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Section: BCS 5-A

Hospital Management System

Case Study - Hospital Management System

1. Actors:

- a. Patient
- b. Doctor
- c. Nurse
- d. Receptionist
- e. Lab Assistant
- f. Pharmacist
- g. Cashier

2. Functional Requirements:

- a. The system will have a patient registration form. This form will contain all the necessary data about the patient like their name, e-mail, gender, username, hashed password etc. All this data will be saved in a database.
- b. Registered patients can login into the application via login module using the username and password stored in the database.
- c. Unregistered patients can use the system to view general information about the hospital like the address, hospital timings etc.
- d. Registered patients when logged in, are able to access allowed functionalities for patients (mentioned in the upcoming points).
- e. Patients are able to manage their profiles and perform activities like viewing their appointments, booking new appointments, viewing prescriptions and test reports etc. Booked appointment details will be updated to the patient's account.
- f. Receptionist can view the appointment lists of patients. Allowing them to issue a clinic number for the patient when they visit the hospital. The clinic number is updated to the

patient's account.

g. Receptionist can also create new accounts and book appointments for unregistered patients that visit the hospital.

h. Nurses can allot patients for the concerned doctors, view doctor's status and update patient's account using their respective modules.

i. Doctors can view their patients' examinations done by the nurse (from patient account). In case of any further examinations, the doctor can redirect the patient back to the nurse using the system.

j. Lab assistants can perform tests on the specimen received from the nurse or any tests requested directly by the doctor like X-Ray images, CT scan, MRI etc. They can generate a test report which is saved to the patient account and can be examined by the doctor as well as the patient.

k. Doctors using any available test results and the pre-assessment examinations from the patient account can enter a prescription for the patient or recommend any further actions if required.

l. When a prescription is generated by the doctor, the pharmacist can use this prescription (present in the patient account) to prepare the medicines and enter their doses and guidelines into the system which is updated into the patient account.

m. Patients can view their prescription details and doctor's comments by accessing their accounts. They can also view the medicine details that were entered by the pharmacist at any time as all this information is saved to the patient account.

n. Cashier can use the information present in the patient account to generate bill and send invoice details to the patient.

o. Cashier also has the access to the payment history of the patients.

3. Non-functional Requirements:

a. Compatibility of the mobile app with different Operating Systems, hardware and external software.

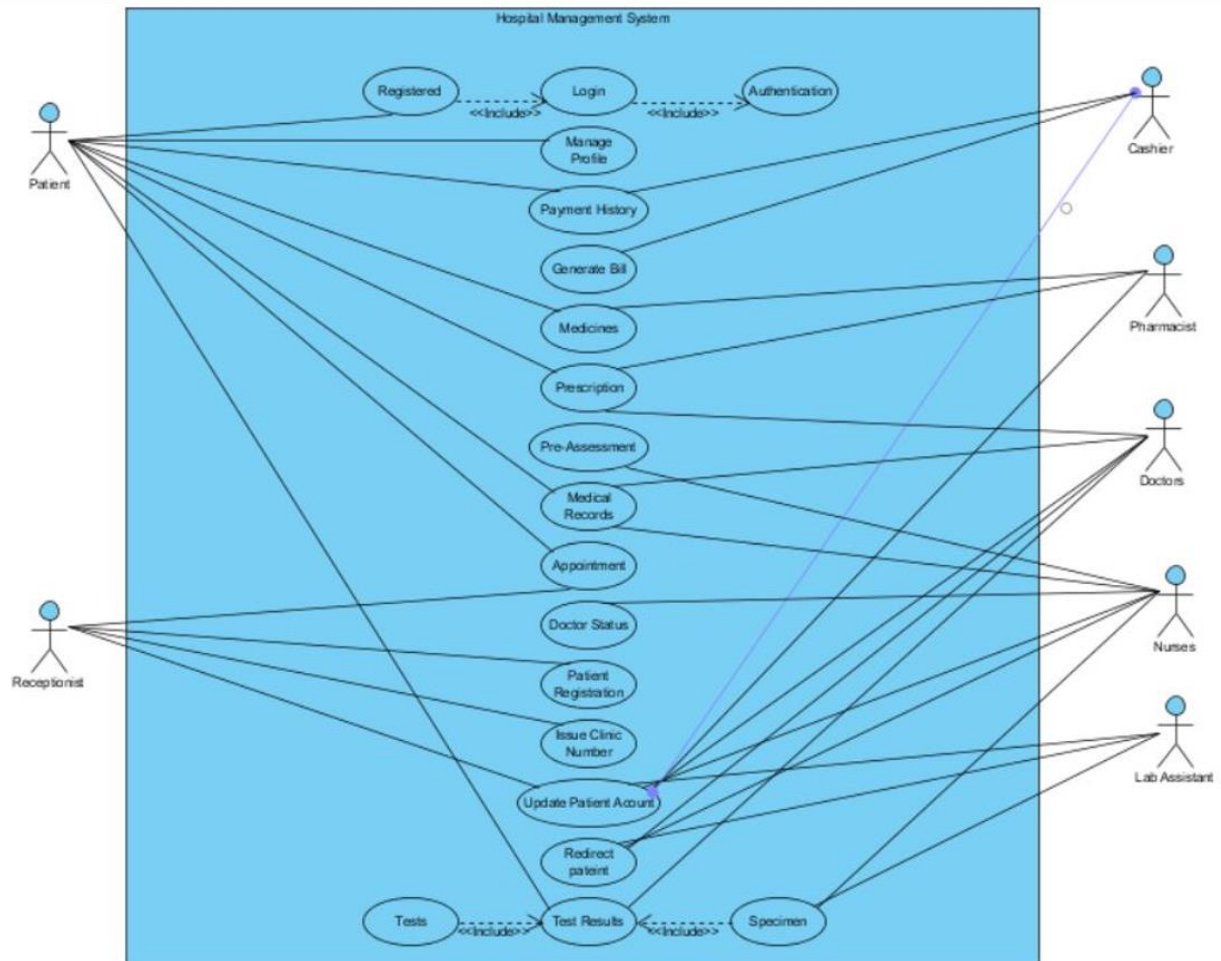
b. Web application should be compatible with all the popular web browsers.

