

Laboratory Manual

For

Software Engineering

(CT 616)

B.Tech (IT)

SEM VI



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PROJECT OVERVIEW

Title: Integrated Care System

Purpose: Clinic 24/7 – Doctor at Doorstep

A Multi-speciality Online Hospital created as a vision, to provide 24/7 Primary Care at Doorstep of Patients using a panel of high quality doctors. Further, it provides quality medicines with help of authorized Pharmacies at the door-step at discounted prices as well as gives a door-step Laboratory services. The aim is to help elderly and infirm people as well as people who need regular monitoring services to get access to quality healthcare services at affordable prices at the Door-step.

Description:

‘Integrated Care System’ is based on concept of online virtual clinic/hospital. Users for the systems are Doctors, Patients, Labs and Chemists. A patient will make his/her consultation request to the system by entering the symptoms; the system forwards the consultation request to a doctor of the concerned speciality. Doctor generates a prescription comprising of Diagnosis, Medicines and Lab Requests (if needed) based on the symptoms provided by the patient. The prescription is received by patient, nearest local chemist and nearest local lab. Using the prescription Chemist provides medicines to the patient via offline delivery. Labs, too, use the same prescription to collect specimen from patient and make the delivery of lab reports based on lab tests and also update the report on the system to view for the patient anytime. For Chemists and Labs, only need to know information will be displayed thereby protecting the Patient’ confidentiality.

EXPERIMENT-1

Aim: To perform the system analysis: Requirement analysis, SRS

Tools/ Apparatus: None.

➤ **Functional Requirements**

1. Maintain Specialities

1.1 Add Speciality

Input: Doctor provides their Specialities.

Output: Database will be updated.

Description: Add a new (unique) Speciality.

1.2 Edit Speciality

Input: Provide modification to existing Specialities.

Output: Database will be updated.

Description: View and Update the details of an existing Speciality.

1.3 Delete Speciality

Input: Erase the speciality with no doctors attached.

Output: Database update with Speciality removed.

Description: Delete the Speciality - A Speciality can be deleted only if no doctors are attached to it.

2 Maintain Doctors

2.1 Add Doctor

Input: Doctor will provide their Name, Age, Sex, Qualification, Experience, Speciality.

Output: Updated database. Associate doctor with entered speciality. Unique profile Id & Dashboard for doctor.

Description: Add a new (unique) Doctor.

2.2 Edit Doctor

Input: Update the details of an existing Doctor.

Output: Updated Doctor's profile.

Description: Update the details of an existing Doctor - Speciality cannot be updated i.e. a doctor cannot move from one speciality to another.

2.3 Delete Doctor

Input: Doctor/Admin deletes the profile.

Output: Updated Database.

Description: Delete the Doctor Details - A doctor can be deleted if and only if no new Patient Consultation Request is pending

3 Maintain Chemist & Labs

3.1 Add Chemist/Lab

Input: Authorized Chemist/Lab adds their details.

Output: Updated Database. A unique Id and profile is created.

Description: Associates location Pincode that will help Patient to find nearest Chemist/Lab.

3.2 Edit Chemist/Lab

Input: Update the details of an existing Chemist.

Output: Updated Database.

Description: View and Update existing Profile.

3.3 Delete Chemist/Lab

Input: Chemist/Lab or Admin deletes the Profile.

Output: Updated Database with Chemist/Lab removed.

Description: A Chemist or a Lab can be deleted if and only if no new Prescription is pending.

4 Maintain Symptoms

4.1 Add Symptom

Input: Add a new symptom with cause and details of problem.

Output: Associate the symptom with possible cure and/or speciality of doctor.

Description: Helps Patient to find appropriate Doctors.

4.2 Edit Symptom

Input: Update details of existing symptoms.

Output: Updated database.

Description: symptoms description should be kept up-to-date.

4.3 Delete Symptom

Input: Delete the symptoms details.

Output: Update database with removal of Symptom.

Description: A Symptom can be deleted if and only if no Consultation request ever raised has used this symptom.

5 Maintain Patients

5.1 Create Patient

Input: Patient add their details – age, gender, name etc. and register themselves.

Output: A new Profile for patient where details of every activity will be logged along with diagnosis.

Description: Patient registers for first time and get to login other time.

5.2 Edit Patient Profile

Input: Update details of an existing patient.

Output: Updated database.

Description: Latest Details should be maintained.

