

Software Engineering Lab Report II

Virtual Clinic

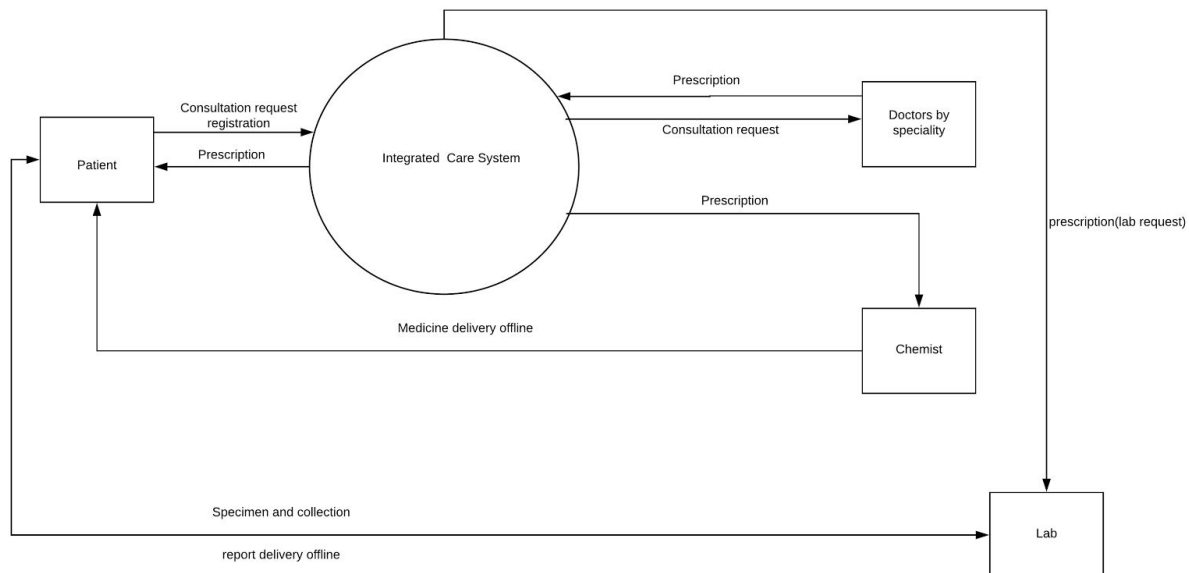
Mishal Shah - 16CO125

Samyak Jain - 16CO254

2nd February, 2018

1. Context Diagram

Context Diagram:

