Project Title: Prescribe bd

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This Project report has been submitted in fulfillment of the requirements for the Degree of

Bachelor of Science in Software Engineering.

DECLARATION

I declare that I have honestly completed the Prescribe BD Project under the supervision of **Mr. Sk. Fazlee Rabby**. Lecturer (Senior Scale). The entire work including the project plan has been completed individually by me for my B.Sc. degree in Software Engineering. No part of it has ever been used for any degree in this university or any other university. And nowhere else has it been displayed.

Certified by:

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Approval

This thesis/project/internship titled on "Prescribe BD", submitted by Md Belal Hossain, ID: 181-35-2314 to the Department of Software Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of Bachelor of Science in Software Engineering and approval as to its style and contents.
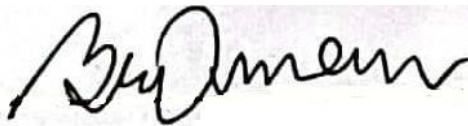
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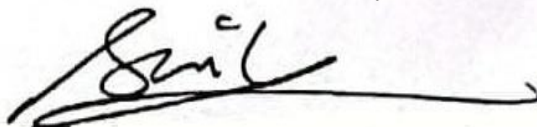
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ACKNOWLEDGEMENT

My childhood dream was to become a doctor and serve people but that opportunity did not happen. To fulfill that childhood dream, I have planned to do something in the health sector which is no less important than being a doctor.

I would like to dedicate this project-based research to the welfare of the country and nation. As if the health service of Bangladesh can be protected from all the complications including ongoing corruption, counterfeit drugs, fake doctors, wrong treatment and patient harassment. And to restore the trust of the citizens towards the health services of the country by keeping the reputation of respected doctors and the pharmaceutical industry intact.

Abstract

The progress of health care in Bangladesh is quite commendable but there is no complacency. Ongoing corruption, adulterated drugs, fake doctors, malpractice and various unethical complications including patient harassment have created citizens' distrust of the state's medical system and medical technicians and have made healthcare a killer.

By using information technology, we can deal with these unethical complications by collecting and processing all information including patients, doctors, drug sellers, drug validity. Moreover, stored patient information will be helpful for the physician and save both time and money for the patient.

Prescribe is a potential technology that can help to overcome the aforementioned challenges. By storing all the information of the patient under a unique ID, by establishing the interrelationship between the patient and all the levels of medical services, we can enjoy the highest quality of medical services and maximum benefits of advanced medical services.

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CHAPTER 1: INTRODUCTION

1.1. Project overview

Under this system the medical technicians will store all the information of the patient, the pharmacies will provide the information of the running medicine, the audit committee will monitor according to their responsibilities, the data scientist and the data analyst will give the indication of necessary future steps. The quality of health care of the patients will be improved as all the data of the patient's life is stored. Patients will be relieved from adulterated medicine, false doctor's wrong treatment, chronic irregularities, suffering in healthcare. The country's health sector will be able to achieve certain targets and the pharmaceutical industry will be spared economic losses. Opportunities will be created to implement online services and complexity will be eliminated.

1.2. Project Purpose

➢ To control and monitor the quality of national health services.

➢ Store and provide all necessary information to the patient.

➢ To maintain and preserve the validity of all services.

➢ Controlling or preventing medical fraud and drug fraud.

➢ Monitoring fraud or patient harassment in the name of service.

Usually when patients seek medical attention, they fail to provide the physician with all the necessary precise information. And in this case doctors have to give a lot of time and labor. Patients are wasting money through additional tests as well. Although the advanced hospitals in our country keep the patient's previous information in their own efforts, it is considered ineligible to transfer to another hospital. In this case the patient has to bear the additional cost of re-examination.

By storing this patient information, I plan to implement a state-of-the-art modern health protection to restore the confidence of citizens in the state's medical system and medical technicians by eliminating various complications including ongoing corruption, adulterated drugs, fake doctors, malpractice, and patient harassment in the National Health Service. store and provide all the necessary information of the patient. The name of this project is 'Prescribe bd '.

1.3.   Motivation

The progress and investment in Bangladesh's health care is quite commendable, but the spirit of the people on the quality of the country's health care is gradually deteriorating. People scorn hospitals as slaughterhouses and doctors as butchers. Due to lack of proper maintenance, a number of fake doctors and fake medicine manufacturing companies are gradually ruining the reputation of the reputed doctors and health sector of our country. If verified, it will be seen that often 30 to 40 percent of adulterated drugs are being sold in the market. And about 10 thousand stupid and evil people are harming people's lives and property by pretending to be doctors. In such a situation citizens have lost faith in the symbol of health care of the country and our reputed doctors and pharmaceutical companies are insulted and people are moving abroad for medical care if they can afford it. And if there is no capacity, the patients are being cheated and losing their lives in the clutches of the fraudsters of the country. So I plan such a project, through which we can protect the country's health care from all evil forces including ongoing corruption, adulterated drugs, fake doctors and patient harassment.

1.4. Background study
1.4.1. Improved drug traceability:

In June 2019, the Department of Drug Administration informed the High Court that adulterated and expired drugs worth Tk340.75 million had been destroyed in the last three months. [**a-1**]

According to statistics, 15 percent of the world's medicines are counterfeit. In some countries in Asia and Africa, the amount of counterfeit drugs is 50 percent. In Angola, counterfeit drugs account for 80 percent of all drugs.

Countries such as Australia, Canada, Japan, New Zealand, Western Europe, and the United States account for less than 1 percent of counterfeit, adulterated, and substandard drugs. [**a-2**]

By making and marketing counterfeit and adulterated medicines of various reputed companies and brands:

> The pharmaceutical industry is suffering huge losses.

> The reputation of the specialist doctor is being tarnished.

> Patients hoping for a cure are heading for death.

> Patients and relatives of patients are losing faith in doctors and moving abroad in search of better treatment.

As a result of the misuse of science, there is no way to identify the real and the fake. Only using information technology systems can differentiate between counterfeit and genuine drugs.

1.4.2. Unauthorized Treatment

According to the Bangladesh Medical and Dental Council (BMDC), there are more than two and a half hundred fake doctors in the capital alone, more than 20,000 across the country. But in reality, more fake doctors than the figures given by BMDC are spreading across the country. The number of fake doctors as well as 'specialist doctors' with fake degrees is not less.

Most of the medical services in private hospitals-clinics-nursing homes are being run by doctors with 90% fake degrees. [b-1]

144 fake doctors in only one upazila! [b-2]

1.4.3. System similarity

The most successful and developed countries in the field of national health care somehow rely on the support of medical information management systems in their national health services.

The e-health system in Estonia, called the Estonian nationwide Health Information System (EHIS) has been operational since the end of 2008. About 95% of the citizens are receiving health care comfortably under this system. The quality of their healthcare has been steadily rising since 2010. Interestingly, the quality of their healthcare has reached a certain level just when the objectives of this system have been implemented.

Best Healthcare in the World 2022

Country	LPI 2020 Ranking	LPI 2019 Ranking	CEO World Ranking	2022 Population
Estonia	21	21	32	1,321,910
Bangladesh	125	123	85	167,885,689

The e-prescription system that has been launched at the beginning of 2010, was very quickly accepted by all parties and today approximately 99% of medical prescriptions in Estonia are issued electronically.

[c-1]

1.5. Scope

Enjoying the maximum results of the laws and regulations imposed by the state to control the quality of healthcare, and eliminating health care irregularities, risks for unauthorized changes, Transactions, etc., we can easily implement through this medical information system.

Creating a close relationship between physician and patient on the basis of appropriate information will reduce the suffering of medical services. This system will play the most helpful role in providing emergency medical services.

1.6.   Graphical view of the proposed project

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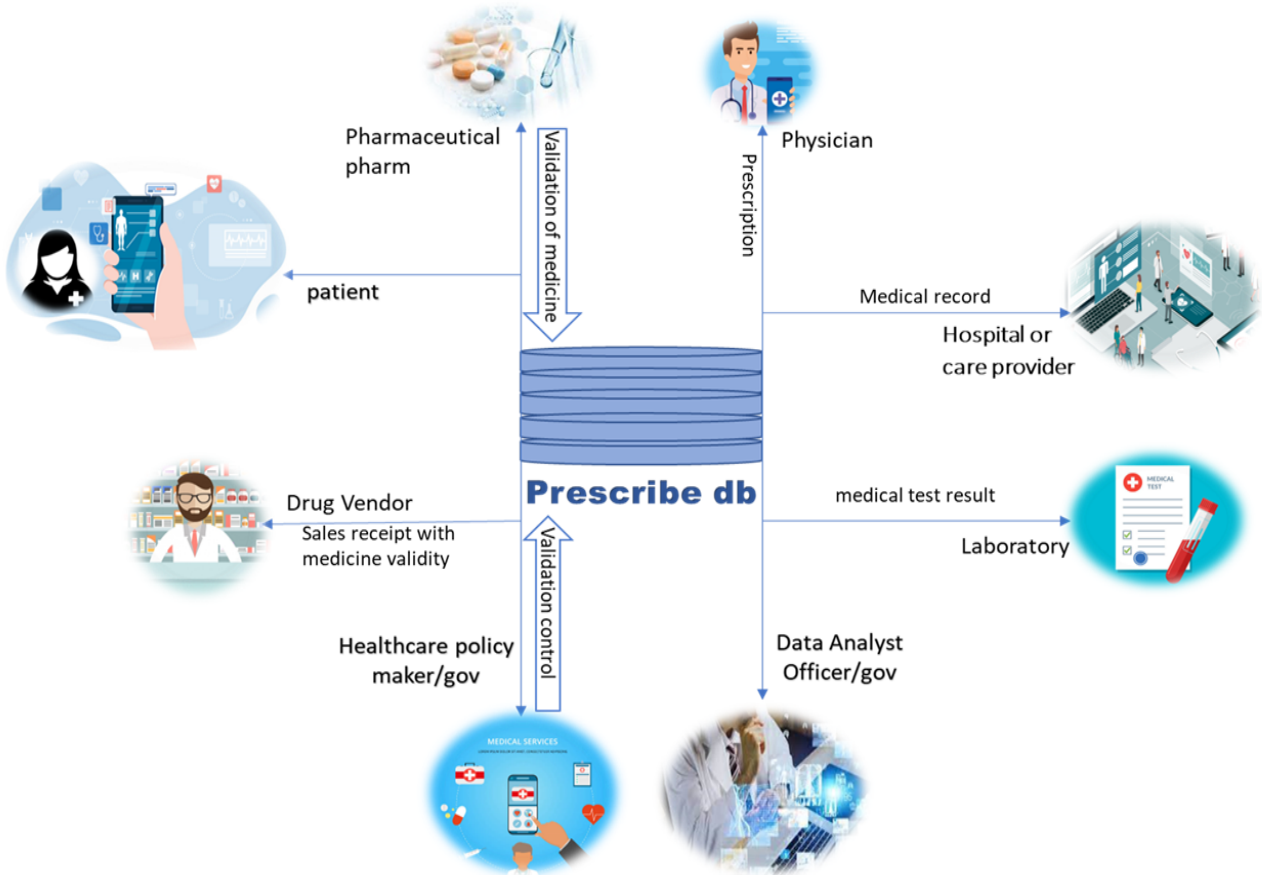
1.7.   Overview

Every citizen of the country will come under this system through a unique patient ID.

Each doctor, nurse, hospital, diagnostic center, laboratory, pharmacy and all kinds of medical technicians will provide the required input under this system through the unique registration number of the state and enjoy the benefits.

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1.8.   The goal of the project

To store and provide all the necessary information of the patient.

Maintain and monitor the validity of health care exchanges.

Under the system, Medical technicians will provide digital prescriptions to patients, laboratories will test them according to those prescriptions, and pharmacies will dispense medicines and store digital information.

The Data Scientist and Data Analyzer will provide guidance on the essential aspects of healthcare through this system.

Physicians will be able to provide treatment to the patient easily by collecting the necessary data in the interest of maintaining the health of the patient. This will ensure an improved approach to low cost funding.

The audit committee appointed by the state will reserve the right to enter the system according to its responsibilities and limitations.

Citizens of remote areas can take the advice of national experts online as per their need.

1.9.   Stakeholders

Patients

Physicians

Employers

Pharmaceutical firms

Diagnostic center

Laboratory

Pharmacy

Clinic

Health org

Government. {Scientist and Data Analyzer, The audit committee, admin}

1.10. Project Schedule

Time-framed action plan to implement the first circle of the Prescribe BD project within a specified period.

1.11. Gantt Chart

week \ activities	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13
need finding	■	■	■										
requirement gathering			■										
arrangements			■	■									
UI design				■	■								
Front-end development				■	■	■	■	■					
backend development						■	■	■	■	■			
Testing										■	■		
Assessment												■	
Documentation				■									■

CHAPTER 2: REQUIREMENT ENGINEERING

2.1.   Functional requirement

2.1.1.   Categories user authentication

2.1.1.1.   *Sign in / Sign out*

2.1.1.2.   *Patient profile*

Sign up

View own drug list, prescription list, report list, all diseases, medical record & payment history.