5.3 Delete Patient Profile

Input: Patient/Admin deletes the patient profile.

Output: Removal of Patient profile from database.

Description: Profile will not get deleted in case of pending payments or consultation request.

6 Consultation Request

6.1 Create Consultation Request

Input: Patient enters the Symptoms, uploads reports, if any and defines the mode of request (Offline/Online).

Output: Schedules Appointment with appropriate doctors and notifies both Patient and Doctor of Appointment.

Description: Required Details and medical history of Patients profile are attached to this request.

6.2 Create Appointment – Online

Input: Patient request for online consultation.

Output: Entry created in Patient appointment file based on timings from selected Doctors' profile.

Description: Scheduling is possibly quicker.

6.3 Create Appointment – Offline

Input: Patient request for offline consultation.

Output: Entry created for Patient appointment file in Receptionist Appointment Register and schedules an offline visit based on visiting hours.

Description: Scheduling is possibly quicker.

7 View/Generate Prescription/ Print Invoice

7.1 Patient control

Input: Selects view/generate/print - prescription/invoice.

Output: Performs selected task and output accordingly.

Description: well-designed GUI that is easy to use.

7.2 Admin control

Input: Selects Email/print - prescription/invoice.

Output: Performs selected task and output accordingly.

Description: Admin/System can email patients as reminder of pending invoice/prescription task.

8 Reports

8.1 Doctors Prescription

Input: Doctor prescribes for specific lab test report.

Output: Notifies Patient and Appropriate Lab for the Test.

Description: Patient can accept/deny to test with suggested Laptop.

8.2 Lab fulfills request

Input: After patient accepts for lab test and collection and testing of specimen. Lab uploads Report.

Output: Report is added to Patient profile & appointment is schedule with doctor on Patient agreement.

Description: Online availability of reports – the quick and safe way.

9 Login

Input: User will provide email, password; if he/she already has the account

Output: User will be allowed to login.

Processing: Checks for the correct username and password.

10 Logout

Input: User clicks on logout button.

Output: Successful logout from user's account.

➤ Non-Functional Requirements

1. Performance Requirements

At the peak, system should be able to scale to 10,000+ users (patients) concurrently. The following processes are critical and must respond as per below

- Patient Registration ≤ 4 seconds
- Patient Consultation Requests ≤ 2 seconds
- Chemist - Prescription Requests ≤ 2 seconds
- Labs - Lab Requests ≤ 4 seconds
- Patient - Prescription & Invoice Look-up ≤ 4 seconds

Further, since the system needs to be designed for 24/7 Operations hence the Availability should be. The system data shall be backed up every night (full back-up) with a cycle of 30 days. This essentially means that there will be a provision to rollback by a month. Post back-up, every day the back-up shall be restored on a dummy production system to ensure completeness and correctness of back-up.

2. Safety Requirements

As the Patient's data is highly confidential and private care would be taken to ensure that the confidentiality is maintained. Only authorized Hospital staff i.e. Doctors will have the access to patients' consultation requests. Also, Chemists and Labs will be shown data only on need to know basis.

3. Quality Attributes

The Key Software Quality Attributes are Availability, Reliability and Usability.

- High availability of system
- Highly reliable security for data.
- Easy to use for every age group.

EXPERIMENT-2

Aim: To perform the function oriented diagram: DFD and Structured chart

Tools/Apparatus: Visual Paradigm.