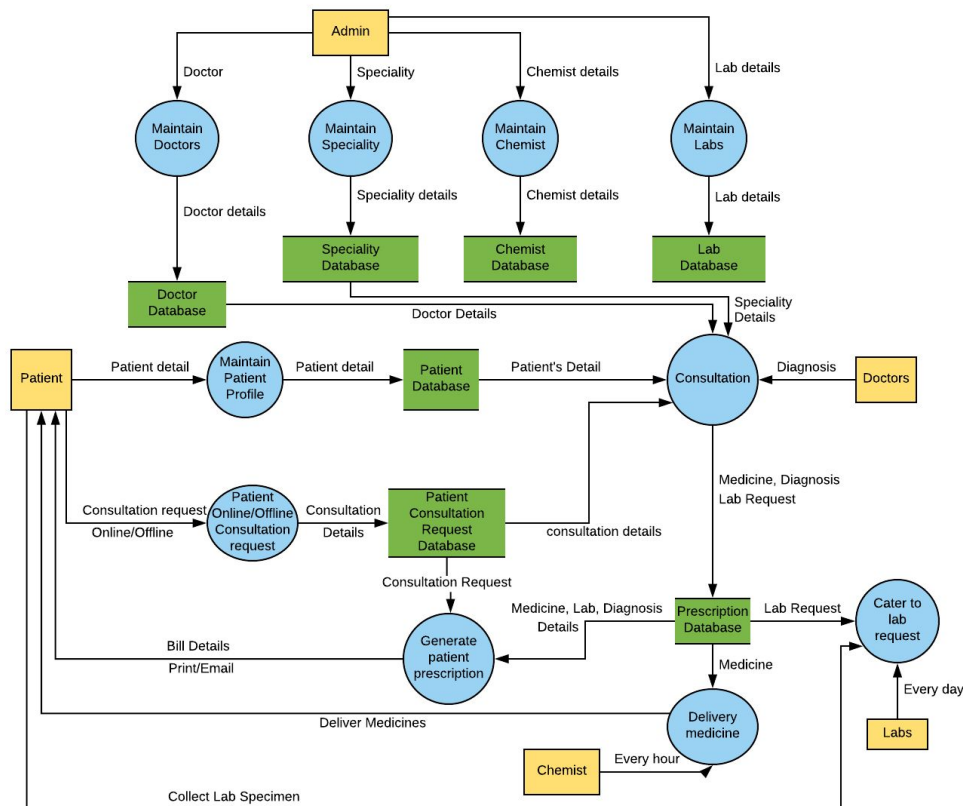


Description of the entire System:

"Virtual Clinic" is based on the concept of integrated care system. Stakeholders for the system are Doctors, Patients, Labs and Chemists. As shown in the above diagram a patient makes 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, localized chemist and localized labs. Using the prescription Chemists provide 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. For Chemists and Labs, only need to know information will be displayed thereby protecting the Patient's confidentiality.

DataFlow Diagram

DataFlow Diagram:



List of Entities:

The following are the Entities of the Integrated Care System:

E. ID	Entity Name	Description
E01	Admin	Admin is involved in adding doctors, labs, chemists and generating invoices/reports
E02	Patient	Patient is involved in maintaining his/her personal profile, making appointments and generating invoices/reports

E03	Doctor	Doctor is involved in looking after consultations, prescribing medicines, lab tests and viewing patients condition.
E04	Chemist	Chemist is involved in delivering the medicines prescribed by the doctor and updating the status for the patient.
E05	Lab	Lab is involved in performing lab tests and updating the results into the system

List of Data Stores

Data stores or databases are the places where data are stored and kept secured. All databases concerned with the project are listed below.

D. ID	Data Store Name	Description
D01	Speciality Database	Contains the data of speciality of doctors and description of the speciality
D02	Doctor Database	Contains the data of doctors
D03	Chemist and Lab Database	Contains information related to chemists and labs
D04	Patient Database	Contains the data of patients registered in the system
D05	Patient Consultation Request Database	Contains the data of the consultation requests made by patients
D06	Prescription Database	Contains the prescription of each consultation done by doctors. Prescription will contain diagnosis, medicines and lab requests, if needed

Note: Prescription database will be used by Chemists and Labs but data related to diagnosis and other information will be hidden from them. Only the information they require will be shown to them. Though separate real world entities, Chemist and Labs entities can be combined as the data maintained is of same type.

List of Processes

Processes are the activities by which the information or data in the system get processed from one form to other. All the processes concerned with the project are listed below and clearly described.

P. ID	Process Name	Description
P01	Maintain Speciality	Adds speciality and description for the available doctors in the hospital
P02	Maintain Doctors	Creates account for the doctors, to edit/delete a profile.
P03	Maintain Labs and Chemist	Creates account for labs and chemists
P04	Maintain Patient Profile	Creates account for patient, edit details.
P05	Consultation Request	Creates an offline/online consultation request which can be seen in doctors dashboard for further consultation
P06	Consultation	After successful consultation request, consultation takes between doctor and patient (offline/online) and necessary advice/medicine/lab test is told to be done
P07	Lab Request	If doctor prescribes lab test, then the lab-incharge performs the lab test and uploads the reports of the test.
P08	Medicine Delivery	The medicines prescribed by the doctor are successfully delivered by the pharmacist and status of delivery is updated
P09	Generate Patient Prescription/ report/invoice	Admin or Patient can anytime generate prescription,

		report/invoice
--	--	----------------

List of Data Flows

Data flows depict how various datas/information flow from one entity to a process or to a database and vice-versa. All the flow of information in project have been listed down and clearly described.

