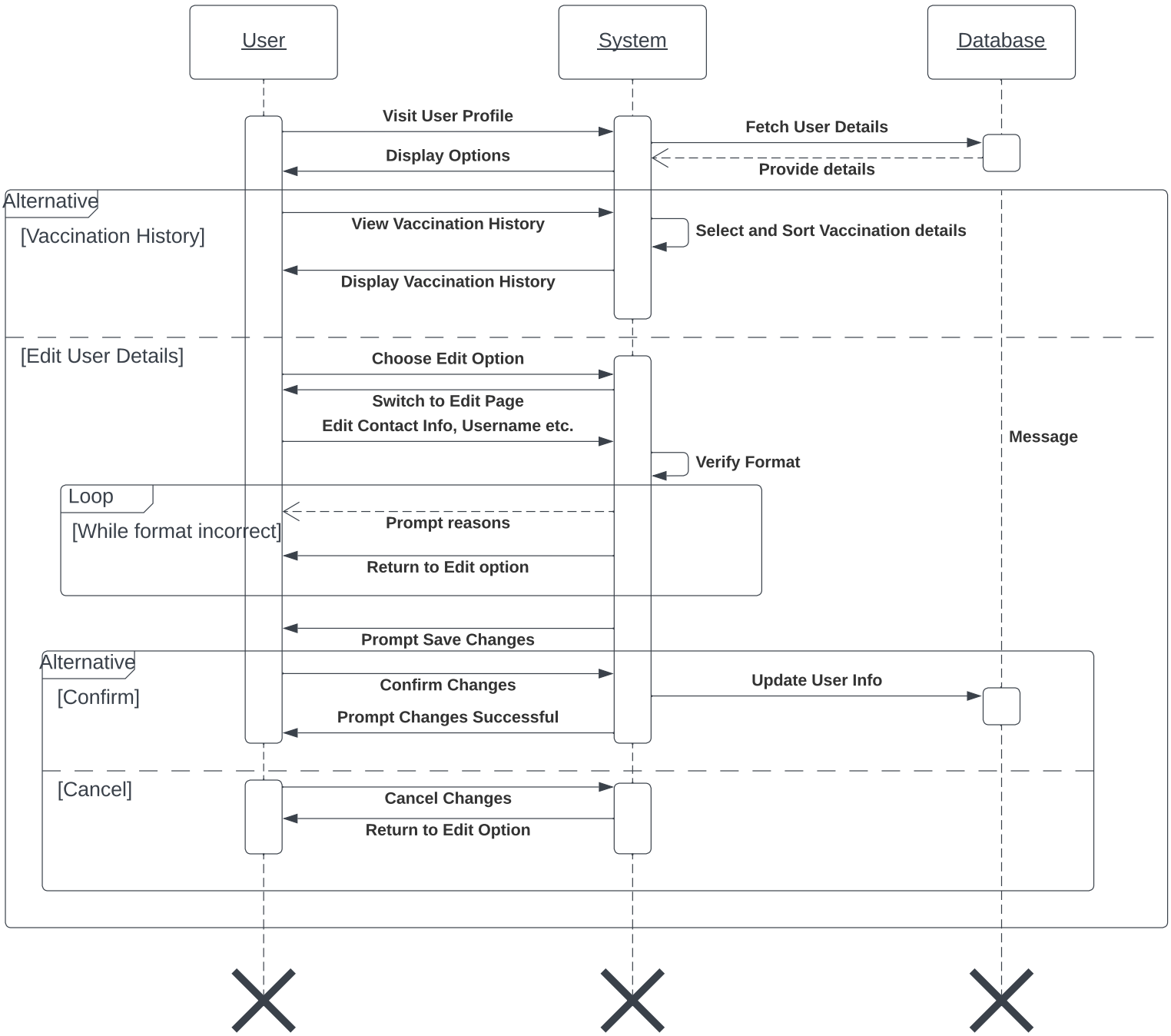


Activity Diagram for Admin Add Option

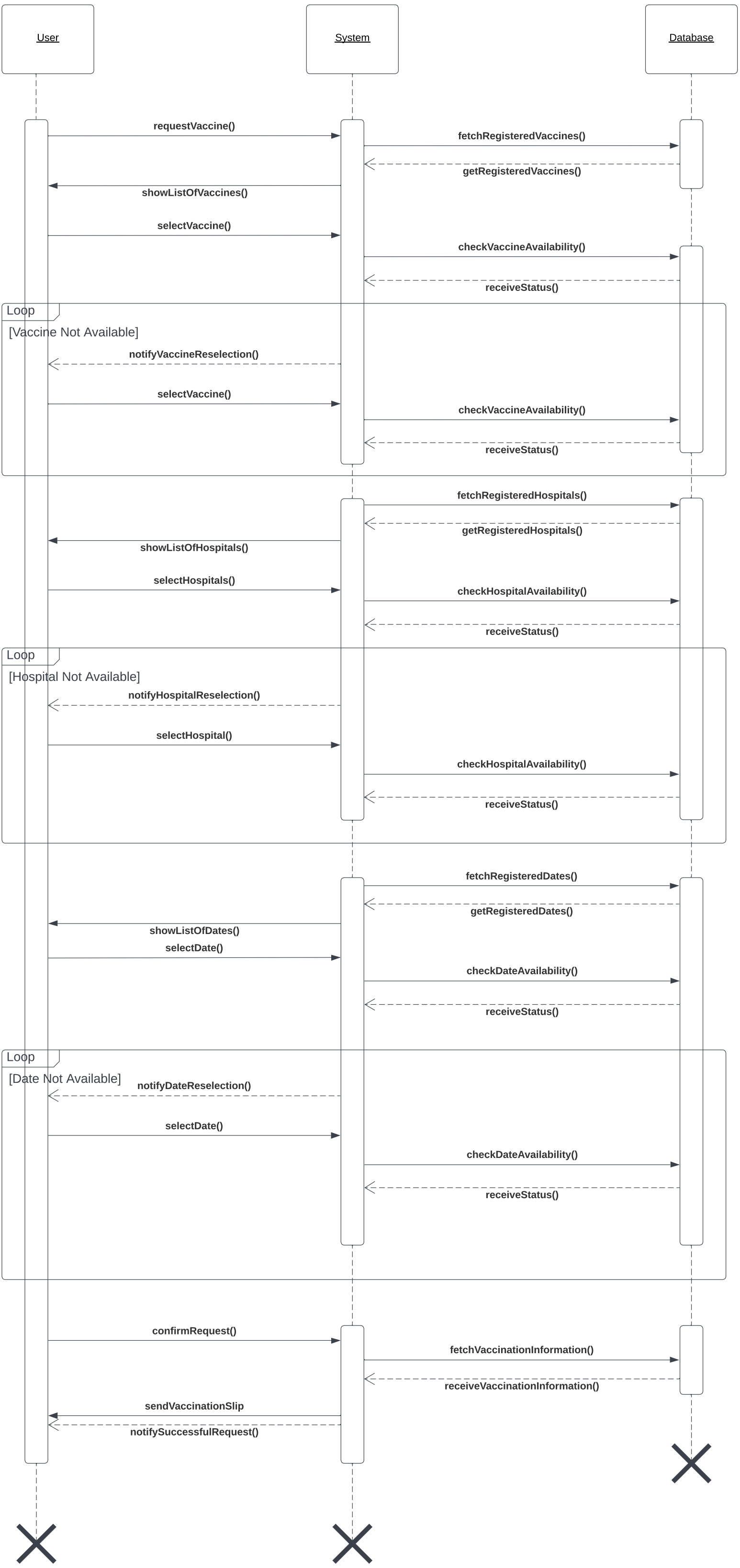



Sequence Diagram For User Login and Signup
User
System
Database