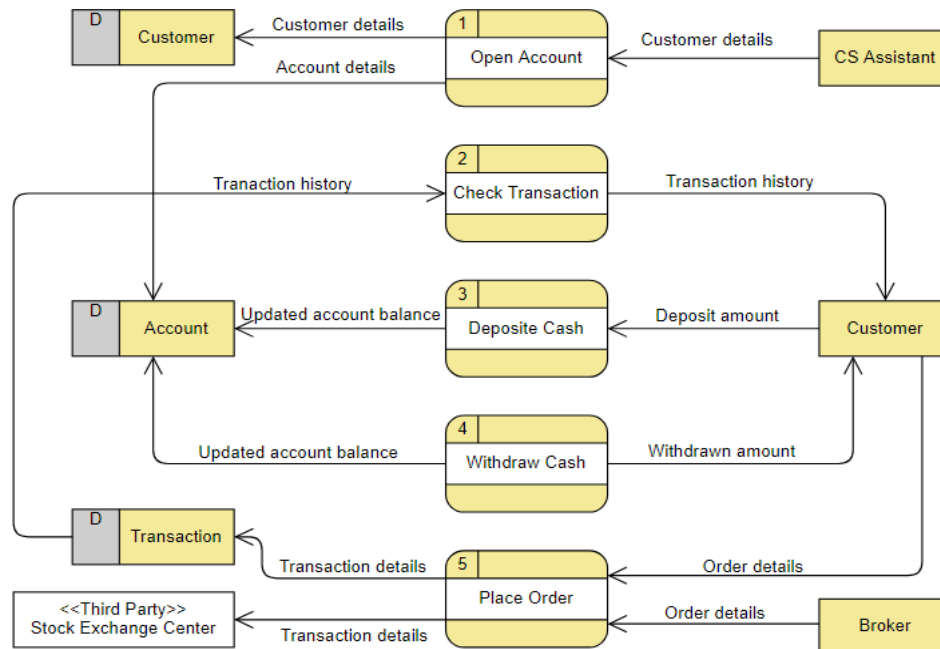


Figure 1 : Stock Exchange Transaction (DFD Example)

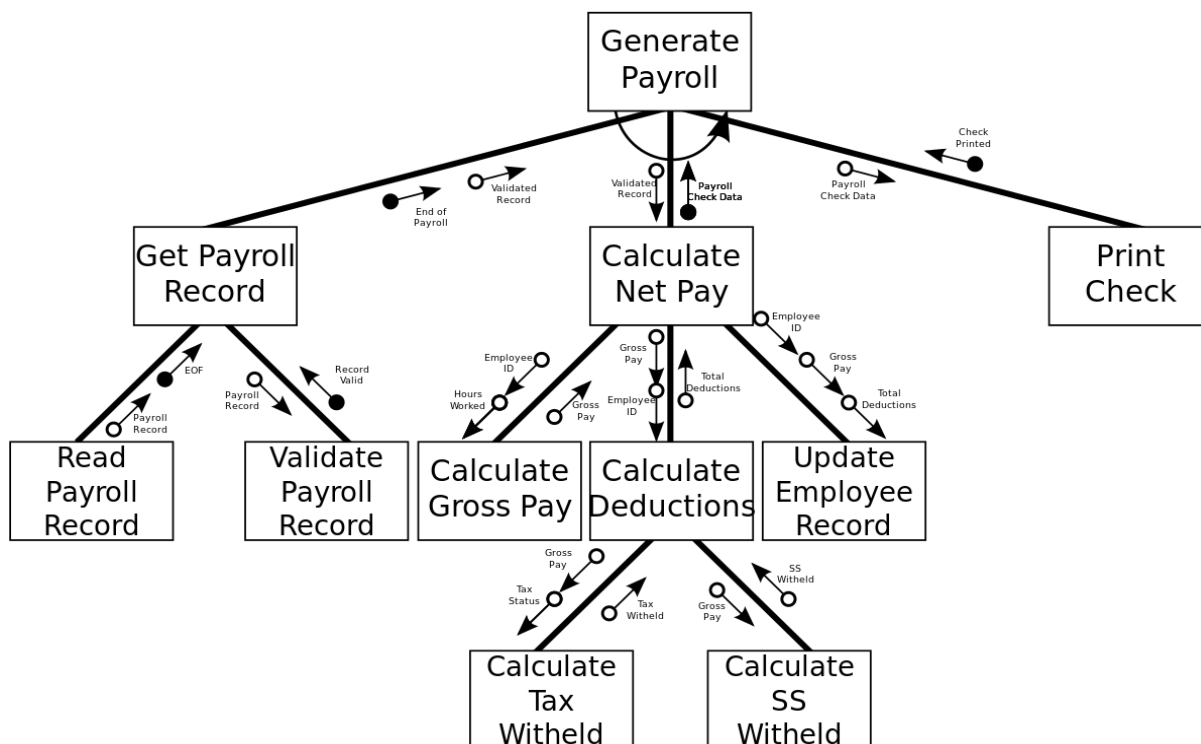


Figure 2: Structured Chart Example

EXPERIMENT-3

Aim: To perform the user's view analysis: Use case diagram

Tools/Apparatus: Visual Paradigm.