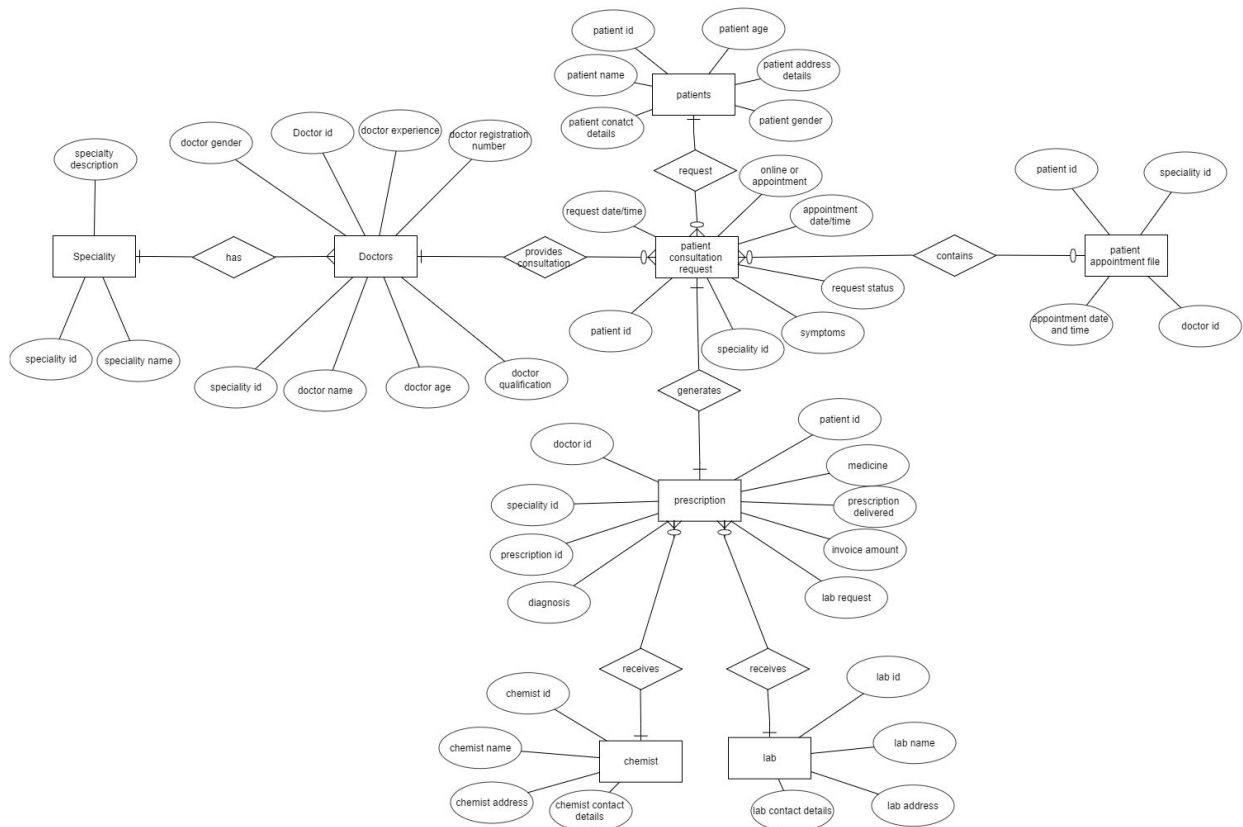
DF. ID	Data Flow	Description
D01	Specialty Details	Speciality entered by the admin get into the speciality database to create specialities present in the hospital.
D02	Doctor's Details	Details entered by the admin get into the doctor database to create an account for doctor
D03	Chemist/Lab Details	Details entered by the admin get into the admin database to create accounts for the chemist/lab
D04	Patients Details	While registering an account or while editing personal profile page, the corresponding details get added into the patient database.
D05	Consultation Request	Patient when makes a consultation request, the details entered such as symptoms, time and doctor, it gets added into the consultation request database.
D06	Diagnosis	The appointment when scheduled will take place with the details of patient, appointment request details from consultation request database, doctors details from doctors database and diagnosis will be successfully done.
D07	Medicine, Lab Request, Diagnosis	During consultation, if doctor feels the need of lab test or medicines, the corresponding entries done by doctor will be added into prescription database, other diagnosis details also get into prescription database.
D08	Lab Request	After consultation, if patient is told to do any lab test, then from the prescription database, the details are seen on lab dashboard to perform lab test.
D09	Medicine Delivery	After consultation, if any medicines are to be delivered

	Request	to the patient, the medicines to be delivered will be shown on medical shop incharge to complete the delivery.
D10	Update Medicine Delivery Status	Once the medicines are delivered, medical shop incharge updates the status in his/her system to reflect the changes in prescription database.
D11	Collect specimen	If a patient is requested to perform a lab test, he/she has to submit the specimen required for the test.
D11	Update Lab Reports	After the lab test, the reports of the test are updated by the lab incharge to view for the patient/doctor.
D12	Generate Prescription	Patient can anytime generate invoice/lab reports after the consultation is done for any future reference.