Patients can request an appointment (online or offline)

Can provide feedback on service quality.

Patients can follow, view content and like-comment.

2.1.1.3.   *Physician profile*

Sign up with valid registration.

Doctors can make, cancel and accept appointments.

Doctor can see all information in patient profile.

Will provide prescriptions and identify diseases.

Doctor can create or edit blogs.

Can follow, view content and like-comment.

May have followers

2.1.1.4.   *Drug Vendor Profile*

Sign up with valid registration.

Can view prescriptions in patient profile.

Will supply drugs (record) as per prescription including drug validity code.

Generate money receipt.

Vendor can follow, view content and like-comment.

2.1.1.5.   *Laboratory profile*

Sign up with valid registration

Can view prescriptions in patient profile.

Providing test reports.

Generate money receipt.

2.1.1.6.   *Hospital or care provider*

Sign up with valid registration

Check in check out

Provide medical record.

Generate money receipt.

2.1.1.7.   *Pharmaceutical farm*

Sign up with valid registration.

Pharmaceutical firms provide unique signatures of drug validity. and determine the price.

2.1.1.8. Admin panel

Can regulate the validity of registration of service providers.
Regulating the validity of drug registration.
Admin will get unauthorized activity message.
Admin has a profile. & Admin can create or edit event/content.
Admin can audit all information at all levels. And can run any operation.

2.2. Non-Functional requirement

2.2.1. Security

According to the user authentication, the validity and limitations of each user must be properly implemented.

Sensitive operations/changes like delete, insert, update must be synchronized quickly.

The Admin Panel shall have no power or right to modify, alter or delete data stored in the database. admin panel can only use the data.

System will implement a two-layer security system for users.

2.2.2. Performance & Scalability

The system will execute the process of storing and displaying the information in the patient profile within one second.

According to the doctor's request, the user profile must be displayed as quickly as possible, which must be within one second.

The system must have the capacity to execute at least two million requests at the same time.

The user interface will fully load within five seconds.

2.2.3. Maintainability

The system will provide highly sensitive defensive efficiency in terms of data backup.

To avoid accidents, database recovery must be maintained.

System must have track every mistake as well as keep a log of it.

2.2.4. Reliability

At any cost the system should be kept active and fresh all the time.

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2.2.5. *Security*

According to the user authentication, the validity and limitations of each user must be properly implemented.

Sensitive operations/changes like delete, insert, update must be synchronized quickly.

The Admin Panel shall have no power or right to modify, alter or delete data stored in the database. admin panel can only use the data.

System will implement a two-factor security system for users.

CHAPTER 3: SYSTEM ANALYSIS, DESIGN & SPECIFICATION

3.1. SDLC Model of the proposed project:

Spiral Model has been used to implement the proposed project. The National Health Service is a sensitive department. There are many levels of planners and maintainers involved. Different levels of interests including patients are involved here. So, the implementation of this project may require many levels of consensus. So, this model has been used in this project so that it is easy to modify the movement of the project according to the demand.
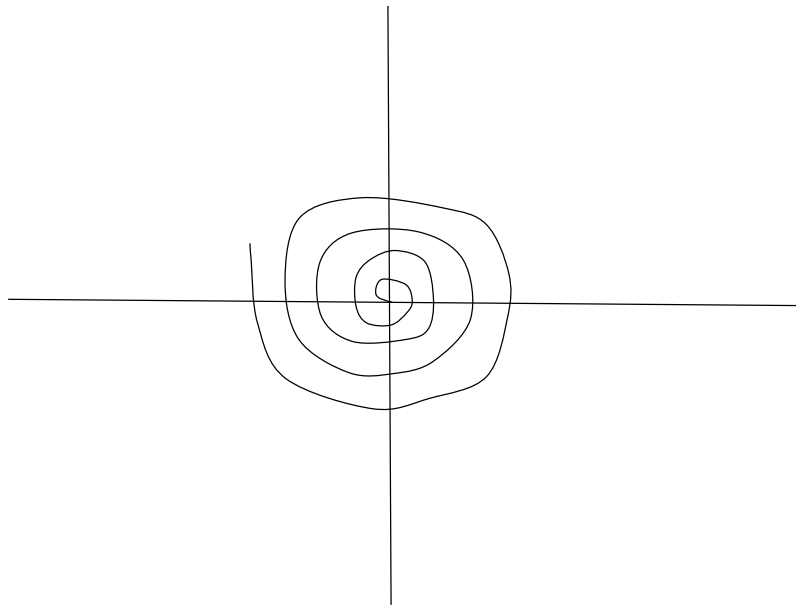
Figure: Spiral Model

3.2. Use Case Diagram
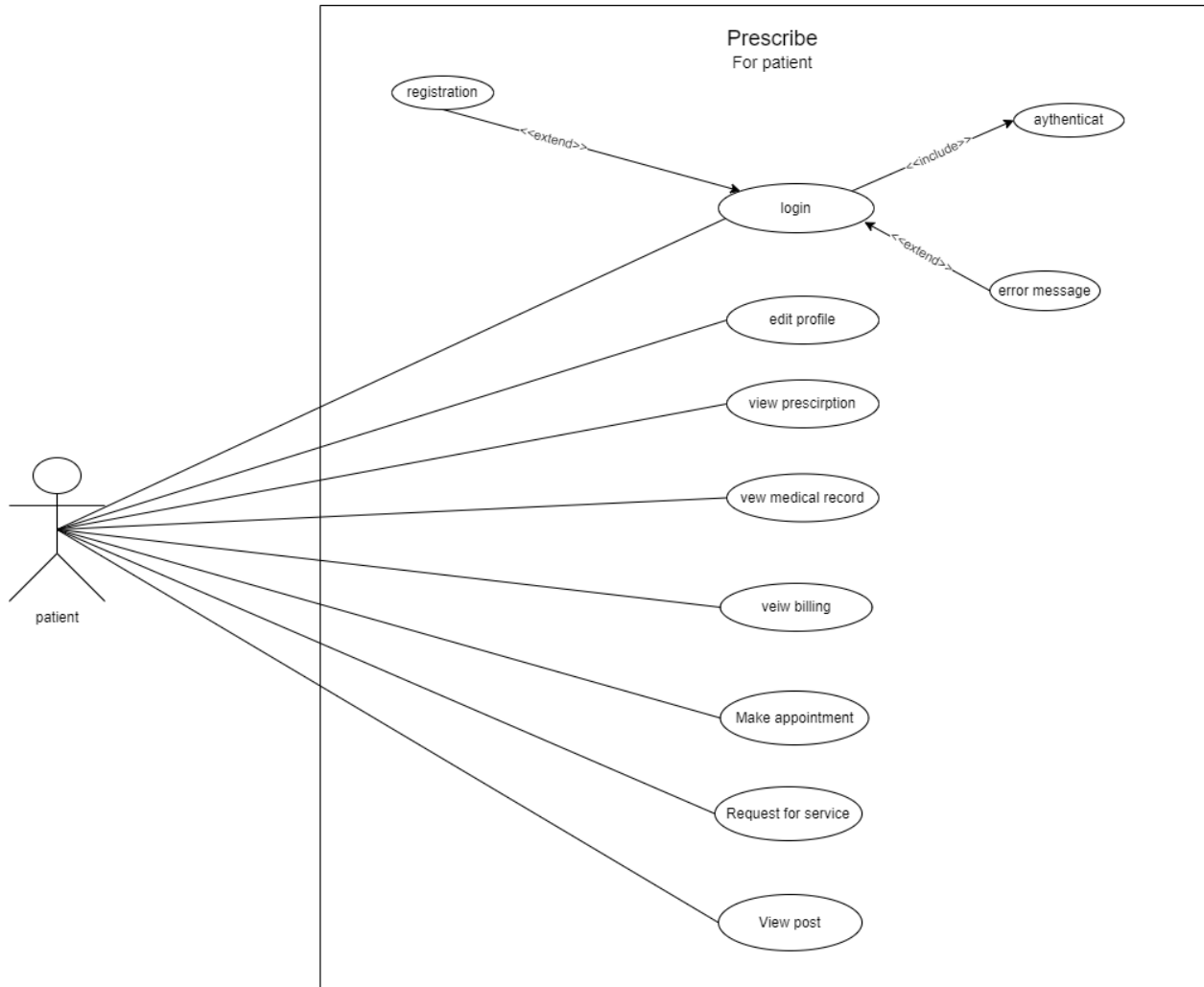
Figure: Use case of patient

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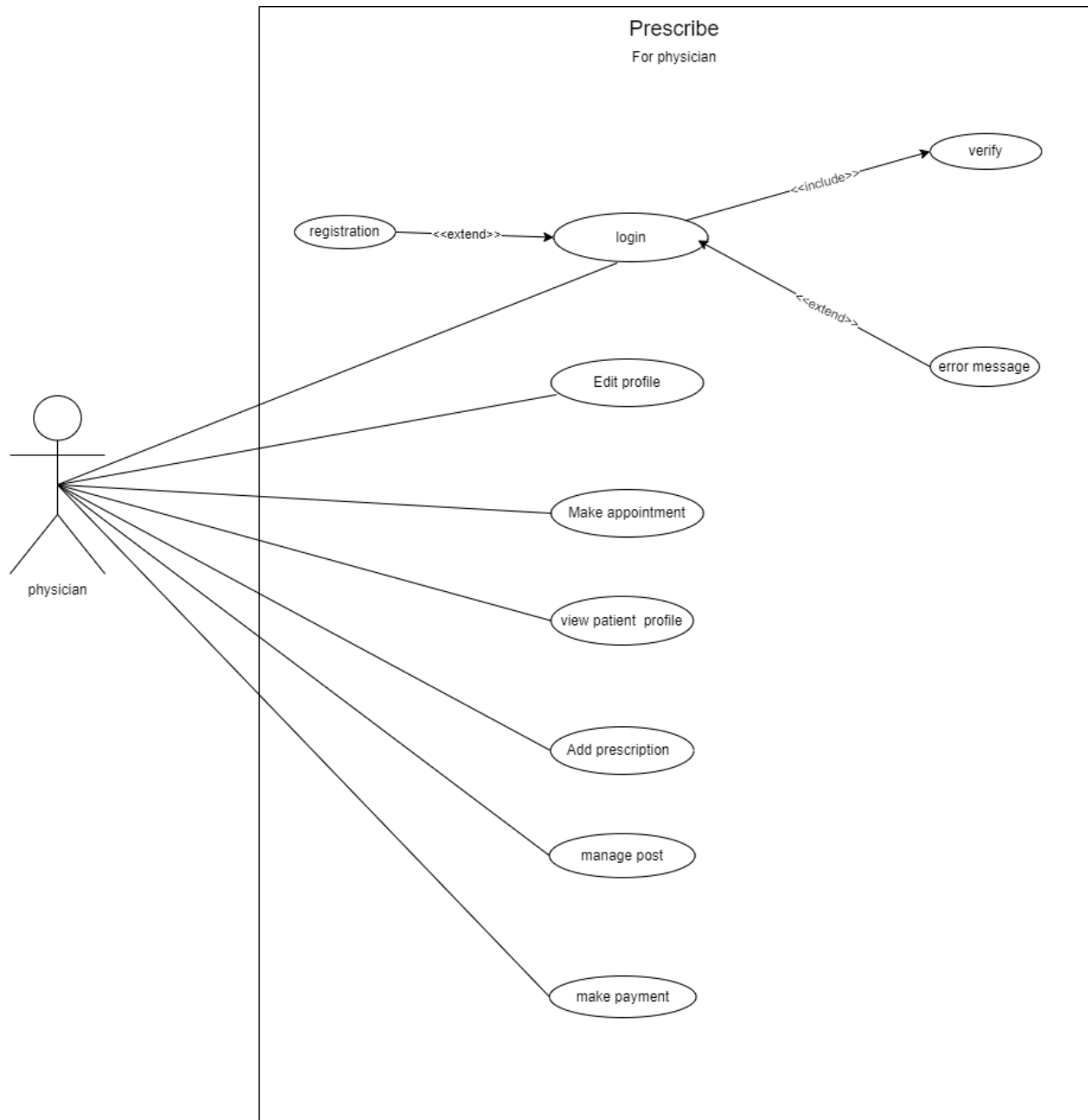
Figure: Use case of physician
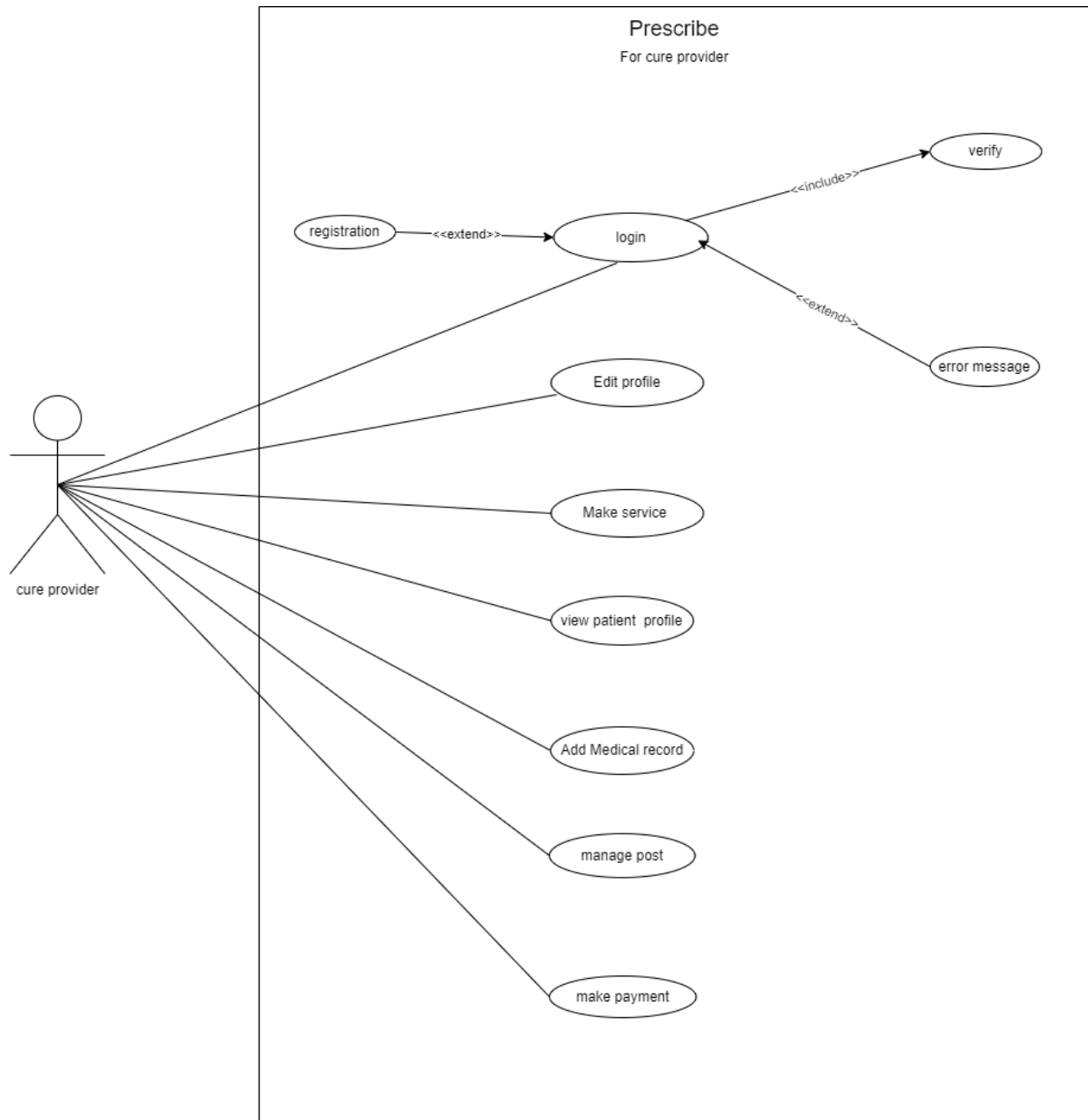
Figure: Use case of cure provider