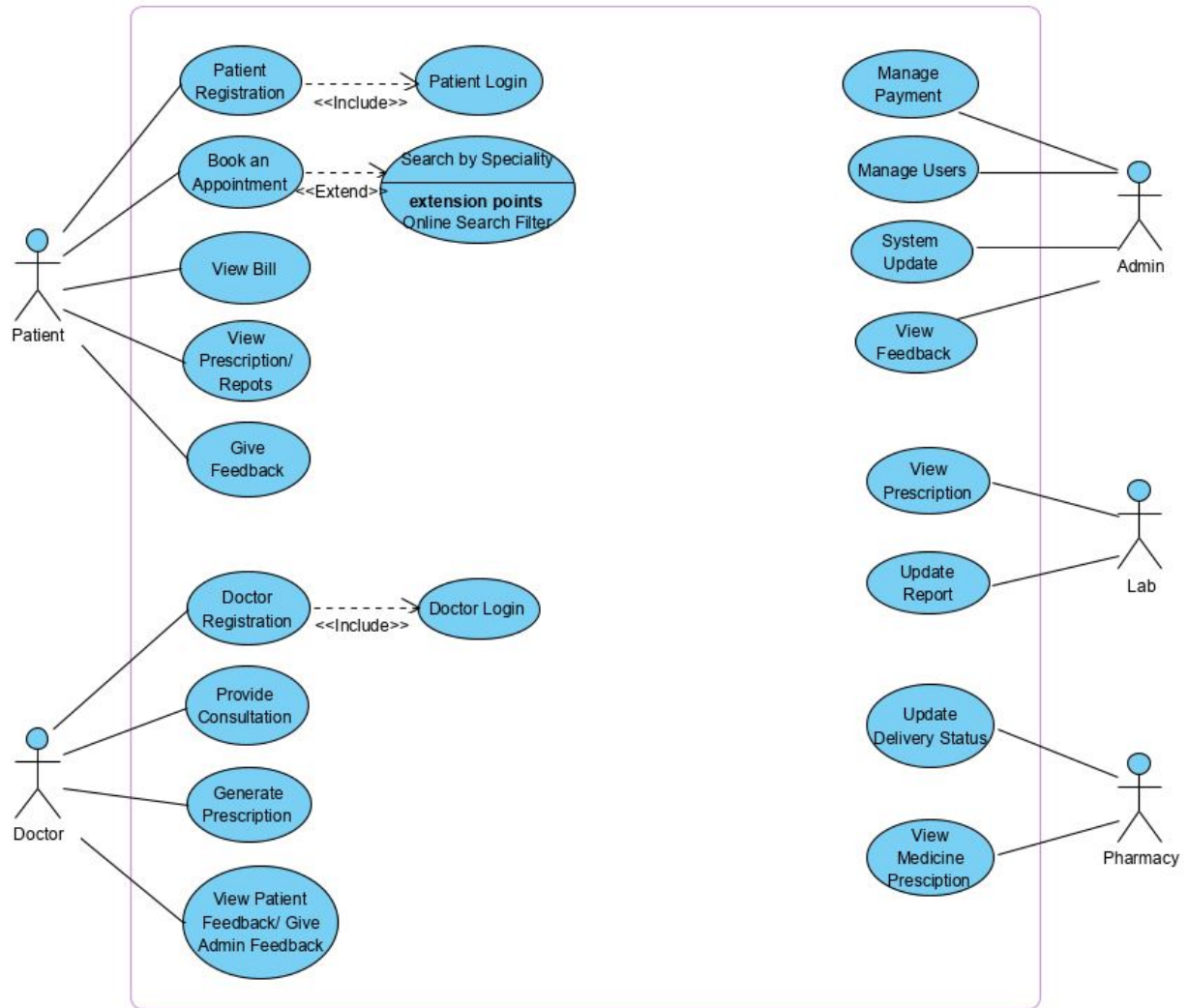


Figure 3: Integrated Care System (Use Case Diagram)

EXPERIMENT-4

Aim: To draw the structural view diagram: Class diagram, object diagram

Tools/Apparatus: Visual Paradigm.