Entity Relationship Diagram

E-R diagram depicts the relationships between several entities along with their attributes that are present in the system. In Virtual Clinic there exists entities like Speciality, Doctor, Patient, Patient consultation request etc. All of them have several attributes linked to them and share different kinds of relationships with each other. It is well described in the below diagram and explained in relational model.

ER-Diagram:



List of Entities and Attributes:

ET. ID	Entity	Description	List of Attributes and type
E01	Speciality	Various specialities provided by Hospital e.g. Gastroenterology, Cardiology, ENT etc.	Speciality id(varchar) Speciality Name(varchar) Speciality Description(varchar)
E02	Doctors	A person who is qualified and authorized to treat people who are ill/ suffering from disease	Speciality Id (varchar) Doctor Id (varchar) Doctor Name (varchar) Doctor Age (numeric) Doctor Gender (char) Doctor Qualification (varchar)

			Doctor Experience (varchar) Doctor Registration Number (varchar)
E03	Patients	A person receiving or registered to receive medical treatment	Patient id (varchar) Patient Name (char) Patient Age (numeric) Patient Gender (char) Patient Contact details <ul style="list-style-type: none"> • Email-id (varchar) • telephone number (varchar) • Mobile number (numeric) Patient Address details <ul style="list-style-type: none"> • Address line 1 (varchar) • Address line 2 (varchar) • Address line 3 (varchar) • City (varchar) • Pin Code (numeric)
E04	Patient consultation requests	Requests made by patients to treat them	Online/Appointment (Char-List of Values - O/A?) Request Date (Date) Appointment date (dd/mm/yyyy) Appointment time (hh:mm) {Only for Hospital Consultation} Patient id (varchar) Speciality id (varchar) Symptoms (upto 5 lines) (varchar) Request Status (Char)
E05	Patient appointment file*	Contain patient appointment details by Doctor by date- this will be logged in by Doctors to see the appointments for the day. Patient details like Name,	Patient id (varchar) Doctor id (varchar) Appointment date and time (Date) Speciality id (varchar)

		Age etc will be picked from Patients database	
E06	Prescription	An instruction written by a medical practitioner that authorizes a patient to be issued with medicines or treatment. Also, has diagnosis of ailment and may contain lab requests, if any	Doctor id (varchar) Patient id (varchar) Speciality id (varchar) Prescription id (varchar) Diagnosis (Char) Medicines upto 8 lines <ul style="list-style-type: none"> • Medicine Name(char) • Medicine potency(numeric) • Number of times (numeric) • Number of days(numeric) • Remarks (char e.g. before dinner) Lab requests upto 5 lines <ul style="list-style-type: none"> • Lab test(char) • Instructions (char e.g. early morning before breakfast) Prescription Delivered Y/N (Char) Lab Requests Performed Y/N(Char) Invoice Amount (Numeric -float)
E07	Chemist	A shop where medicinal drugs are dispensed and sold, and in which toiletries and other medical goods can be purchased. It is assumed that there would 1 Chemist per Pincode and the Chemist will log-in every hour to Check the workflow of Prescriptions (Dynamic Workflow based on Pincode of Patient) to cater for the Closest Chemist. After dispensing Medicines the	Chemist id (varchar) Chemist name (char) Chemist address <ul style="list-style-type: none"> • Address line 1 (varchar) • Address line 2 (varchar) • Address line 3 (varchar) • City (varchar) • Pin Code (numeric) Chemist contact details <ul style="list-style-type: none"> • Email-id (varchar) • telephone number