Enter Access Portal
Alternative
[Existing User Login]
Submit Login Credentials
Authenticate Credentials
Verification Result
Alternative
[Correct Credentials]
Successful Login
Redirect to Homepage
[Else]
Unsuccessful Login
Prompt error reasons
[New User Sign Up]
Submit Relevant Credentials
Authenticate NID
Provide Result
Alternative
[Successful]
Loop
[Until OTP is correct or upto 5 tries]
Send OTP
Submit OTP
Verify OTP
Alternative
[Correct OTP]
Prompt Successful Signup
[Incorrect OTP]
Prompt Error
Input User Details
[Unsuccessful]
Prompt Incorrect NID
Return to Sign Up Page

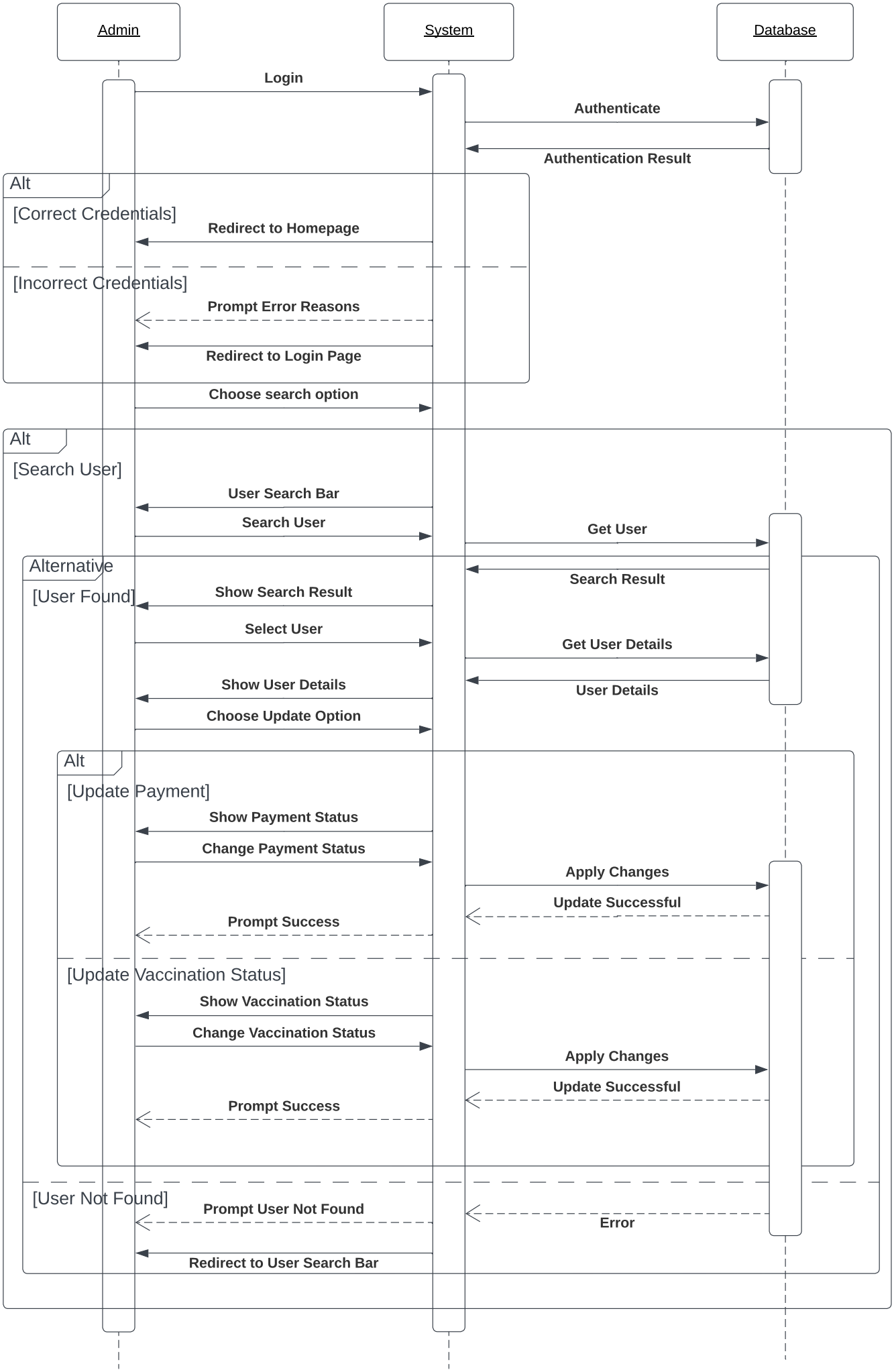
Sequence Diagram For User Profile Viewing and Editing



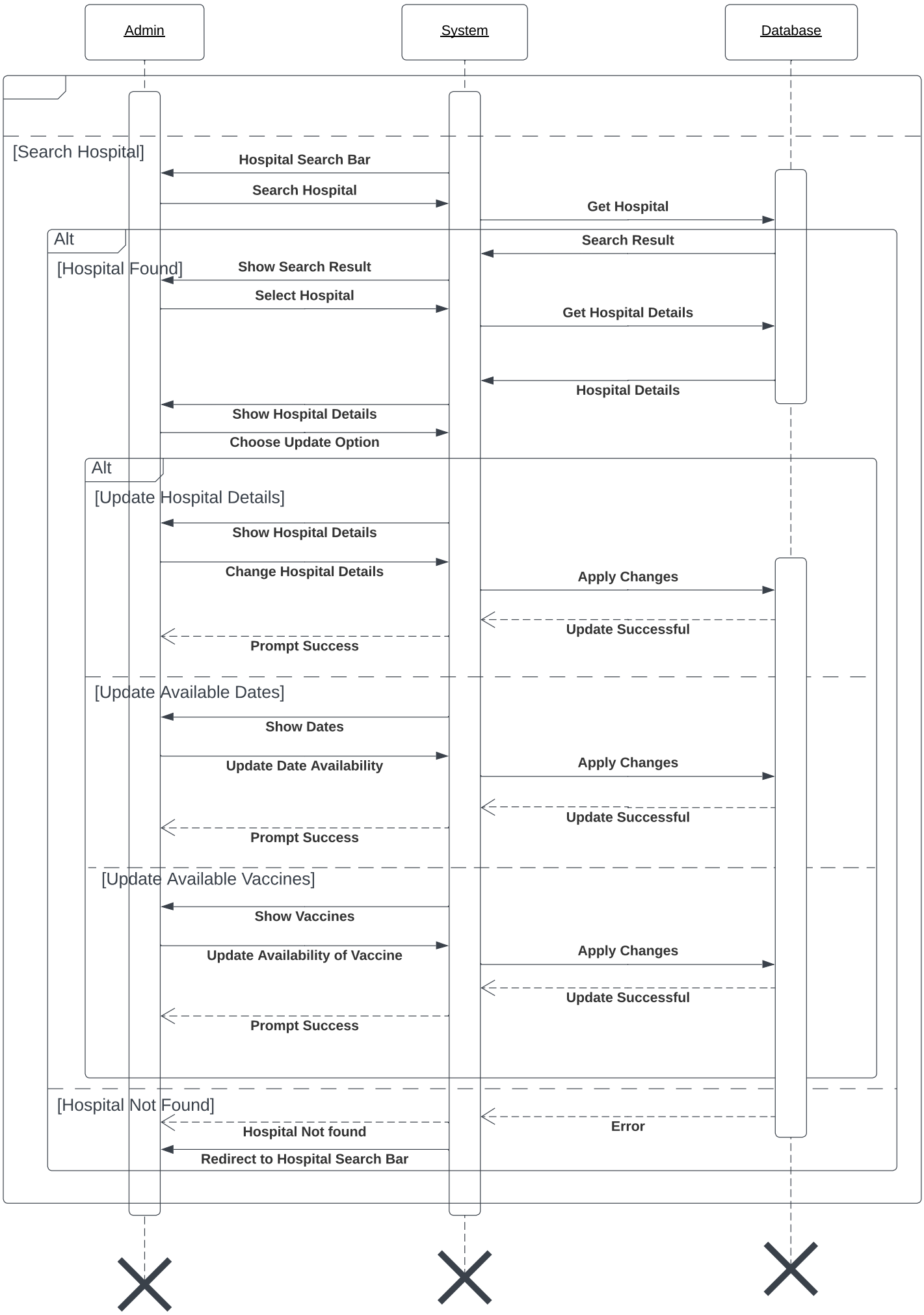
Sequence Diagram for Vaccination Request by User