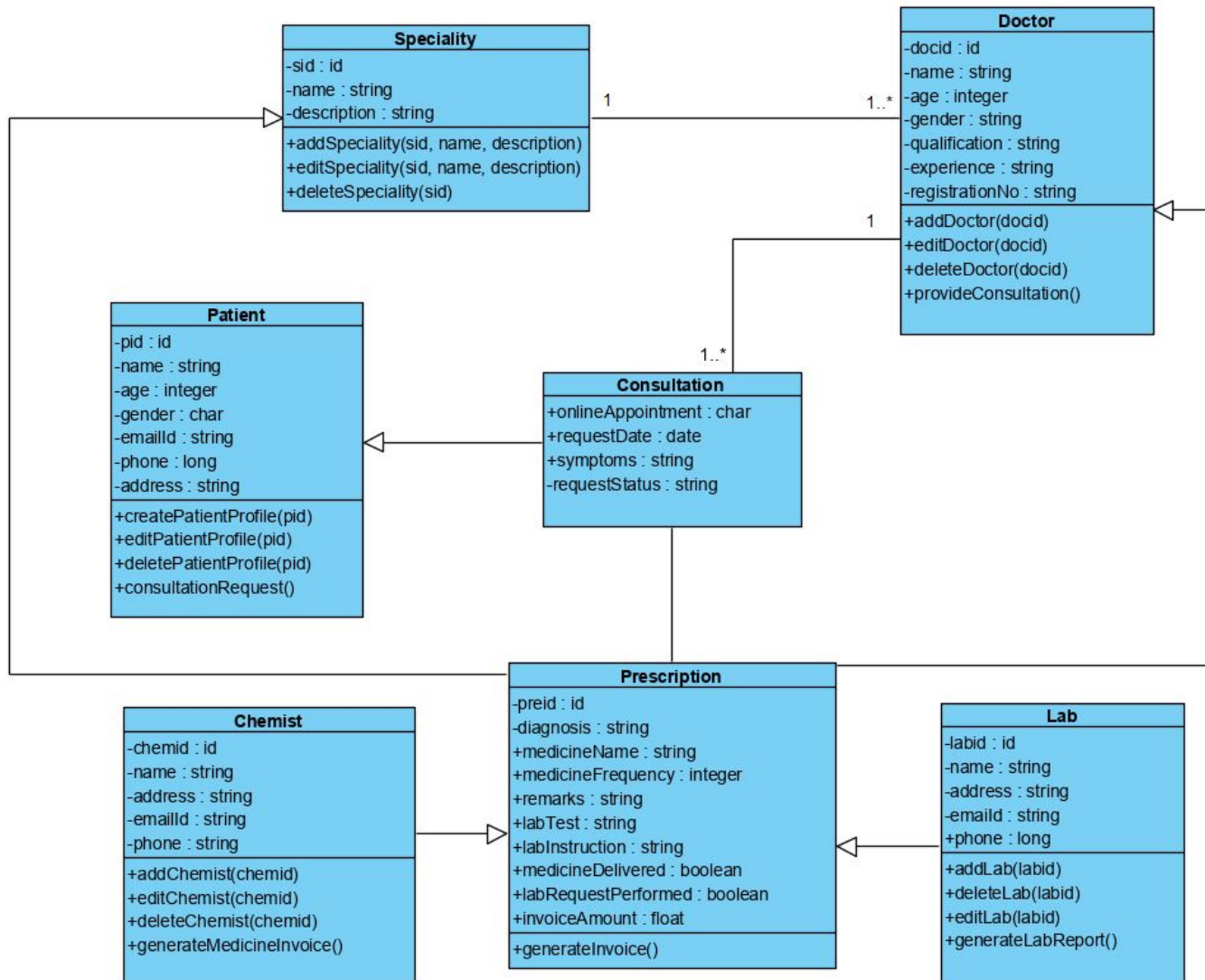


Figure 4: Integrated Care System (Class Diagram)

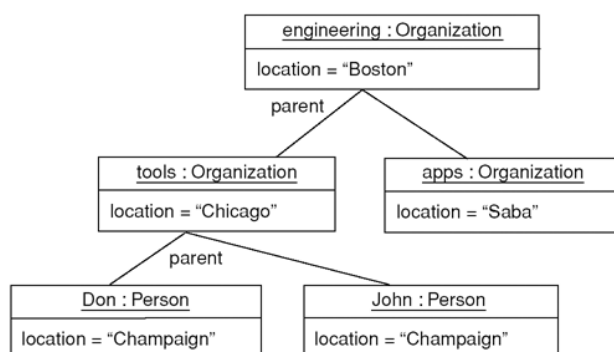


Figure 5: Object Diagram Example (ref. UML DISTILLED)

EXPERIMENT-5

Aim: To draw the behavioral view diagram: Sequence diagram, Collaboration diagram

Tools/Apparatus: Visual Paradigm.