		Chemist will close the workflow in prescription. Chemist will ONLY see medicines prescribed and the rest of fields will be masked.	(varchar) <ul style="list-style-type: none"> • Mobile number (numeric)
E08	Lab	Lab is a place where tests are usually done on clinical specimens in order to obtain information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease. It is assumed that there would 1 Lab per Pincode and the Lab personnel will log-in every day to Check the workflow of Prescriptions (Dynamic Workflow based on Pincode of Patient) to cater for the Closest Lab. After noting the requests the Lab personnel will close the workflow in the prescription. Lab personnel will only see Lab Requests fields and the rest will be masked (protect confidentiality of Patients)	Lab id (varchar) Lab name (Char) Lab address <ul style="list-style-type: none"> • Address line 1 (varchar) • Address line 2 (varchar) • Address line 3 (varchar) • City (varchar) • Pin Code (numeric) Lab contact details <ul style="list-style-type: none"> • Email-id (varchar) • telephone number (varchar) • Mobile number (numeric)

*E05 'Patient Appointment File' is being maintained to ensure that there is no need to scan thru all the records of E04 to extract the appointments within a given date region. This will improve the system performance

Relational Model :

1. Speciality (Speciality Id,speciality name,speciality description)

Speciality id	Speciality Name	Speciality Description
S01	Cardiology Speciality	Cardiology Speciality caters to all ailments related to Heart. This Speciality is headed by eminent Dr. XYZ who is recognized as the World's best heart specialist
S02	ENT Speciality	ENT Speciality caters to all ailments of Ears /

		Nose and Throats. ENT caters to all types of patients - from 0 to 70 years
S03	Gastroenterology	Gastroenterology Speciality caters to all diseases of the Digestive

Relationship - Each Speciality 'has' one or more Doctors linked to it.

2. Doctors (speciality id, doctor id, doctor name, doctor age, doctor gender, doctor experience, doctor qualification, doctor registration number)

Speciality Id	Doctor id	Doctor name	Doctor age	Doctor gender	Doctor experience	Doctor qualification	Doctor Registration Number
S01	D01	Dr. Rakesh Sharma	38 years	Male	15 years	MBBS from Father Muller College	REG010
S01	D02	Dr. Alok Bansal	45 years	Male	23 years	MD from AIIMS	AIIM12
S03	D03	Dr. Manoj Aggarwal	55 years	Male	33 years	MD from AIIMS	AIM01
S02	D04	Dr. Snehlata	30	Female	7 years	MBBS	F03
S02	D05	Dr. Mrigank Rastogi	32	Male	9 years	MBBS	F04
.....							

Relationships :

Each Doctor shall be mapped to ONE and ONLY ONE Speciality.

Each Doctor shall provide Consultation to ONE or More Patients

3. Patients (patient id, patient name, patient age, patient gender, patient contact details, patient address details)

Patient id	Patient name	Patient age	Patient gender	Patient contact details	Patient Address Details
P01	Sunil Kumar	34 years	Male	Email - abc@gmail.com Tel - 0120567890 Mobile - 9765437890	Address line 1 -xyz Address line 2 Address line 3 City - Surathkal Pincode - 575025
P02	Mohit Verma	38 years	Male	Email - abc@gmail.com Tel - 0120567890 Mobile - 9765437890983 2456908	Address line 1 -xyz Address line 2 Address line 3 City - Kalimpatta Pincode - 575023

Relationships - Each Patient has to register himself/ herself by filling Patient profile - a unique id will be generated for the Patient.

4. Patient Consultation Request (speciality id, patient id, request date/time, mode of consultation, appointment date/time, symptoms, request status)

Spec iality id	Pa tie nt id	Request Date/ Time	Mode of consultatio n	Appoint ment date/time	Symptoms (5 lines)	Request Status
S01	P02	15-01-2018, 8:00 PM	Online	-	1. Chest Pain since Morning 2. Did not sleep well 3. Vomiting Sensation	Closed

					4. 5.	
S02	P01	25-01-2018 5:00 PM	appointment	1-Feb 2018 10:00 AM	1. Suffering from cold and fever 2. Gets severe at night 3. ... 4. ... 5. ...	Open

Relationships - Each Patient can request for one or more consultation Requests (linked back to Specialty).