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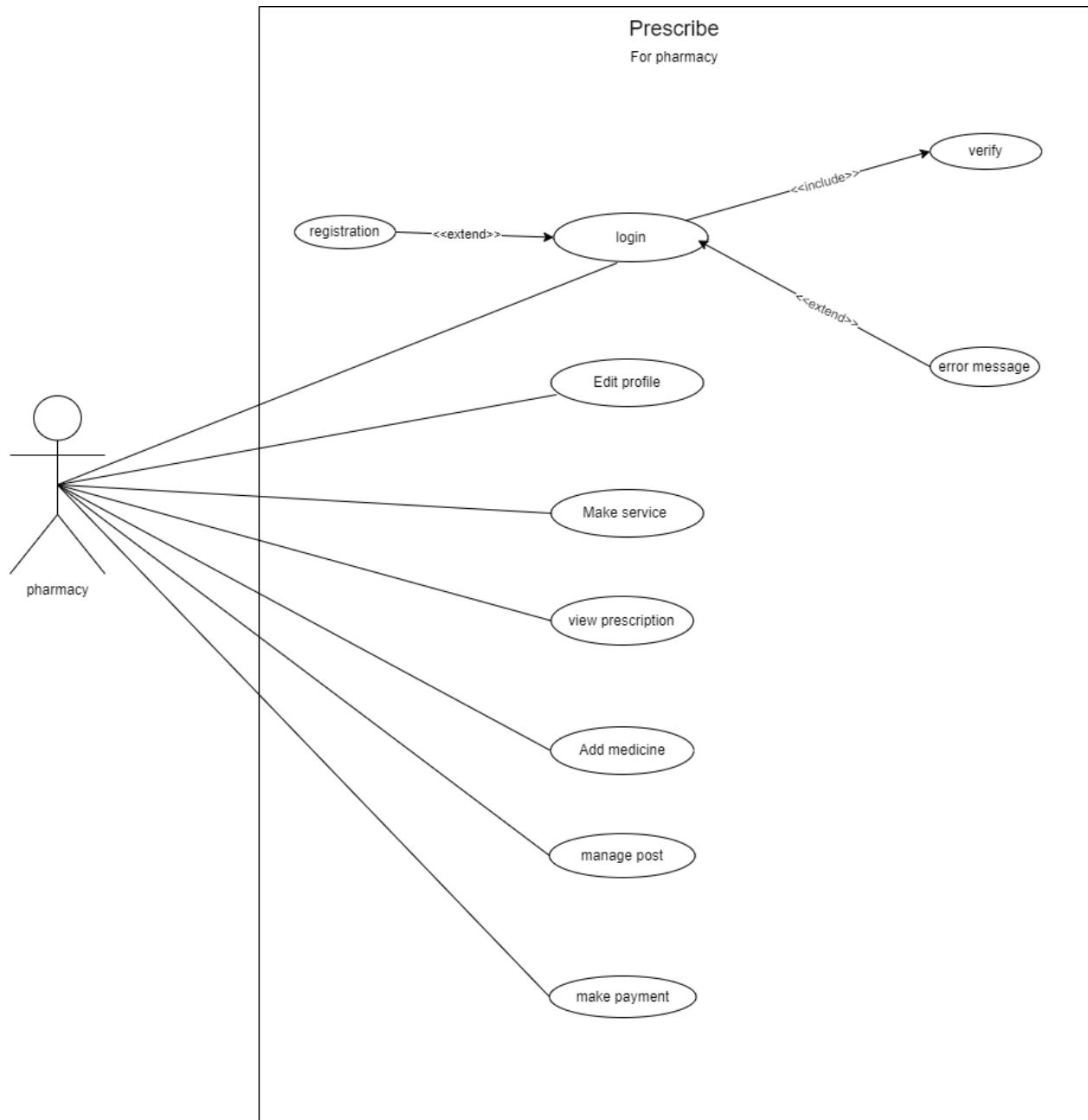
Figure: Use case of pharmacy

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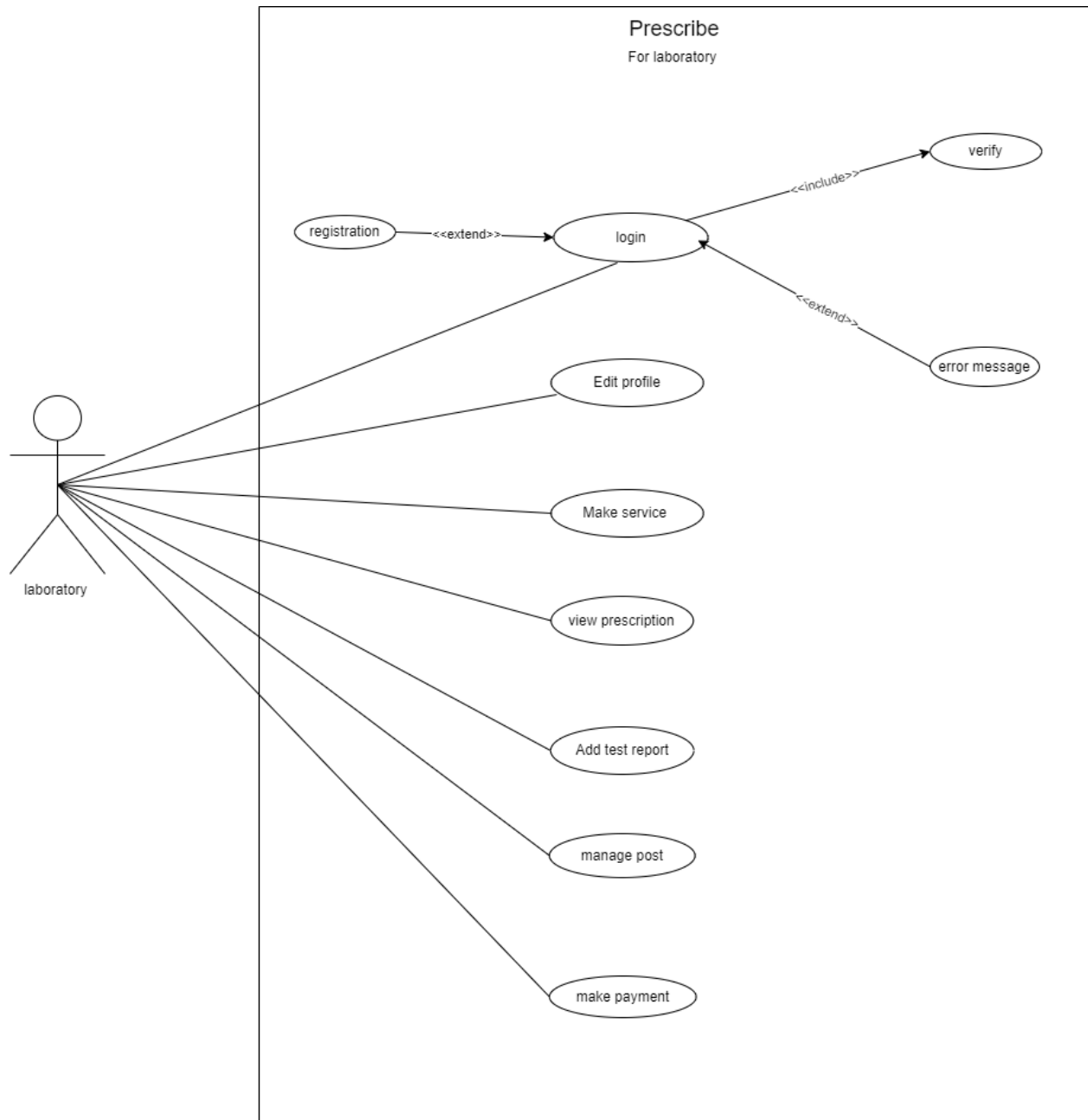
Figure: Use case of Laboratory
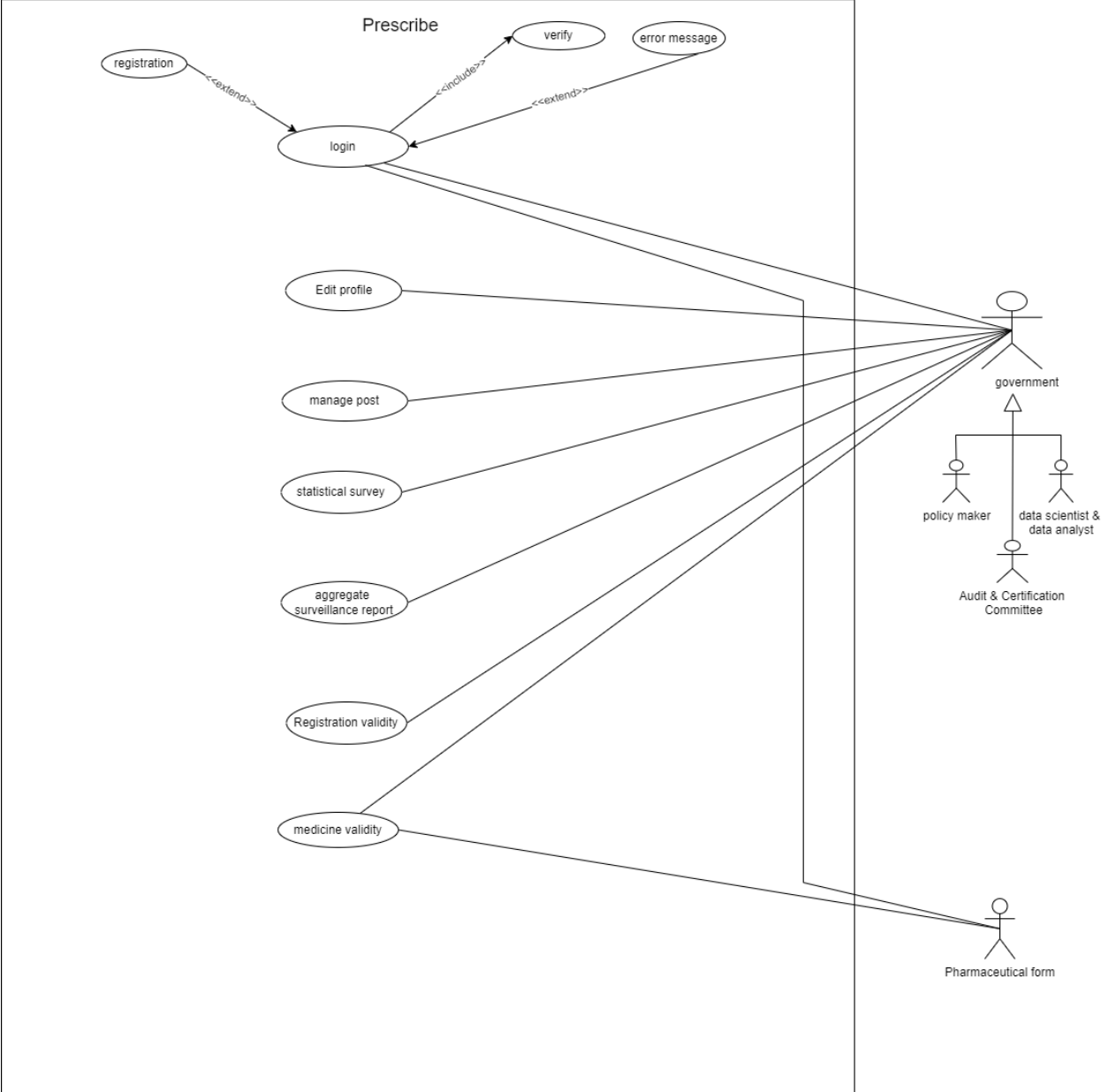
Figure: Use case of Government & pharmaceutical farm