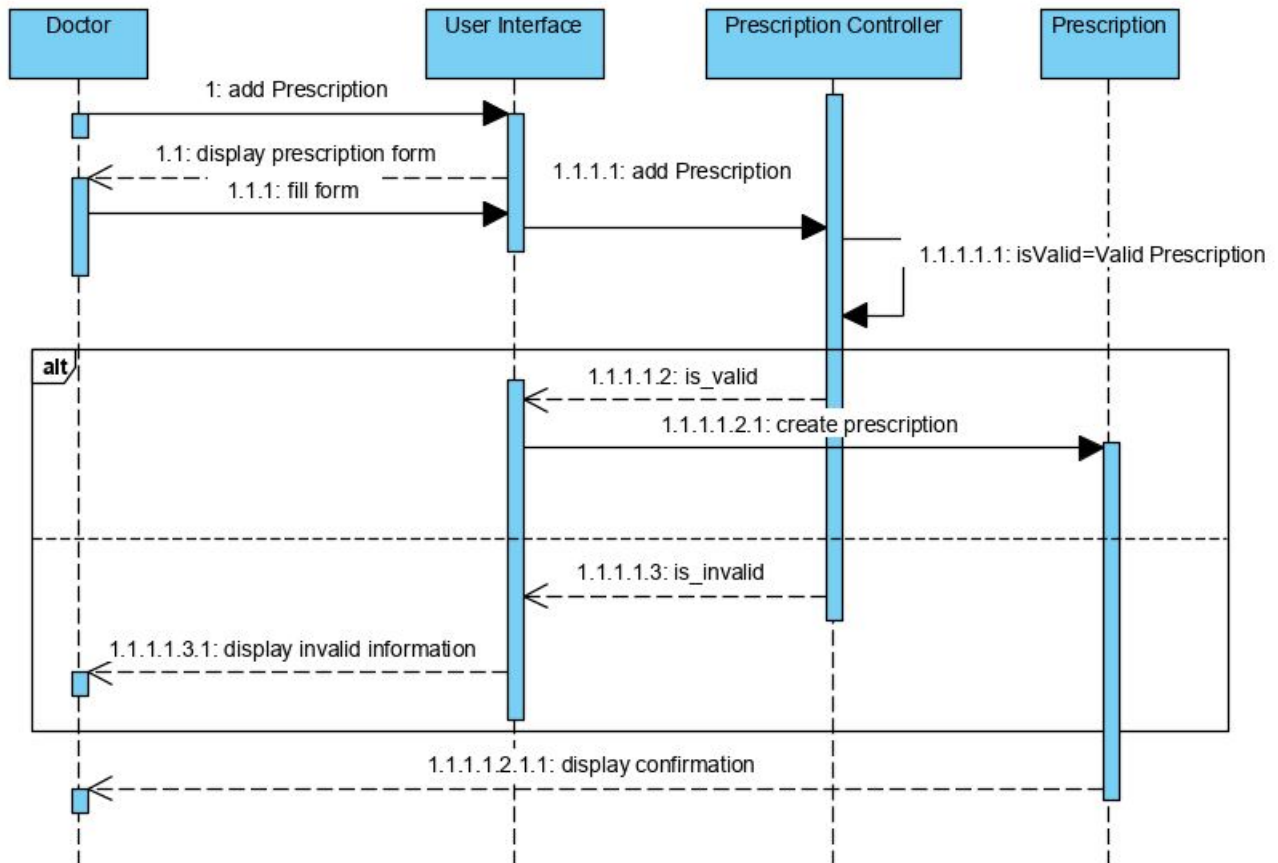


Figure 6: Prescription Generation Sequence Diagram

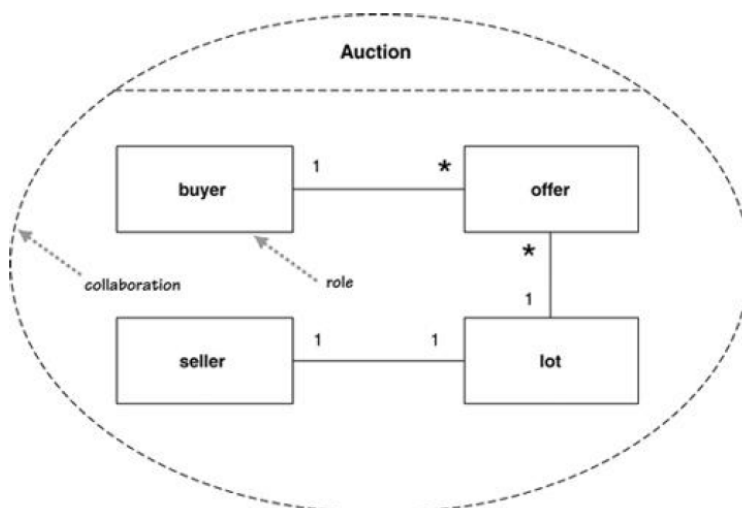


Figure 7: Object Diagram Example (ref. UML DISTILLED)

EXPERIMENT-6

Aim: To draw the behavioral view diagram: State-chart diagram, Activity diagram

Tools/Apparatus: Visual Paradigm.