5. Patient Appointment file (Doctor id,specialty id,patient id,appointment date and time)

Doctor id	Specialty id	Patient id	Appointment Date and Time
D01	S01	P02	3-Feb 2018 5:30 PM
D02	S02	P01	1-Feb 2018 10:00 AM

6. Prescription(doctor id, speciality id,patient id,prescription id,diagnosis,medicine,lab request,prescription delivered,lab test perform,invoice amount)

Doctor id	Speciality id	Patient id	Prescription id	Diagnosis	Medicine X 8 lines	Lab request X 5 lines	Prescription Delivered Y/N	Lab Test Performed	Invoice Amount
D01	S01	P02	PR01	Suffered from heart	Medicine Name - Plavix	Lab Test - Echo	N	N	Rs. 500

				attack	Medicine Potency 50 Number of times - 3 Number of Days - 30 Days Remarks - only after meals	Instructi ons - After Lunch			
D02	S02	P01		Dengue fever	Medicine Name - Acetamino phen Medicine Potency -100 Number of times - 2 Number of Days - 5 Remarks - reduce if fever subsides	Lab Test - Instructi ons -	Y	-	Rs. 350

Relationships : Each Patient Consultation Request ‘Generates’ ONE prescription. Each Prescription shall be mapped to ONE AND ONLY ONE Patient Consultation Request. The Patient Consultation Request and Prescription can be mapped to 1 ENTITY at design -time.

7. Chemist (chemist id,chemist name,chemist address,chemist contact details)

Chemist id	Chemist name	Chemist address	Chemist contact details
C01	NeelKanth	Address Line 1 East Mangalore Address Line 2 Address Line 3 City - Mangalore Pincode - 575025	Email - neelkanth@gmail.com Tel - 01023432432 Mobile no - 9876549032

C02	Apollo	Address Line 1 Surathkal Address Line 2 Address Line 3 City - Mangalore Pincode - 575024	Email - ikanth@gmail.com Tel - 01023432432 Mobile no - 98704356892
-----	--------	---	--

Relationships : Each Chemist “receives” one or more prescriptions (only required fields). Each prescription is mapped to (vide workflow using Pincode) ONE and ONLY ONE Chemist. After dispensing Medicines the Chemist marks the Status in Prescription as Prescription Delivered

8. Labs(Lab id, lab name, lab address, lab contact details)

Lab id	Lab name	Lab address	Lab contact details
L01	Lal Pathlabs	Address Line 1 East Mangalore Address Line 2 Address Line 3 City - Mangalore Pincode - 575025	Email - pathl@gmail.com Tel - 01023432432 Mobile no - 9876549032
L02	Max Labs	Address Line 1 Surathkal Address Line 2 Address Line 3 City - Mangalore Pincode - 575024	Email - maxlab@gmail.com Tel - 01023432432 Mobile no - 98704356122

Relationships : Each Lab “receives” one or more prescriptions (only required fields). Each prescription is mapped to (vide workflow using Pincode) ONE and ONLY ONE Labs. After noting the lab tests the labs marks the Status in Prescription as Lab Tests performed.

The section below outlines the Use Case Diagram/ behavior diagrams for Integrated Care System. Use Cases describe a set of actions/ tasks that system should or can perform in collaboration with one or more external users of the system (actors). For each Use Case, the pre-condition and post- condition have been articulated along with Actors and the associations/ relationships (internal/ external) have been clearly stated.

```
graph TD
    subgraph "Virtual Clinic System"
        direction TB
        subgraph "Patient Use Cases"
            P1((Patient Registration))
            P2((Online/Onsite Appointment))
            P3((Update Profile Details))
            P4((View Reports/Generate bills))
        end
        subgraph "Admin Use Cases"
            A1((Setup Speciality))
            A2((Add Doctors))
            A3((Edit/Delete Doctors))
            A4((Add Labs/Chemists))
            A5((Edit/Delete Lab/ Medical Shops))
        end
        subgraph "Lab Use Cases"
            L1((Perform Lab tests))
        end
        subgraph "Pharmacy Use Cases"
            Ph1((Deliver Medicines))
        end
        subgraph "Doctor Use Cases"
            D1((Provide Consultation))
            D2((Prescribe lab tests))
            D3((Prescribe medicines))
        end
    end

    Patient --> P1
    Patient --> P2
    Patient --> P3
    Patient --> P4
    Admin --> A1
    Admin --> A2
    Admin --> A3
    Admin --> A4
    Admin --> A5
    Lab --> L1
    Pharmacy --> Ph1
    Doctor --> D1
    Doctor --> D2
    Doctor --> D3

    P1 -.-> P2
    P2 -.-> P3
    P3 -.-> P4
    A1 -.-> A2
    A2 -.-> A3
    A3 -.-> A4
    A4 -.-> A5
    A5 -.-> D1
    A5 -.-> D2
    A5 -.-> D3
    L1 -.-> Ph1
    D1 -.-> D2
    D2 -.-> D3
    D1 -.-> P4
    D2 -.-> P4
    D3 -.-> P4
```