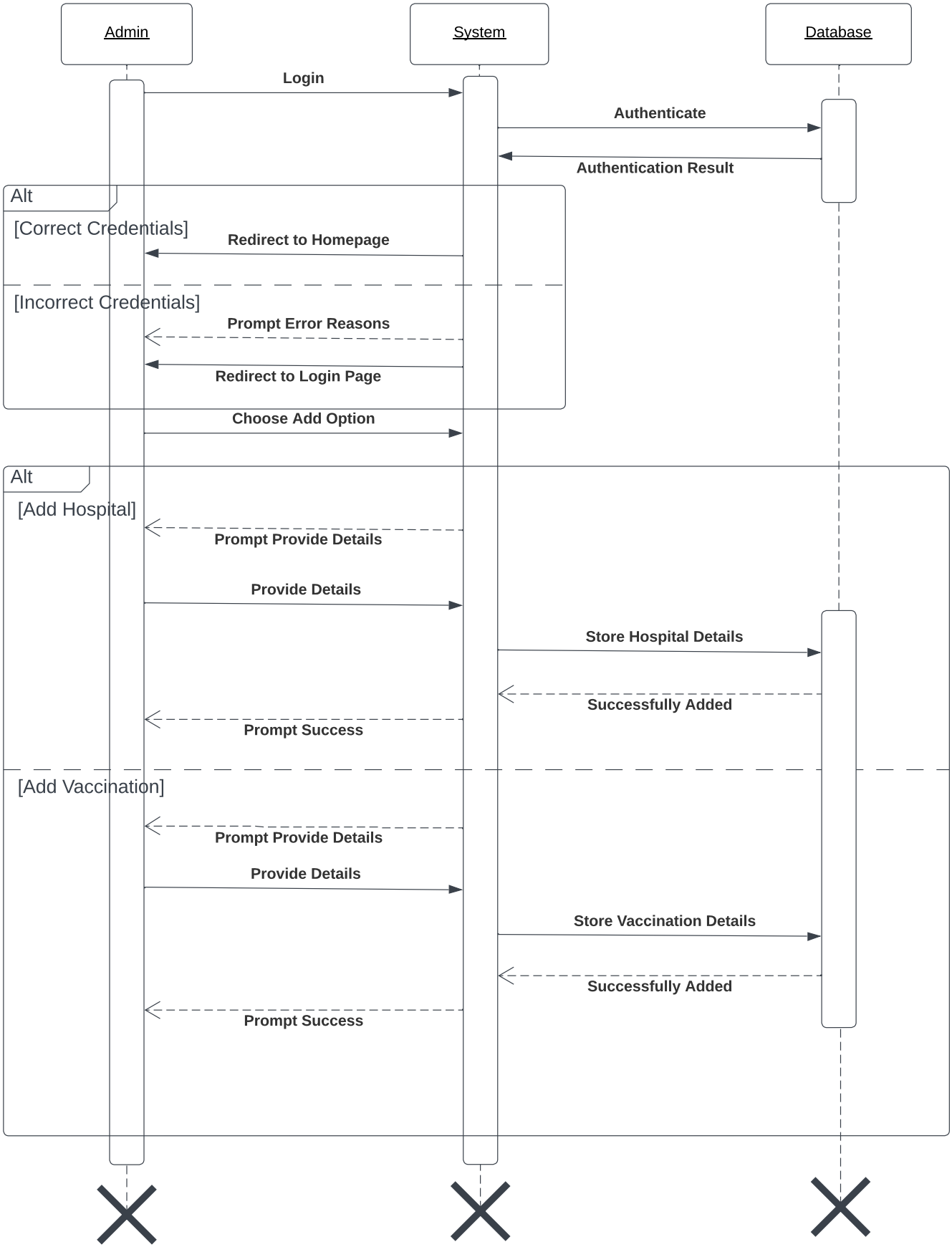
Sequence Diagram For Admin Search Options (Part 1)



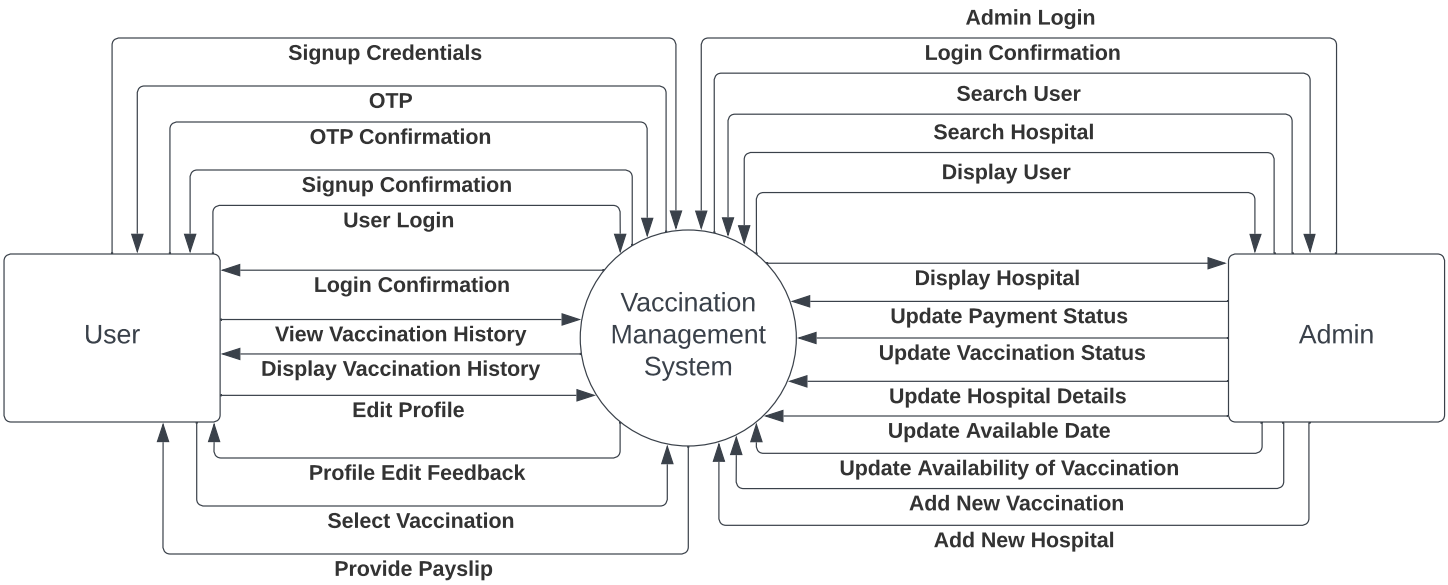
Sequence Diagram For Admin Search Options (Part 2)