3.3. Use Case Description

3.3.1. Registration

Use Case	registration
Goal	Create account in the system as any user.
Preconditions	choose what kind of user you are
Success End Condition	Successfully created account and taken to login page.
Failed End Condition	Error message will show
Primary Actors: Secondary Actors:	user
Trigger	create account

Description / Main Success Scenario	Step	Action
	a	User click on Sign Up from the homepage
	a.1 a.2 a.3	User will choose user category form from sign up page
	b	Account will be created by providing all the information as required

Alternative Flows	Step	Branching Action
	b1	Will retry with error correction

3.3.2. Login

Use Case	login	
Goal	Get permission to enter the system to enjoy the privileges of the system.	
Preconditions	User must have an account and login with username password.	
Success End Condition	According to the category will take the user to his dashboard.	
Failed End Condition	Error message will show	
Primary Actors: **Secondary Actors:**	user	
Trigger	login	
Description / Main Success Scenario	**Step**	**Action**
	a	User will click on login button
	a.1 a.2 a.3	Provide valid username and password Then click the login button to update
Alternative Flows	**Step**	**Branching Action**
	a 2	Will retry with error correction

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3.3.3. Edit profile

Use Case	Edit profile
Goal	User will edit or update his own profile setting.
Preconditions	User must be in login state.
Success End Condition	Edit or update the profile information and bring back to the user dashboard.
Failed End Condition	Error message will show
Primary Actors: Secondary Actors:	user
Trigger	Edit profile

Description / Main Success Scenario	Step	Action
	a	User will click on profile settings from his dashboard
	a.1 a.2 a.3	User will update or change his/her information as per input requirement Then click submit button
	b	The system will bring the user back to the user's own dashboard.

Alternative Flows	Step	Branching Action
	a 3	Will retry with error correction

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3.3.4. View Prescription

Use Case	View prescription or view medical record or view test report or view billing
Goal	The user can view his own prescription list, medical record list, medical test report list and money receipt or billing list from his own dashboard.
Preconditions	User must be in login state.
Success End Condition	User can view any prescription or medical record or money receipt or test report test report or any information in detail from any list.
Failed End Condition	Error message will show
Primary Actors: Secondary Actors:	user
Trigger	Request to view the list.

Description / Main Success Scenario	Step	Action
	a	User will click on View prescription or view medical record or view test report or view billing from his dashboard
	a.1 a.2	User can request to view any list item in detail from any list and can-do detailed view. Then click submit button

3.3.5. Add Prescription

Use Case	Add prescription
Goal	Will add prescription to patient profile.
Preconditions	User must be in login state. And User must be a is_doctor
Success End Condition	Will successfully add prescription to patient profile
Failed End Condition	Error message will show
Primary Actors:	User (is doctor)
Secondary Actors:	User (is patient)
Trigger	Request for Add Prescription on user's profile via Add Prescription button.

Description / Main Success Scenario	Step	Action
	a	According to the sequence of the form, the doctor will add all the information to the prescription form of the patient's profile.
	a.1	Then click the submit button to save the prescription.

Alternative Flows	Step	Branching Action
	a. 1	Will retry with error correction

3.3.6. Add medical Report

Use Case	Add medical report
Goal	Will add medical report to patient profile.
Preconditions	User must be in login state. And User must be a "is_hospital /is_clinik"
Success End Condition	Will successfully add medical report to patient profile
Failed End Condition	Error message will show
Primary Actors: **Secondary Actors:**	User (is Hospital) User (is patient)
Trigger	Request for Add medical report on user's profile via Add medical record button.

Description / Main Success Scenario	Step	Action
	a	According to the sequence of the form, the Hospital will add all the information to the medical record form of the patient's profile.
	a.1	Then click the submit button to save the medical record.

Alternative Flows	Step	Branching Action
	a. 1	Will retry with error correction

3.3.7. Add test report

Use Case	Add test report
Goal	Will add test report to patient profile.
Preconditions	User must be in login state. And User must be a "is_ laboratory"
Success End Condition	Will successfully add test report to patient profile
Failed End Condition	Error message will show
Primary Actors:	User (is laboratory)
Secondary Actors:	User (is patient)
Trigger	Request for Add test report on user's profile via Add test report button.

Description / Main Success Scenario	Step	Action
	a	According to the sequence of the form, the laboratory will add all the information to the test report form of the patient's profile.
	a.1	Then click the submit button to save the test report.

Alternative Flows	Step	Branching Action
	a. 1	Will retry with error correction

3.3.8. Add Billing

Use Case	Add Billing
Goal	Will add Billing to patient profile.
Preconditions	User must be in login state. And User must be a "is_ pharmacy"
Success End Condition	Will successfully add billing to patient profile
Failed End Condition	Error message will show
Primary Actors:	User (is pharmacy)
Secondary Actors:	User (is patient)
Trigger	Request for Add billing on user's profile via Add billing button.

Description / Main Success Scenario	Step	Action
	a	According to the sequence of the form, the pharmacy will add all the information to the billing form of the patient's profile.
	a.1	Then click the submit button to save the billing.

Alternative Flows	Step	Branching Action
	a. 1	Will retry with error correction

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3.3.9. View patient prescription

Use Case	View patient prescription
Goal	Will View patient prescription from patient profile.
Preconditions	User must be in login state. And User must be a "is_ pharmacy or is_laboratory or is_doctor or is_hospital"
Success End Condition	Will successfully View patient prescription from patient profile.
Failed End Condition	Error message will show
Primary Actors:	User (is_ pharmacy or is_laboratory or is_doctor or is_hospital")
Secondary Actors:	User (is patient)
Trigger	Request for View patient prescription from patient profile via view prescription button.

3.3.10. Medicine Validity

Use Case	Medicine Validity
Goal	New medicines are marketed.
Preconditions	User must be in login state. And User must be a "is_Pharmaceutical pharm"
Success End Condition	New medicines are marketed successfully. And wait for the approval by the government.
	If accepted by the government, the message sent will be, thank you for marketing the new medicine. Your list of medicines has been accepted by the government and it has been released for sale in the market.
Failed End Condition	Error message will show
Primary Actors: **Secondary Actors:**	User ("is_Pharmaceutical pharm, is_Govt. ")
Trigger	Request for New medicines are marketed.

Description / Main Success Scenario	Step	Action
	a	Drug companies will submit new drug listings from their own dashboards
	a.1	Accordingly, the responsible government department will accept it and open it for sale in the market
	a.2	If accepted by the government, the message sent will be, thank you for marketing the new medicine. Your list of medicines has been accepted by the government and it has been released for sale in the market.
	A.3	Else, New medicines are marketed successfully. And wait for the approval by the government.

Alternative Flows	Step	Branching Action
	a. 1	Get mail from govt.

3.3.11. Registration Validity

Use Case	registration validity	
Goal	Verification of the account of the service provider or organization.	
Preconditions	User must be in login state. And User must be a "is_Goivt"	
Success End Condition	Account verified	
	The account will go into the verify account list.	
Failed End Condition	Cancel or freeze the account.	
Primary Actors:	User ("is_Govt. ")	
Secondary Actors:	User(is_doctor,is_ pharmacy, is_ Hospital laboratory)	
Trigger	Request for New medicines are marketed.	
Description / Main Success Scenario	**Step**	**Action**
	a	The responsible department of the government will enter in the I verified account list.
	a.1	From that list, each of the accounts will be seen in detail. and will review and approve or cancel or freeze the account.
	a.2	If the account is approved, the profile of the account will show Verified Profile. Otherwise unverified account will show.
	A.3	And if the account is cancelled, the account will be deleted completely
Alternative Flows	**Step**	**Branching Action**
	a. 1	The account will be in the unverified list.

3.3.12. Edit post

Use Case	Edit post
Goal	Doctors will be able to write medical blogs and government account holders will be able to publish various essential news or policies in the form of blogs.
Preconditions	User must be in login state. And User must be a "is_ doctor or is_Govt"
Success End Condition	successfully add blogs
Failed End Condition	Error message will show
Primary Actors: **Secondary Actors:**	User (is_ doctor or is_Govt") All other users
Trigger	Request for create post

Description / Main Success Scenario	**Step**	**Action**
	a	Click on add post button from doctor or government account to get the post form.
	a.1	Then click the submit button to save the post.

Alternative Flows	**Step**	**Branching Action**
	a. 1	Will retry with error correction

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3.4. Activity diagram

3.4.1. Sign up

Figure: Activity Diagram of Sign up

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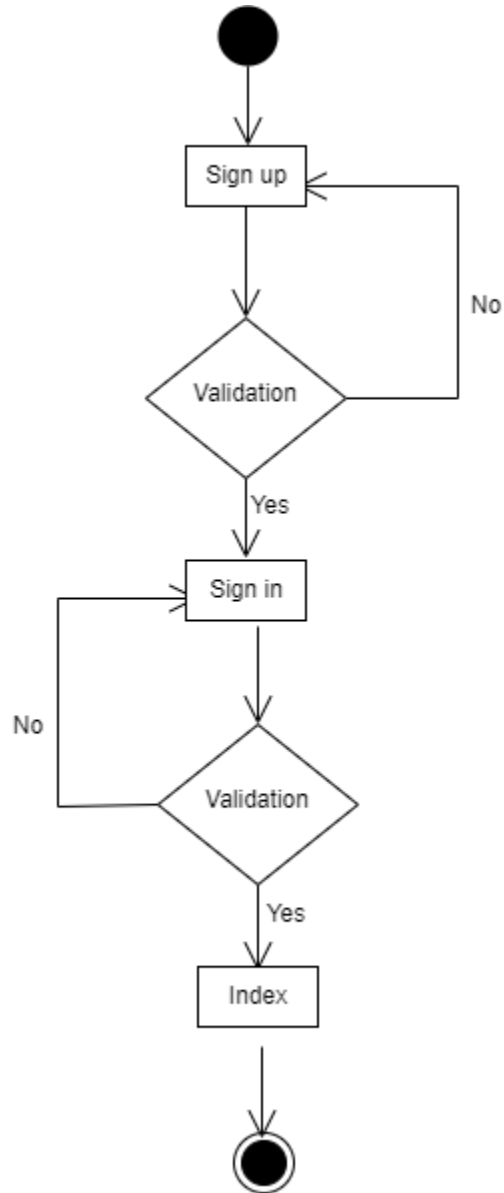
3.4.2. Sign in