List of Use Cases

The following section describes the Use Cases with Pre-and Post Conditions:

S.No	Use Case Name	Description	Pre-Condition	Post-Condition
UC-01	Patient Registration	Registrant will provide personal, medical and general information upon registering and become a patient	System is setup and configured System is running and open for registrations Registrant has accessed website via URL	Patient is successfully registered
UC-02	Speciality Setup	Admin will add the specialties of doctor for which the hospital will give the treatment	System is setup and configured. System is running and open for registrations Registrant has accessed website via URL. Admin account is created Default admin is logged into the system.	New Specialities will be added into the system.
UC-03	Doctor Registration	Admin will have the option to register doctors into the system.	System is setup and configured. System is running and open for registrations Registrant has accessed website via URL. Admin account is created Default admin is logged into the system.	New accounts for doctors is created via the admin account.
UC-04	Labs and Chemist Registration	Admin will have option to add labs and Chemist into the system	System is setup and configured. System is running and open for registrations Registrant has accessed website via URL. Admin account is created Default admin is logged into the system.	New accounts for labs and Chemist is created via admin account.
UC-05	Update	Admin will have the	System is setup and	Doctors profile

	Doctor Information	option to update doctors information into the system.	configured. System is running and open for registrations Registrant has accessed website via URL. Admin account is created Default admin is logged into the system. Account for Doctor is created	information will be updated via admin.
UC-06	Update Lab/Chemist Details	Admin will have option to update labs and Chemist into the system	System is setup and configured. System is running and admin has accessed website via URL. Admin account is created Default admin is logged into the system. Account for Lab/ Chemist is created	Lab/Chemist information will be successfully updated via admin.
UC-07	Update Patient Profile Information	Patient can update their personal details	System is setup and configured. System is running and patient has accessed website via URL. Patient account is created Patient is logged into the system.	Patients details will be successfully updated
UC-08	Create Appointment	Patient can create appointment to visit the doctor (future date)	System is setup and configured. System is running and patient has accessed website via URL. Patient account is created Patient is logged into the system.	Appointment is created and can be viewed in appointments tab vide Patient Appointment File
UC-09	Provide Consultation	Doctor can easily view the appointments/ consultation request pending in his list and provide consultation	System is setup and configured. System is running and doctor has accessed website via URL. Doctor account is created Doctor is logged into the	Consultation is provided by the doctor and prescription is generated.

			system.	
UC-10	Prescribe Lab Tests	Doctors while providing consultation can prescribe lab tests	System is setup and configured. System is running and doctor has accessed website via URL. Doctor account is created Doctor is logged into the system. Doctor is looking into the patient.	Lab Test for the patient is created and lab is requested to perform the lab test.
UC-11	Prescribe Medicines	Doctors while providing consultation can prescribe medicines	System is setup and configured. System is running and doctor has accessed website via URL. Doctor account is created Doctor is logged into the system. Doctor is looking into the patient	Medicines for the patient are requested to the concerned Chemist for delivery.
UC-12	Perform Lab Tests and update the reports.	Lab tests are performed and reports for corresponding patient are updated (Offline)	System is setup and configured. System is running and doctor has accessed website via URL. Lab account is created Lab incharge is logged into the system. Lab specimen for the patient is collected(offline)	Lab report for the patient is released to view (Offline)
UC-13	Deliver medicines to the patient	Medicines are delivered as prescribed by the doctor (offline)	System is setup and configured. System is running and doctor has accessed website via URL. Pharmacy account is created Chemist is logged into the system.	Successfully medicines are delivered to the patient (offline)
UC-14	View/Print Reports,	Admin, Patient can view the invoice and	System is setup and configured.	Easily invoice and