c. Performance and the number of users a server can hold should be high to avoid any server downtime as any time lost could be critical to a patient's health.

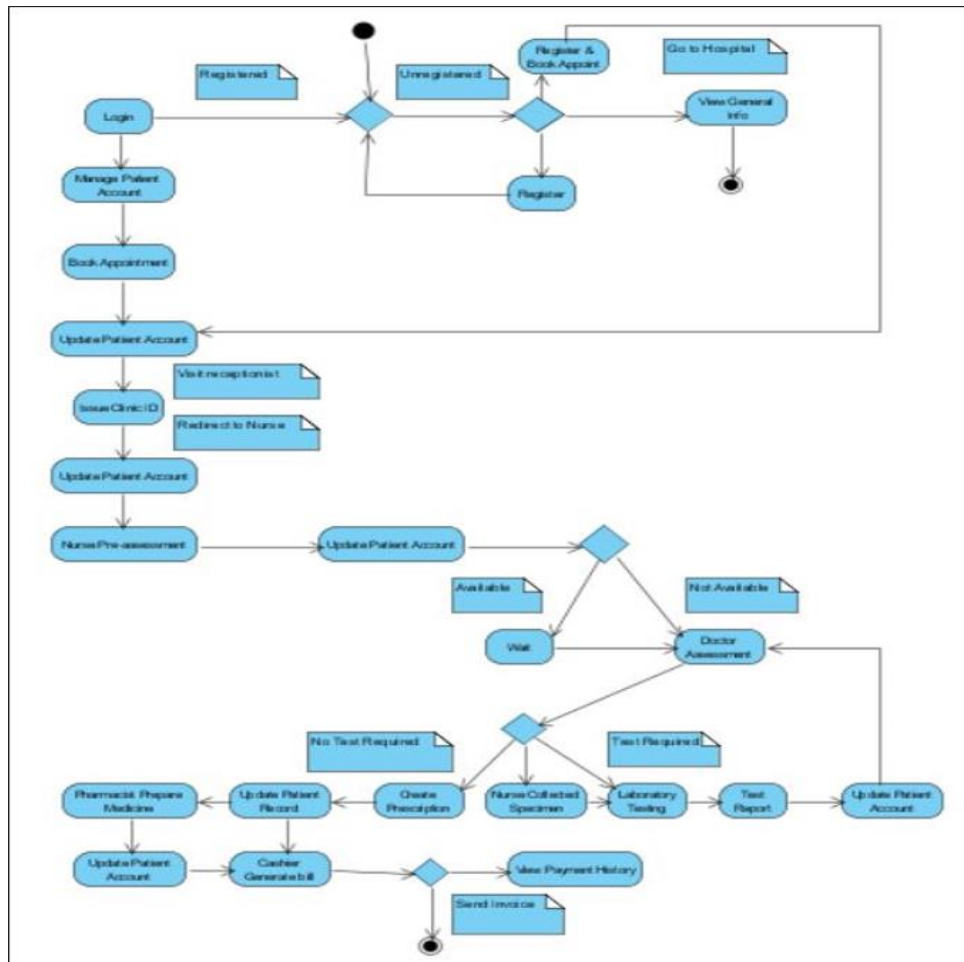
d. Accessibility within the application for the disabled (color blind, handicap etc.).