Figure: Activity Diagram of Sign in

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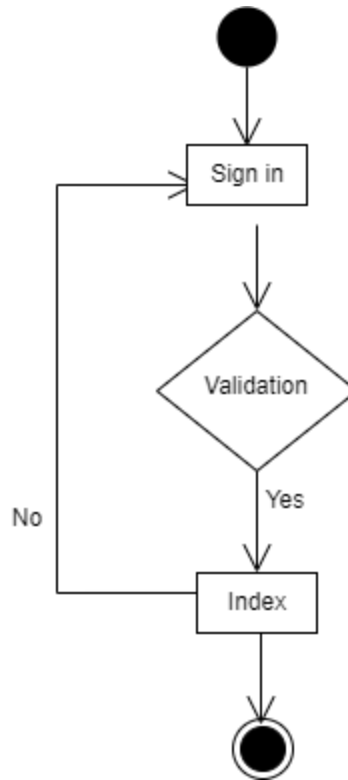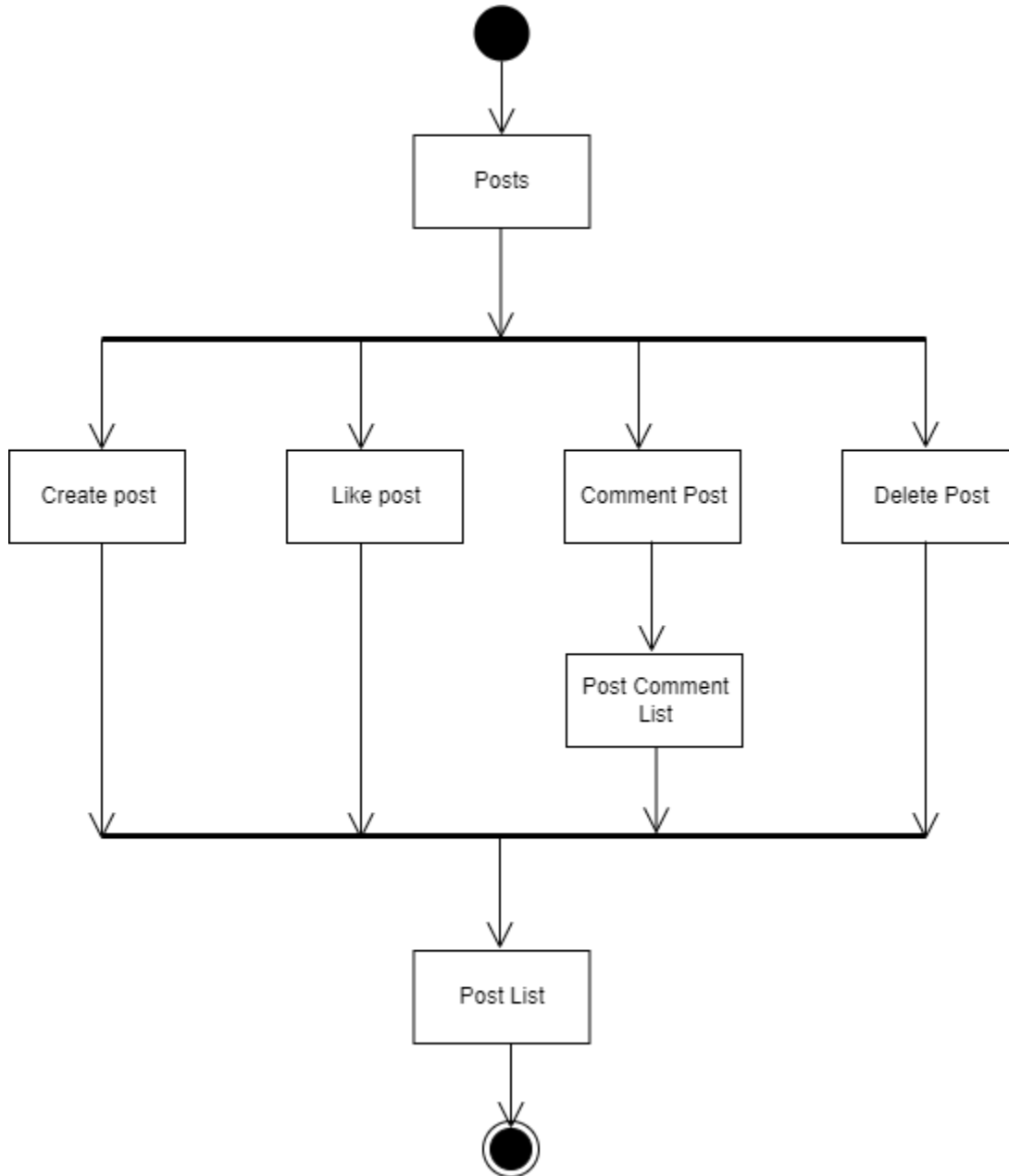
3.4.3. Manage post

Figure: Activity Diagram of Manage Post

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3.4.4. Make appointment
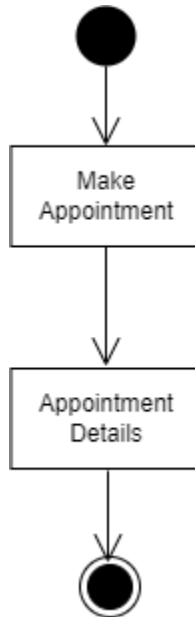
Figure: Activity Diagram of Make appointment

3.4.5. Edit profile
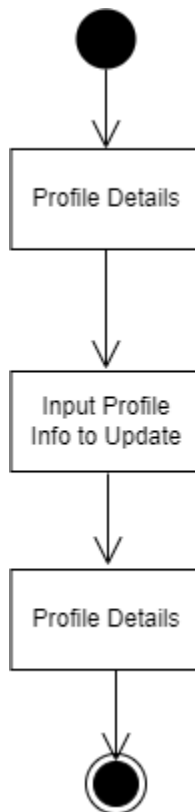
Figure: Activity Diagram of Edit profile

3.4.6. Check validity
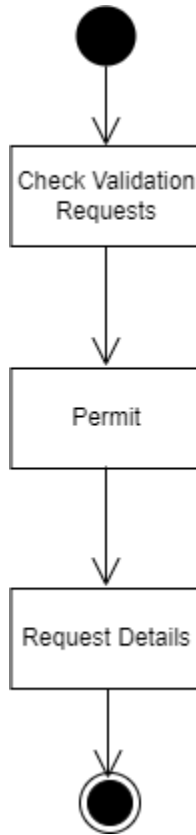
Figure: Activity Diagram of Check validity

3.4.7. Add medicine

Figure: Activity Diagram of Add medicine

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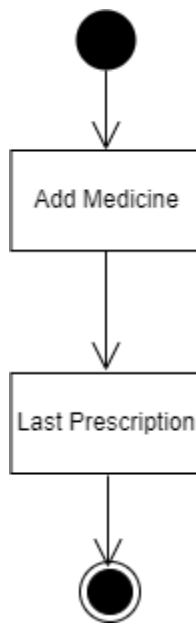
3.4.8. Add medical record

Figure: Activity Diagram of add medical record

3.4.9. Add prescription
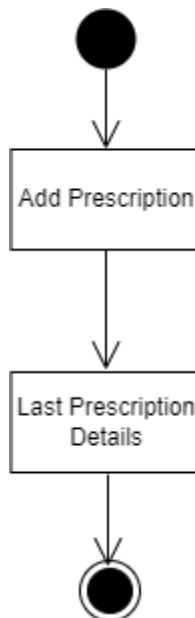
Figure: Activity Diagram of add prescription

3.4.10. Add test report
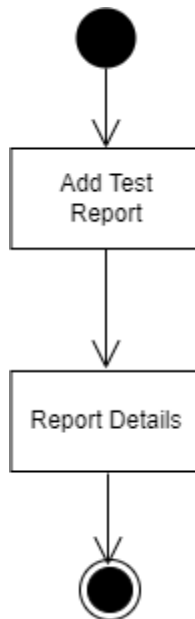
Figure: Activity Diagram of add test report

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3.4.11. Aggregate surveillance report
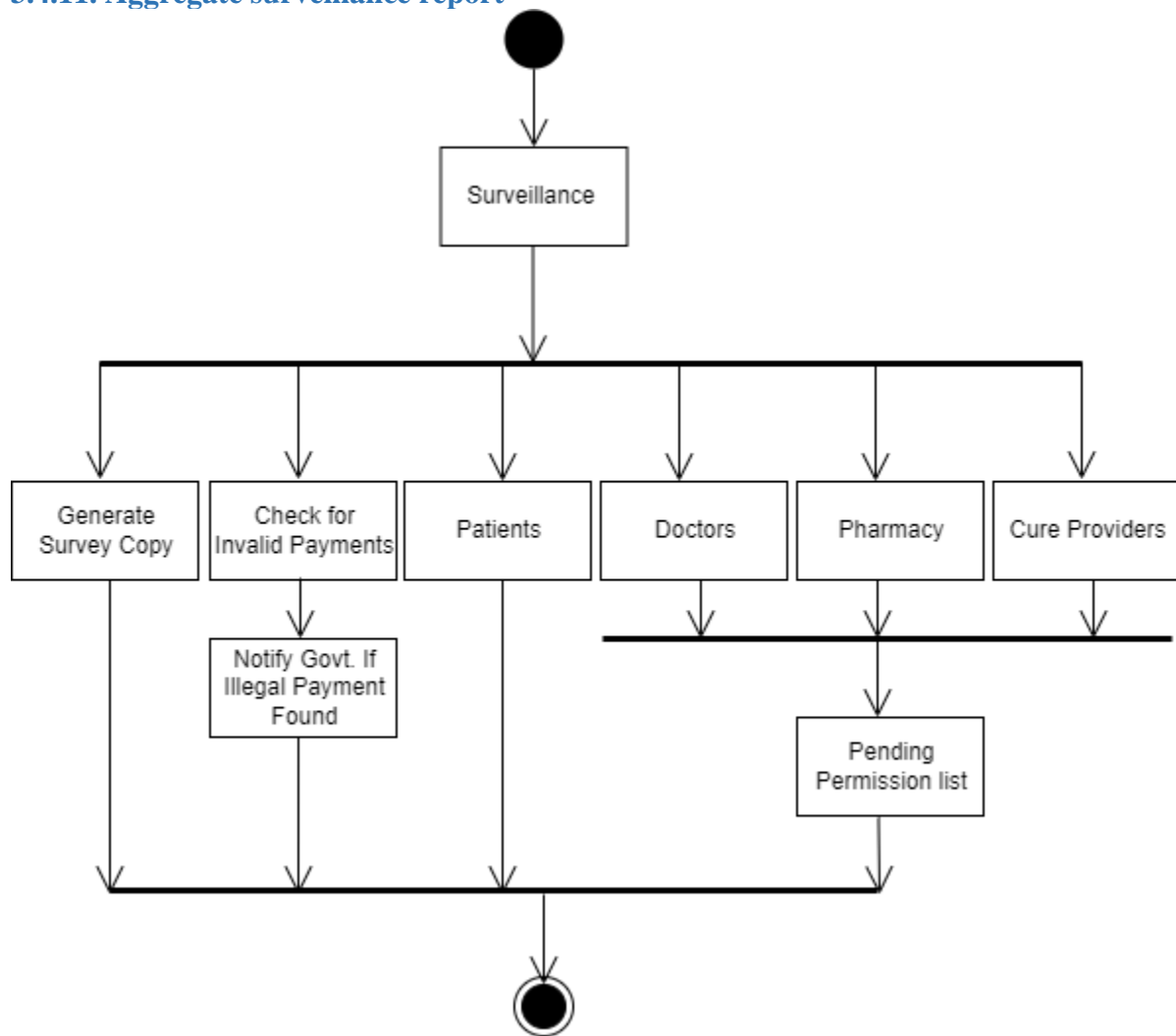
Figure: Activity Diagram of surveillance report