	Invoice	reports for the appointment.	System is running and doctor has accessed website via URL. Admin/Patient account is created They are logged into the system. Previous appointment is made by patient	prescription reports can be printed anytime and stored for further need.
--	---------	------------------------------	---	--

List of Actors

The following are the Stakeholders/ Actors who perform the functions/ use cases as stated above:

S. No	Actor Name	Description/ Actor's Role
01	Admin	Setup Speciality Add Doctors Add Labs/Pharmacy Edit Doctors Information (Update/ Delete) Edit Labs/Pharmacy Details (Update/ Delete)
02	Patient	Registration Update Profile Make Appointments/ Submit Online Consultation Request View/Generate Prescription Reports/Invoices
03	Doctor	Provide Consultation Prescribe Medicine Prescribe Lab Tests
04	Lab Incharge	Performs Lab test and updates the reports (offline) - Sets the flag in prescription
05	Chemist	Delivers the medicine to concerned patient (offline) - Sets the flag in prescription

List of Associations/Generalizations/Relationships (Include or Exclude)

The following section describes the Associations (include/ exclude):

S. No	Association	Type (Association or Generalization or include or exclude)	Description
01	Patient -> Patient Registration	Association	Creates an account for the patient
02	Patient -> Online/ Offline Appointment	Association Include	Creates an appointment for the patient - Includes Patient Profile information
03	Patient -> Update Profile	Association	Updates the profile of the patient.
04	Patient -> View/ Generate Reports/Invoice	Association, Include	Patient can generate the invoice/reports for the appointments done. Includes Prescription provided by the Doctor
05	Admin -> Setup Speciality	Association	Admin adds the speciality for which the hospital is going to serve.
06	Admin -> Add Doctors	Association, Include	Admin creates account for the doctors. Doctors are linked to Specialities
07	Admin -> Edit/Delete Doctors	Association, Include	Admin can edit/delete the doctor's profile information, Doctors are linked to Specialities
08	Admin -> Add Labs/Chemists	Association	Admin creates account for the labs and chemists.
09	Admin -> Edit/Delete Labs/Chemists	Association	Admin can edit/delete the lab/chemist information.
10	Admin -> View/Generate Reports/Bills	Include	Admin can generate invoices/reports for the patient.

11	Doctor -> Provide Consultation	Association	Doctor will provide consultation to the requests in their dashboard.
12	Doctor -> Prescribe Medicines	Association, include	Doctor will prescribe the medicines for the consulting patient. Prescription will be extended to include Medicines to be delivered by Chemist
13	Doctor -> Prescribe Lab Tests	Association, include	Doctor will prescribe the lab tests for the consulting patient. Prescription will be extended to include Lab tests if needed
14	Lab Incharge -> Perform Lab test	Association	Lab incharge will collect specimen and perform test and update the lab report
15	Pharmacist -> Deliver Medicine	Association	Pharmacist will deliver the medicines prescribed to the patients and update the delivery status.

Summary

“Virtual Clinic” is based on the concept of Integrated Care System. This report depicts various formal views of Integrated Care System viz. Data Flow Diagrams, Entity Relationship Diagrams and Use Case Diagrams.

In the initial section, Context Diagram (Zeroth level Data Flow Diagram) and 1st Level data flow diagrams which show a graphical representation of the "flow" of data through the Integrated Care System, modelling its process aspects have been depicted.. The reports also contains descriptions for each process and data flow.

In the next section, the report depicts the Entities and their relationships vide. E-R Diagram and Relational Model. Further, all entities and their attributes have been defined. Finally, the report depicts the Use Case Diagram/ behavior diagrams with detailed Use Cases (atomic functions). Use Cases describe a set of actions/ tasks that system should or can perform in collaboration with one or more external users of the system (actors). For each Use Case, the pre- condition and post- condition have been articulated along with Actors and the associations/ relationships (internal/ external) have been clearly stated.