e. Sensitive information of patients should be well protected from specific threats such as 'Injection', as the system heavily relies on its database.

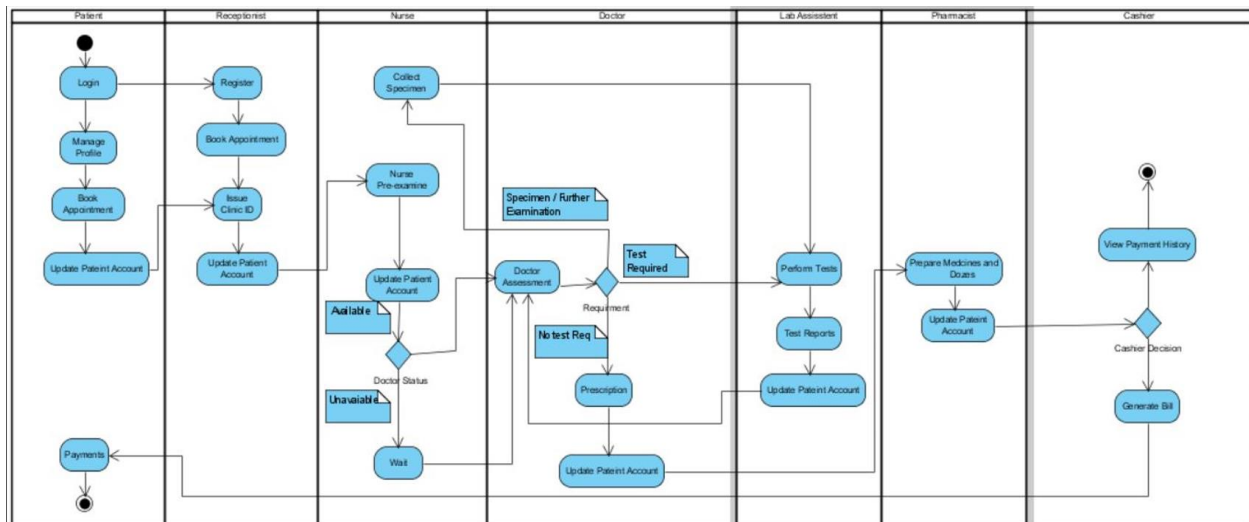
4. Use Case Diagram:



5. Activity Diagram:



6: Swim Lane Diagram:



Class Diagram:

1. Identified Classes:

Note: Abstract classes will be written in *italic*.

Classes Identified				
<i>Person</i>	<i>Staff</i>	Login Info	Patient	Nurse
Doctor	Lab Assistant	Cashier	Examination	Receptionist
Pharmacist	Medical Record	Appointment	Prescription	Medicine
Test Report	Test	Invoice Bill	Bill Item	