3.5. Sequence diagram

3.5.1. Sign Up

Figure: Sequence Diagram of Sign up

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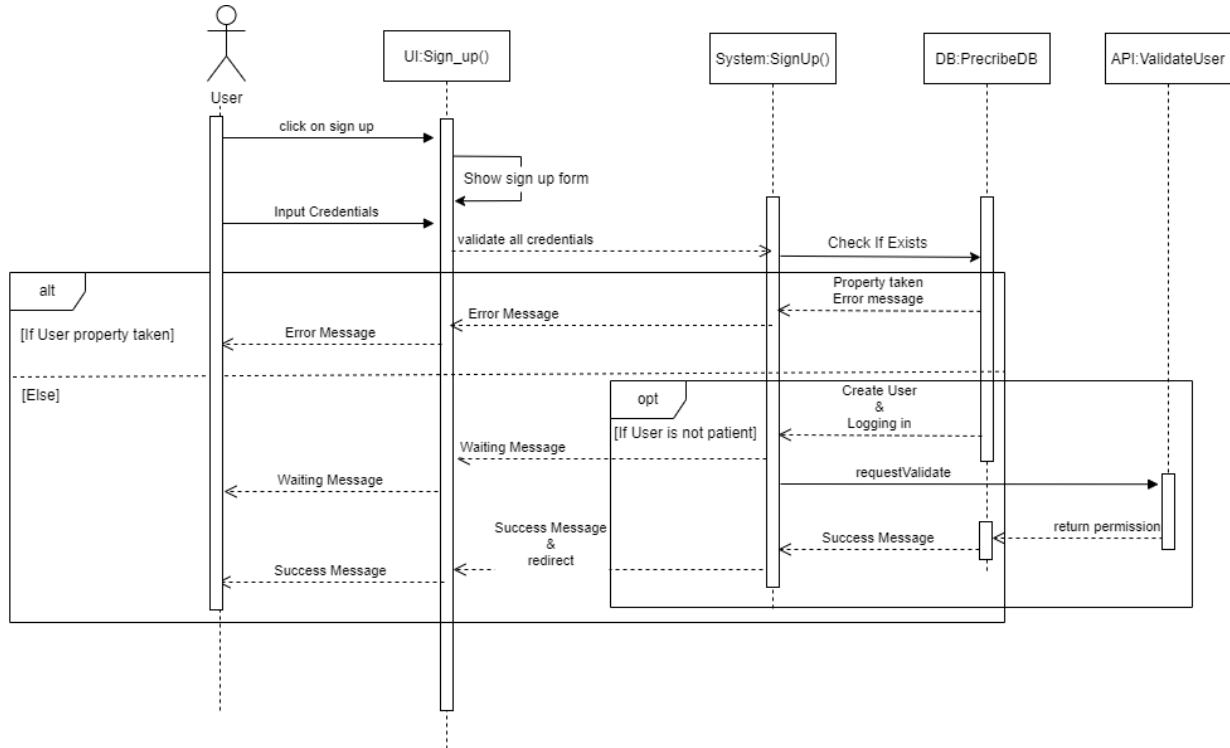
3.5.2. Sign in
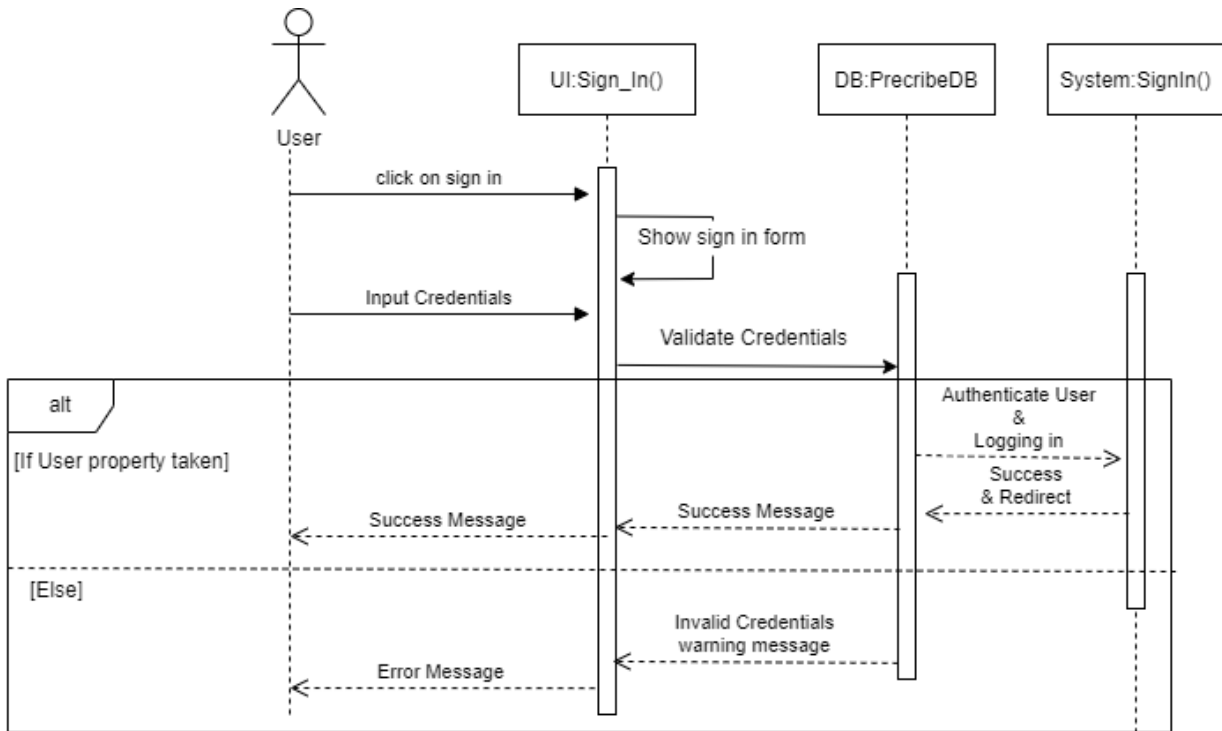
Figure: Sequence Diagram of Sign in

3.5.3. Make appointment

Figure: Sequence Diagram of make appointment

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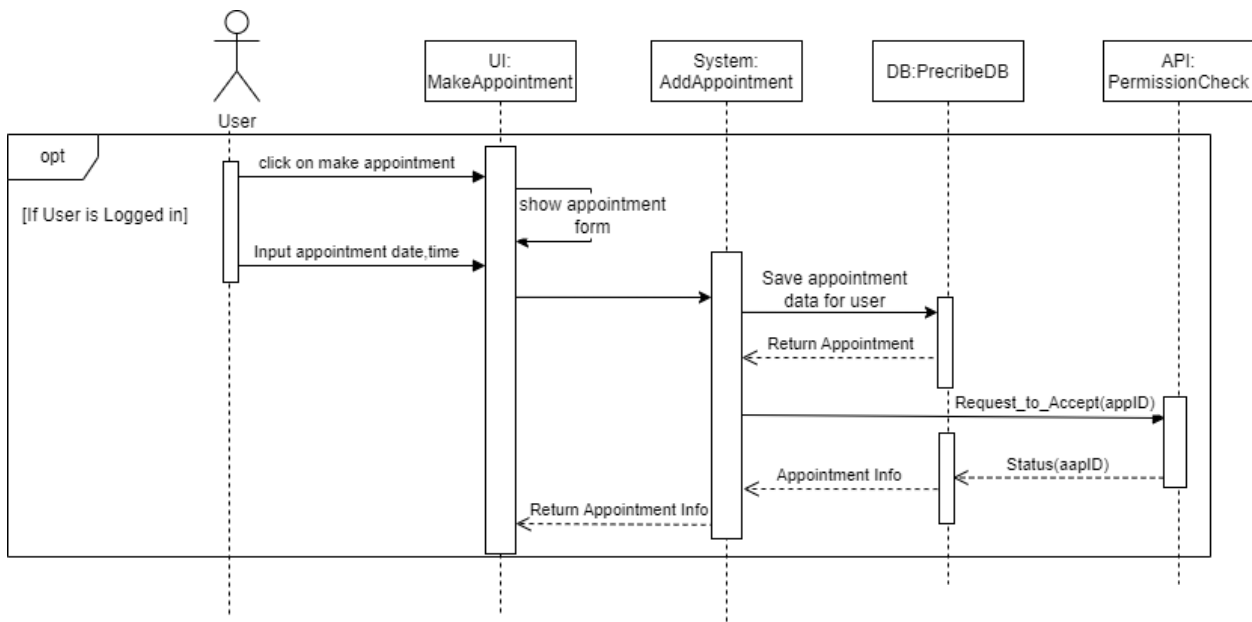
3.5.4. Add prescription
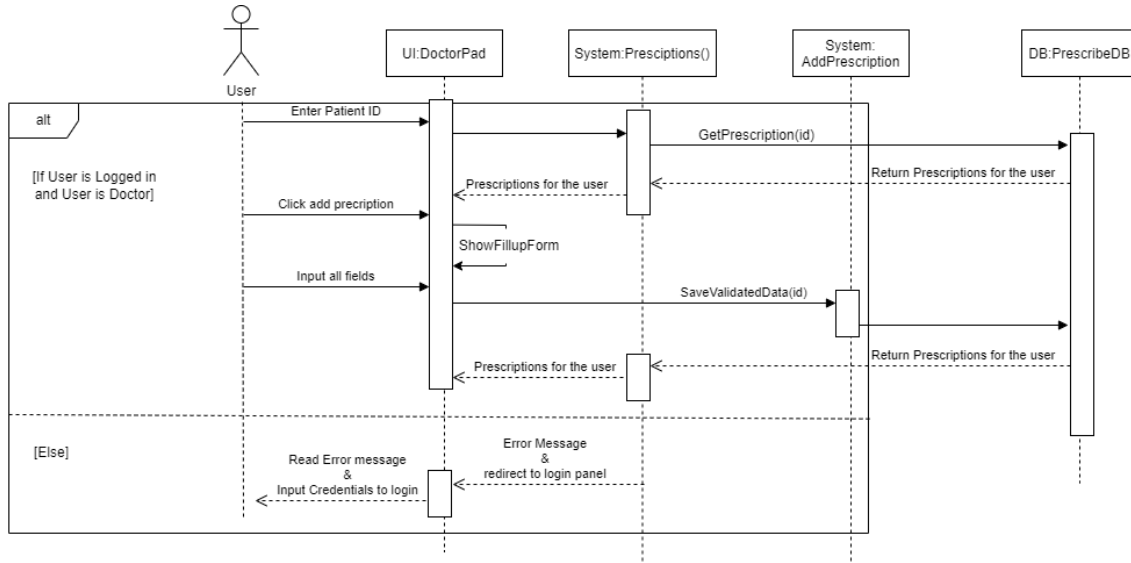
Figure: Sequence Diagram of add prescription

3.5.5. Add lab report
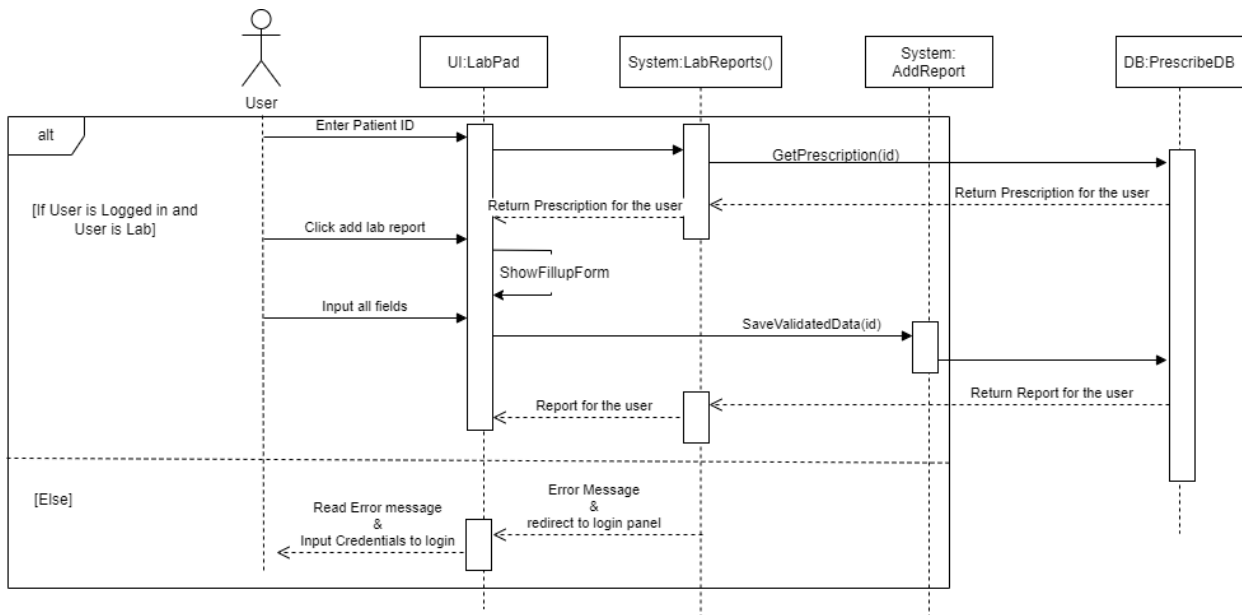
Figure: Sequence Diagram of lab report

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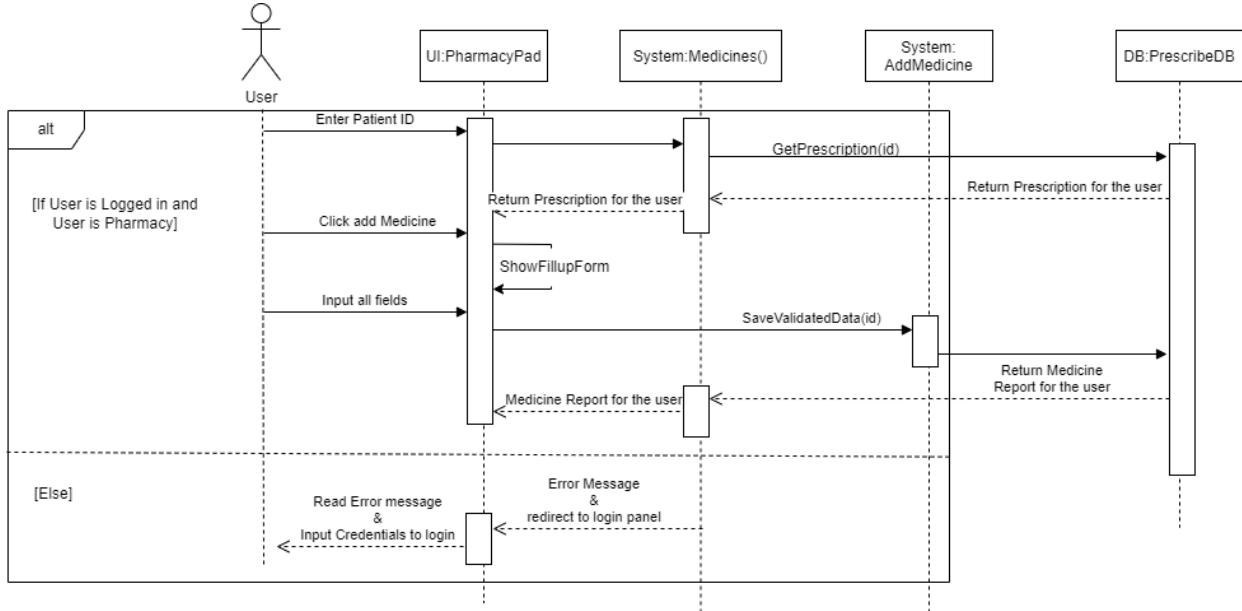
3.5.6. Add medicine