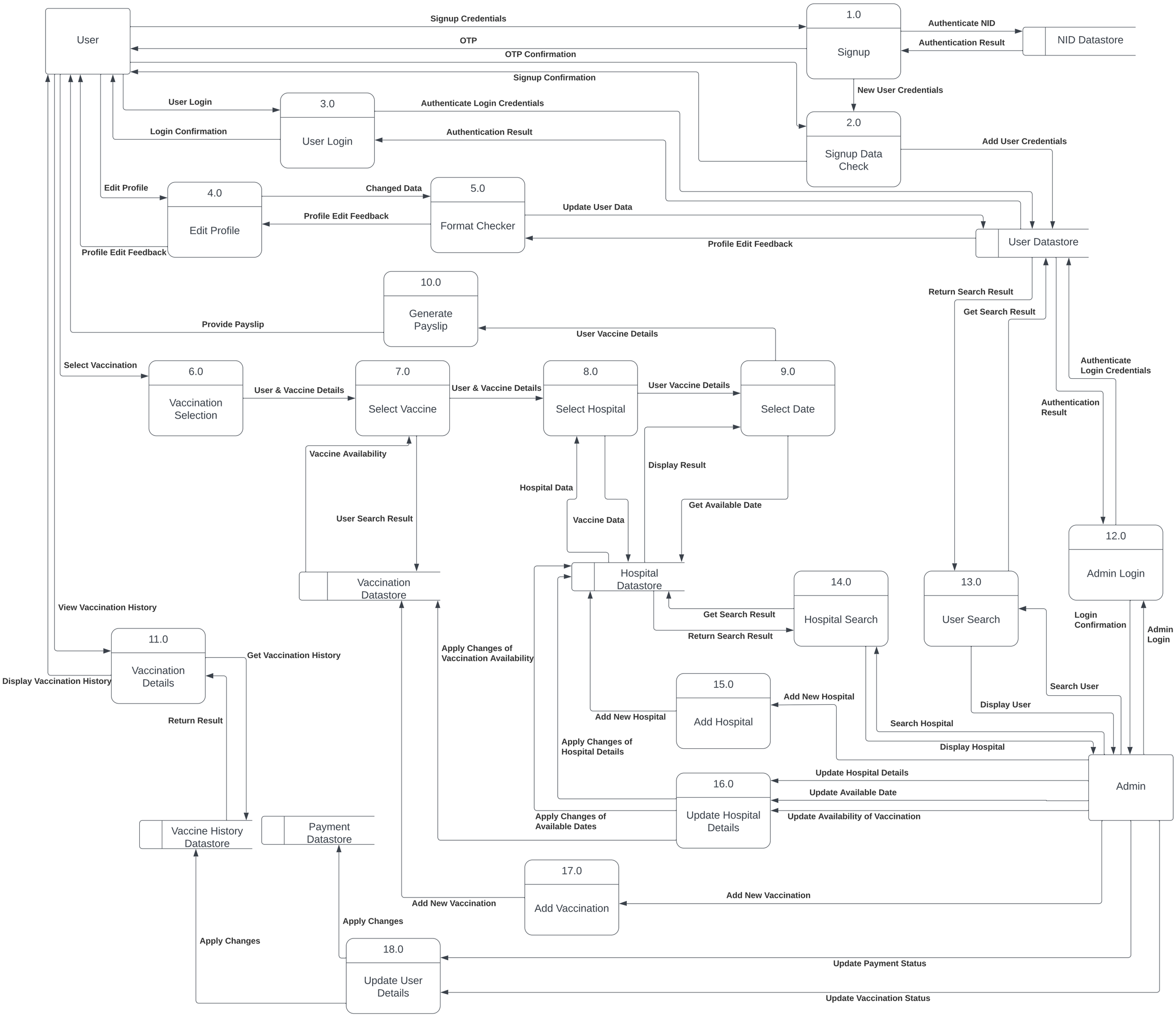
Sequence Diagram For Admin Add Option



DFD Diagram (Level 0)



DFD Diagram (Level 1)



Windows Navigation Diagram for Vaccination Management System