2. Associations:

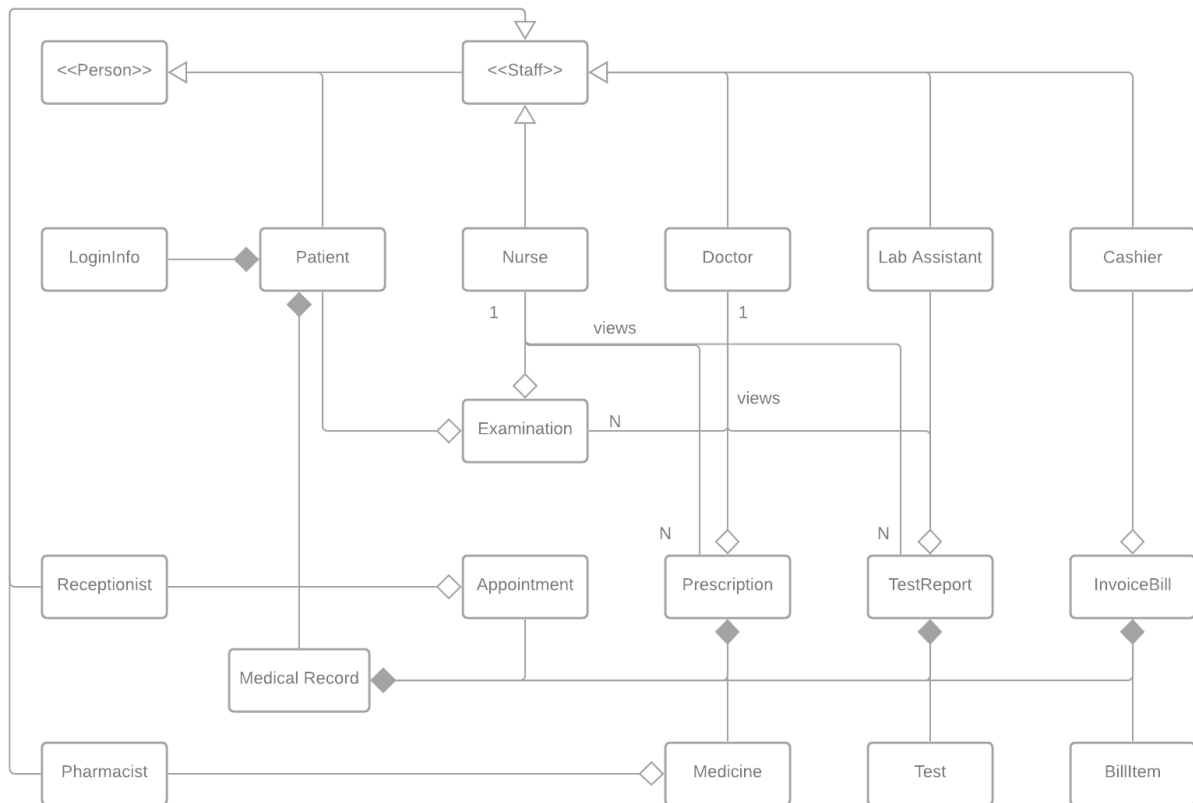


fig 1.0

3. Final Class Diagram:

Note: Setters and getters are assumed.