Figure: Sequence Diagram of add medicine

3.5.7. Add medical record
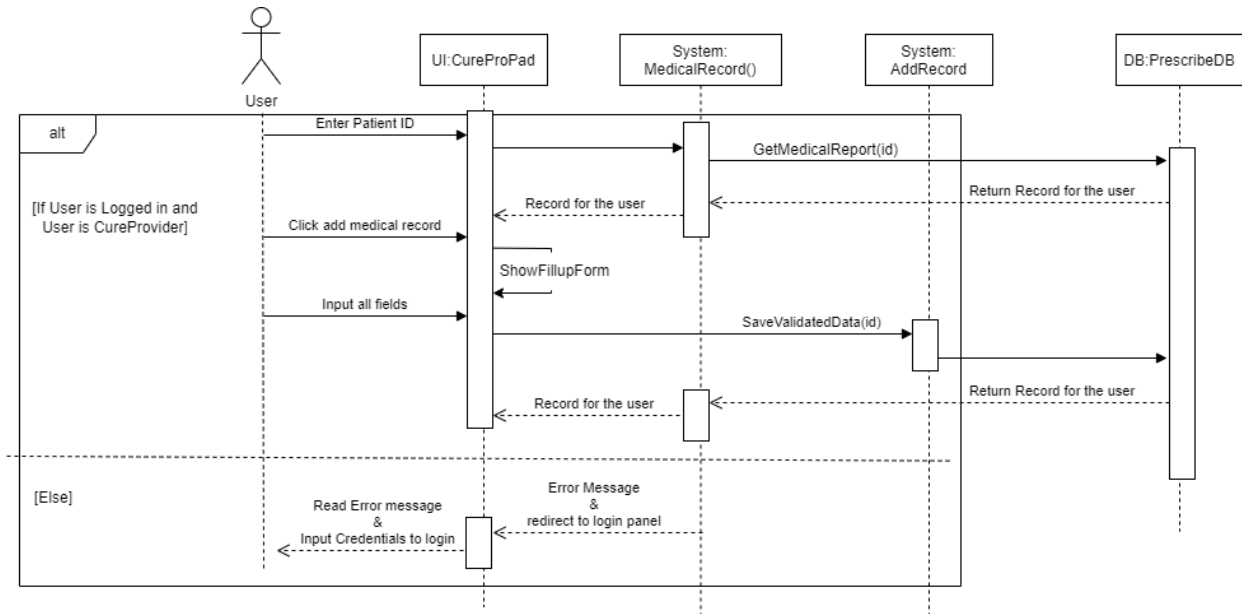
Figure: Sequence Diagram of medical record

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3.5.8. Make Appointment
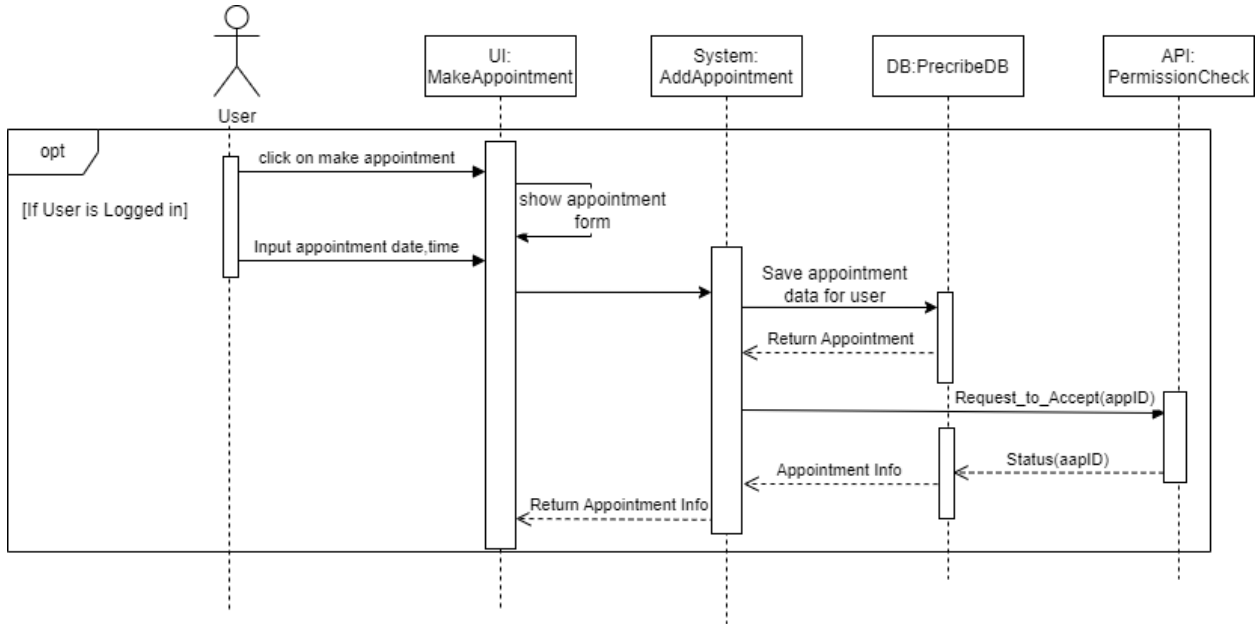
Figure: Sequence Diagram of make appointment

3.5.9. User profile
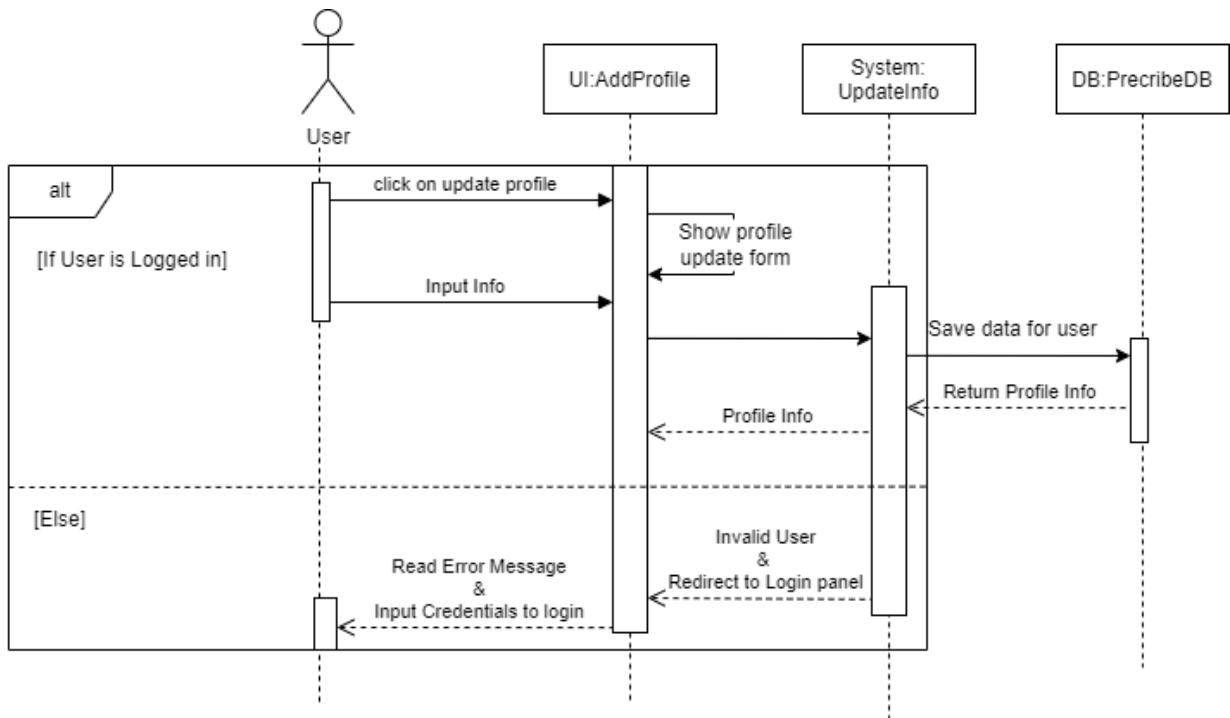
Figure: Sequence Diagram of user profile

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3.5.10. Post
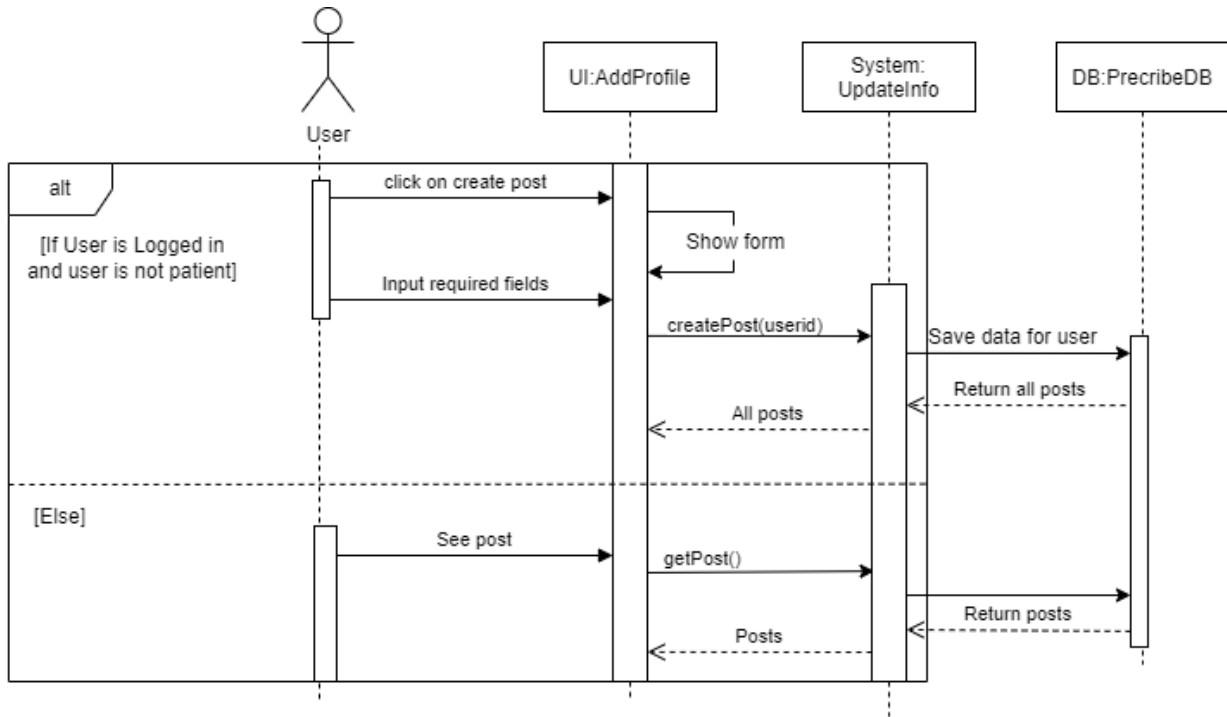
Figure: Sequence Diagram of post