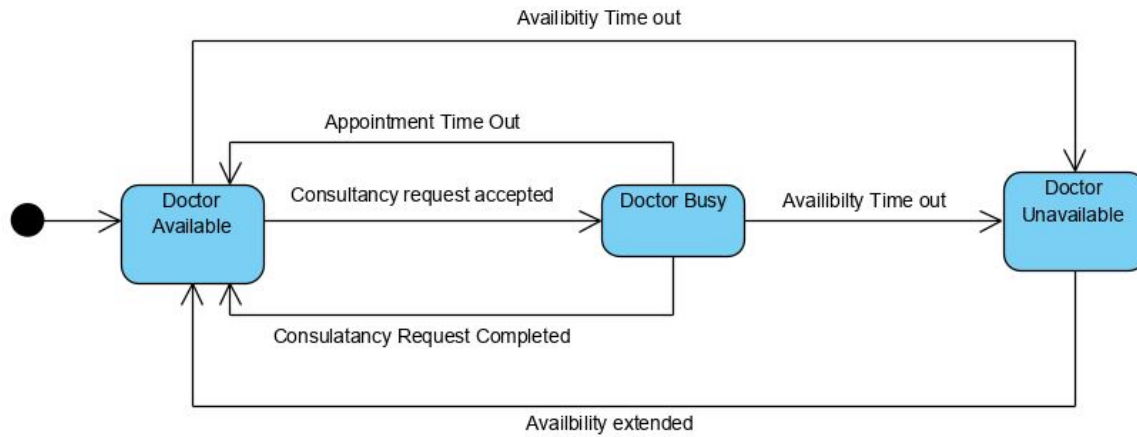


Figure 8: Doctor Availability State Diagram

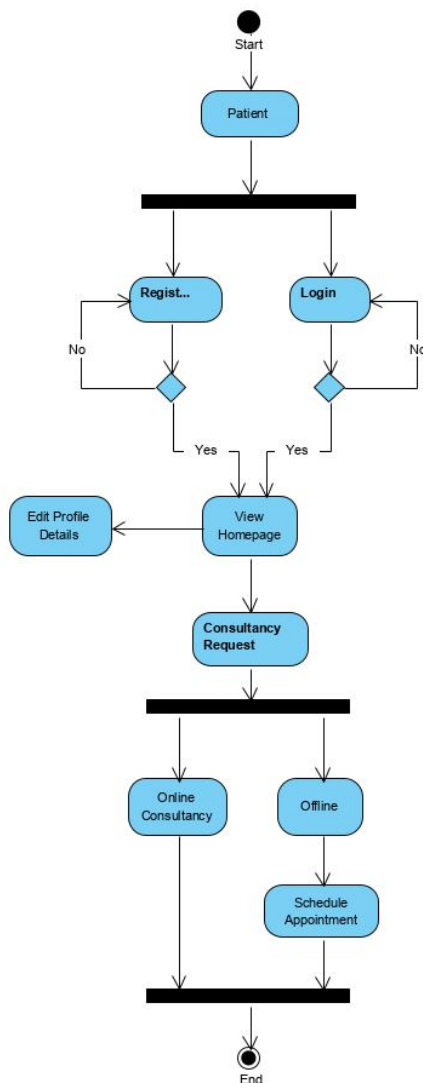


Figure 9: Consultancy Request Activity Diagram

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Head of the Department

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