3.5.11. Medicine validity
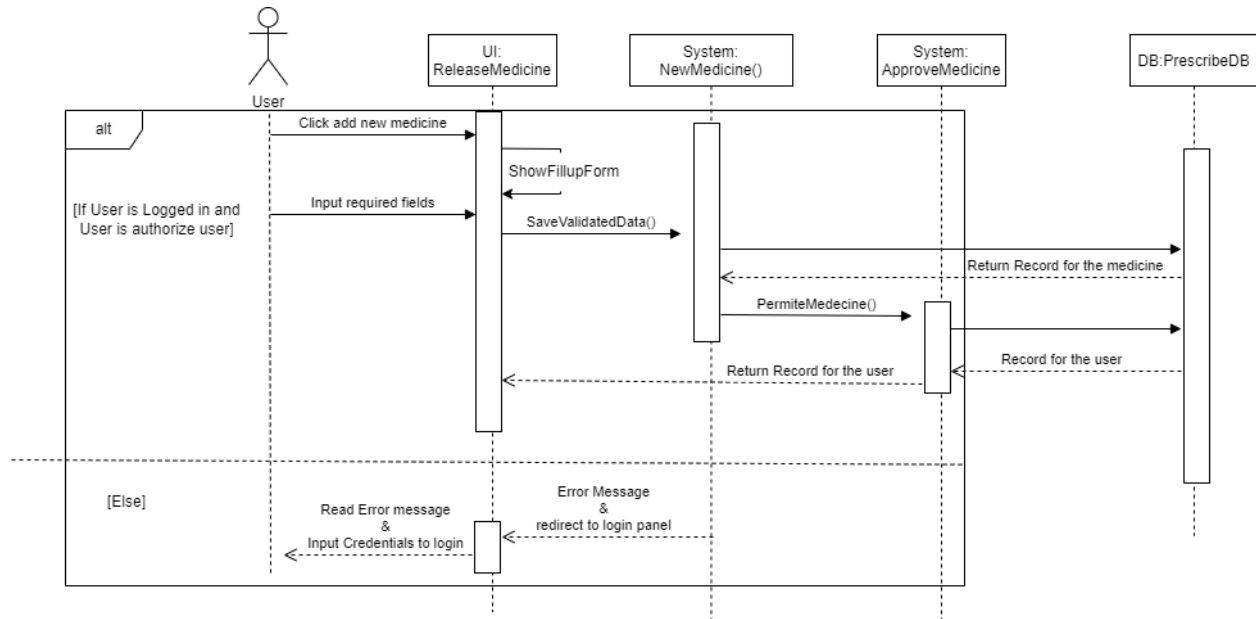
Figure: Sequence Diagram of medicine validity

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3.5.12. Surveillance

Figure: Sequence Diagram of Surveillance

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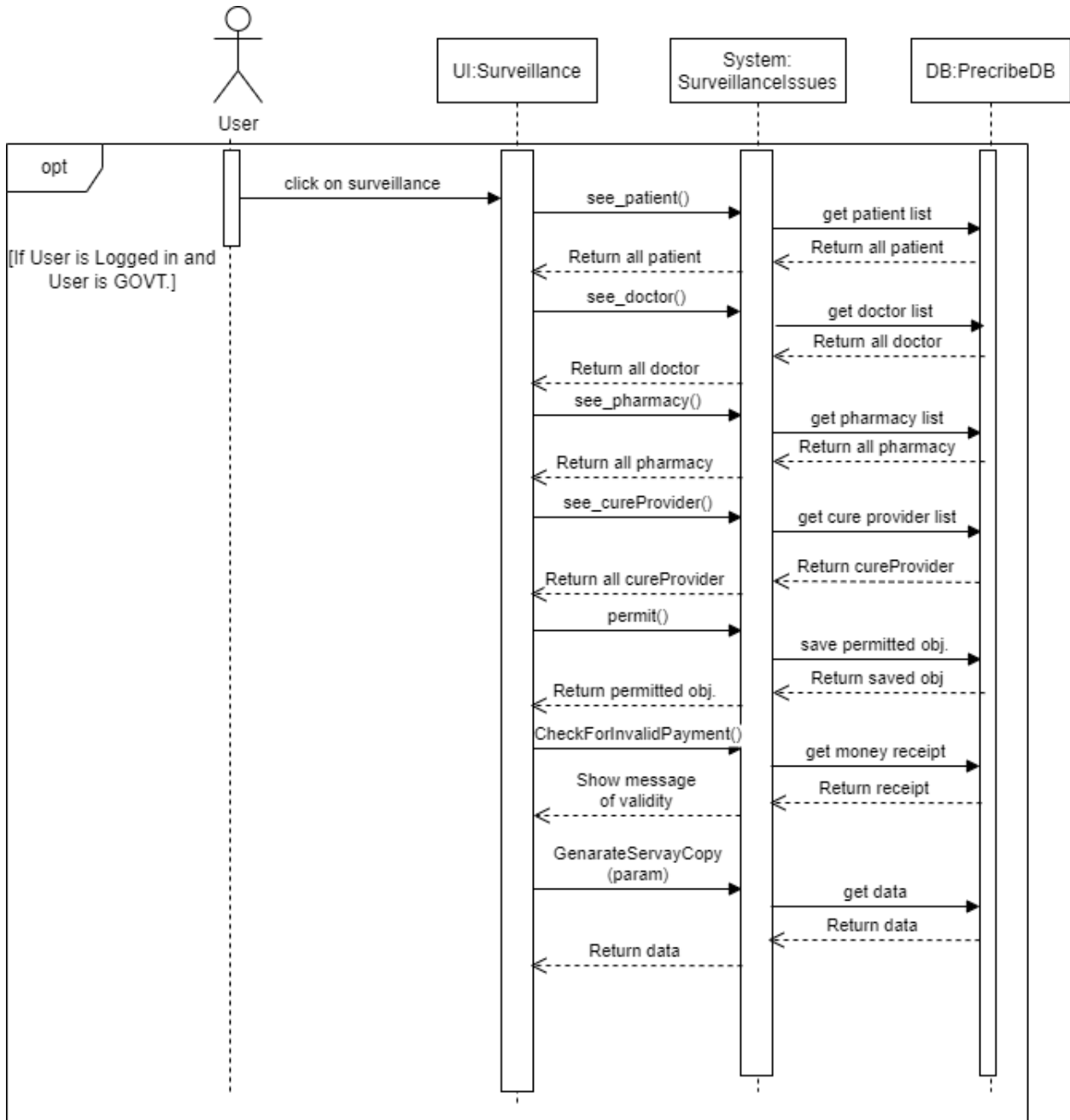
3.6. Entity Relationship Diagram
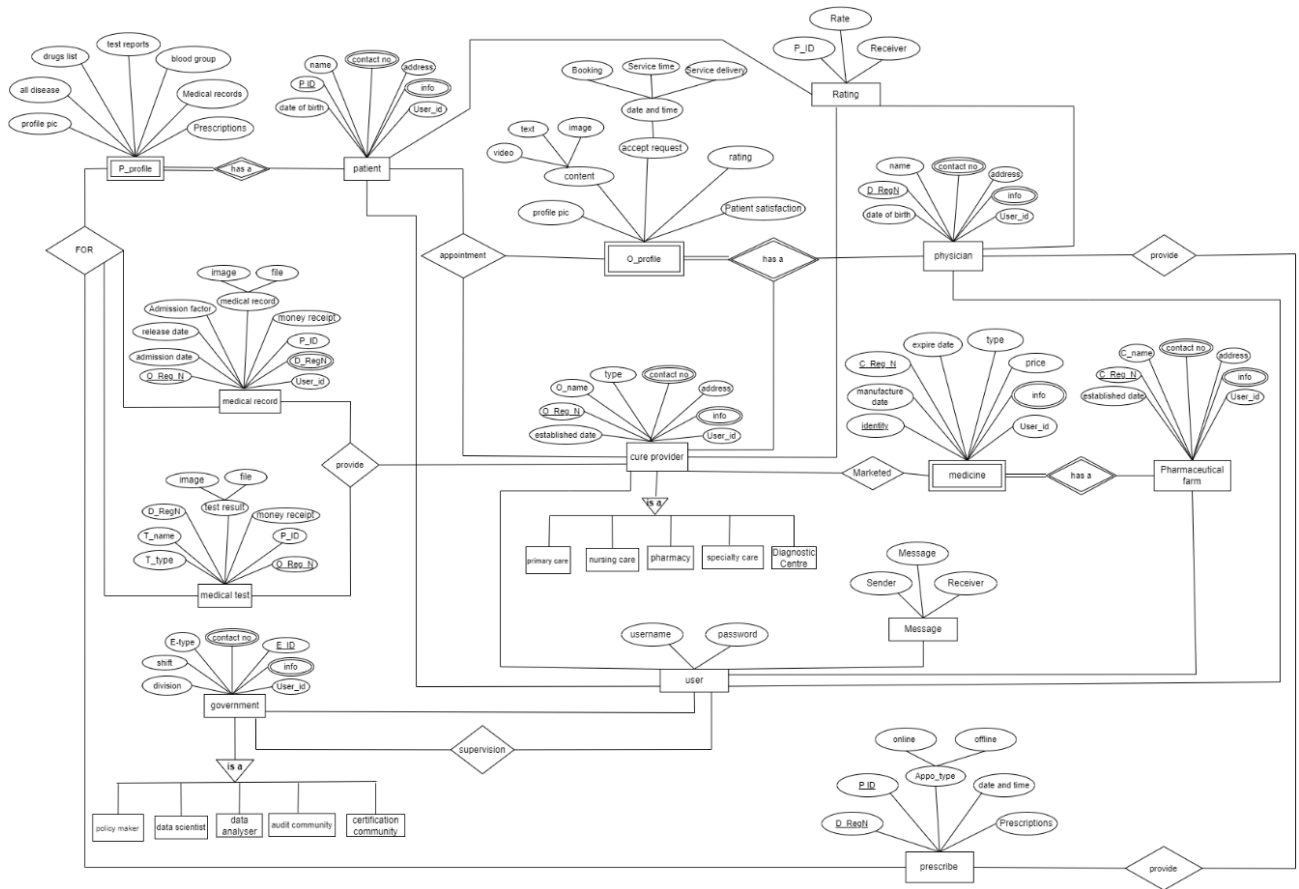
Figure: Entity Relationship Diagram

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CHAPTER 4: UI & USER MANUAL

4.1.   Homepage

4.2.   Sign in

4.3. Sign in

4.4. Sign up

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4.5.   Sign up

4.6.   Sign up

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4.7.   Sign up

4.8.   Sign up

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4.9.   Sign up

4.10.   Profile

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4.11. Post list

4.12. Post details

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4.13. Search result page

4.14. Search result page

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4.15. Doctor details

4.16. Doctor details

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4.17.   Doctor details

4.18.   Doctor dashboard

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4.19. Post create

4.20. Profile details & update

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4.21. Password change

4.22. Dashboard

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4.23. Add Prescription

4.24. Dashboard

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CHAPTER 5: CONCLUSION

5.1.Software specification:

OS		Windows,7- 11, Linux		
UI		HTML, CSS, JS, Django template		
	Frameworks	Bootstrap5.4,		
Back End		Python	Django==4.1.3	Django-cleanup==6.0.0
		Pillow==9.3.0	Asgiref==3.5.2	Sqlparse==0.4.3
		forms==1.14.0	Django-crispy-Tzdata==2022.6	Pip 3.10
Database		MySQL database		
Text Editor		PyCharm, VS code		

5.2.Hardware specification:

Hardware specification	processor 1.6 GHz or faster process, RAM 1.5 GB

5.1.Future Scope

In the future we can enjoy more advanced benefits through this system. For example, how much antibiotic medicine a patient has consumed or how much medicine a patient has consumed in different categories, we can get that information through this system. We can get specific results about when the prevalence of a disease is increasing or decreasing. Based on the prevalence of the disease, it is different. Regions can have different health plans, can keep special preparations. This application will ensure virtual medical services. It will provide accurate information about when the prevalence of a disease is increasing and decreasing. It will provide accurate information about the percentage of a disease. It will ensure the environment for doctors to work together to solve medical crises. It will play a helpful role in the management of the clinic. It will create mutual relationship between patients, doctors, pharmacists, researchers and all medical departments.

5.2.Economic context

As a result of storing and providing all the information of the patient, doctors will spend less time and less effort in the diagnosis of the patient. At the same time, the patient will not have to spend extra money for medical tests and various data.

After activating the system, we can earn or recover from the system through AdSense the money that will be spent for the maintenance and operation of the system.

5.3.Reference:

[a-1: {19 September 2021, dailynayadiganta}]

[a-2: {16 February 2017, jugantor}]

[b-1: {Wednesday, July 4, 2018 00:00 Bangladesh Pratidin}]

[b-2: { banglatribune : 16 November 2020, 14:00 }]

[c-1: { Ten Years of the e-Health System in Estonia, Janek Metsallik1 , Peeter Ross1 , Dirk Draheim2 , and Gunnar Piho2}]