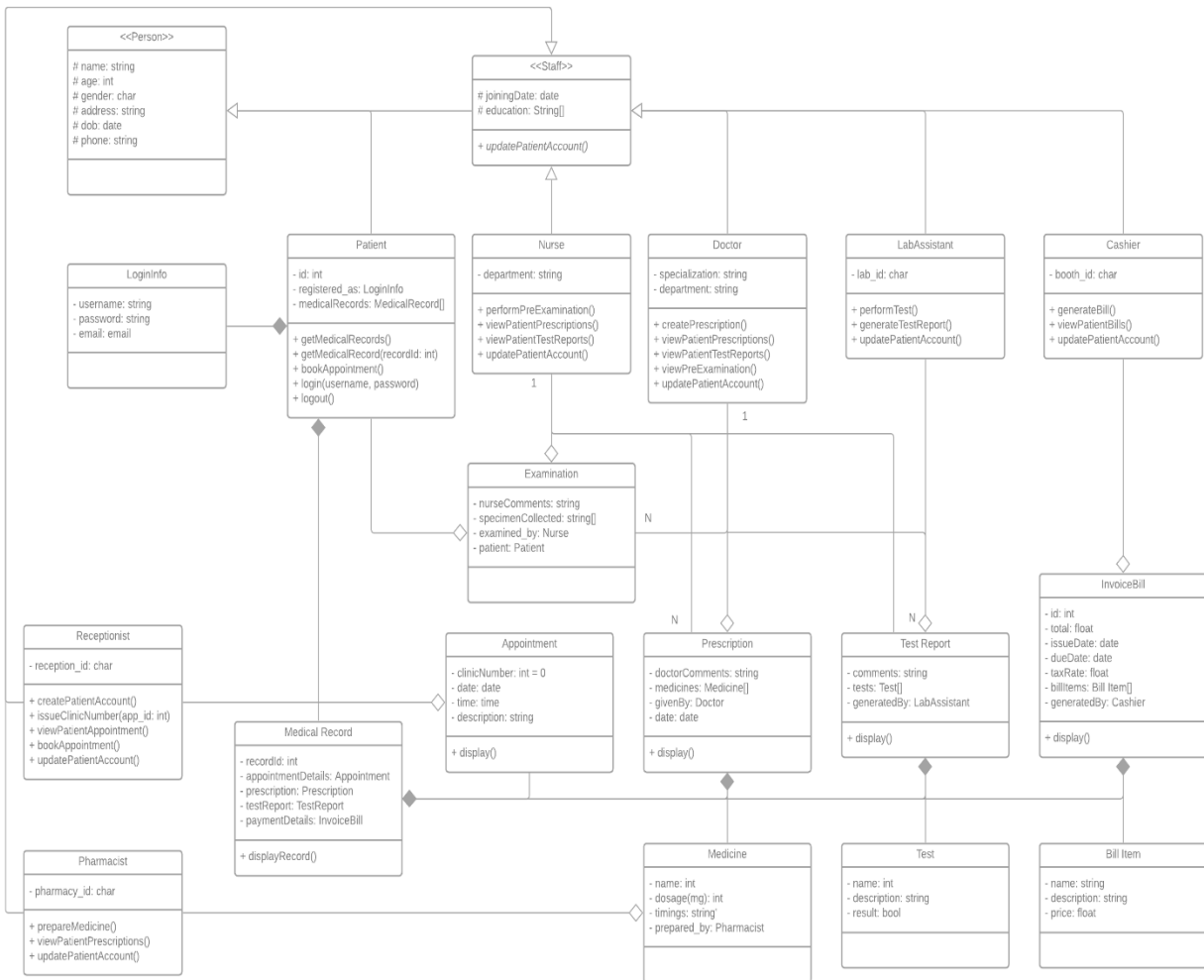


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Technologies:

- React.js
- Express.js
- Node.js
- Mongo DB

Interface:



WELCOME TO THE HOSPITAL MANAGEMENT SYSTEM

Opening Hours

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Timings	8:00 AM - 2:30 PM	8:00 AM - 2:30 PM	8:00 AM - 2:30 PM	8:00 AM - 2:30 PM	8:00 AM - 2:30 PM	8:00 AM - 2:30 PM	Closed

[REGISTER NOW](#)


Flow:

- Patients first register on the system. Once registered, they are able to log in to their accounts. Patient dashboard can be used to book and view all appointments. Also, medical record history is available for the Patient to view.
- Staff Login is used to log in any staff member of the hospital. (Doctor, Lab Assistant, Pharmacist, Nurse, Receptionist, Cashier).
- Each staff member has their own view of their dashboard which can be used by them to update patient information.
- Receptionists are able to view appointments and can assign clinic numbers to patients that visit the hospital.
- Doctors can assign/update prescriptions. Also, can view patient prescription history.
- Lab assistants can generate test reports and add test results to patient account. Also, can view patient Test history.
- Pharmacist can add medicines and their dosages that are mentioned by the Doctor in the prescription.
- Cashier can generate invoice bills for patients. Also, can view patient payment history.

Functionalities:

Register:

New user need to register to access the respective dashboard.



Sign up

Full Name *

Shaheer Sarfraz

Email Address *

au1998887@gmail.com

Password *


Address *

House#183 st#4 sector f5 phase 6 hayatabad

Phone *

0301 881 1345

01/26/2022



Age *

20

Male


SIGN UP

[Already have an account? Log In](#)

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Login:


A person not registered will not be able log in.



H M S

LOG IN

REGISTER



Patient Login

Email Address *

au1998887@gmail.com

Password *

LOG IN

[Don't have an account? Sign Up](#)


SWITCH TO STAFF LOGIN

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Patient Dashboard:


Separate dashboard for patient containing following functionalities


- Profile
- Book Appointment
- Medical Record
- Appointment list


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DASHBOARDLOG OUT

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 Profile

 Book Appointment

 View Appointments


 Medical Record

Profile




Name: Shaheer Sarfraz
Email: au1998887@gmail.com


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 Profile

 Book Appointment

 View Appointments

 Medical Record

Medical Record

			Record ID
^			1

Appointment Details


Clinic Number	Date	Description
1	2022-01-07T07:54:00.000Z	Appointment for chest pain

Prescription Details

Doctor Comment	Given By	Date
Panadol 3 times a day	Doctor	2022-01-04T08:01:26.065Z


Test Reports Details


Comments	Generated By
Covid Test	Lab Assistant


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DASHBOARDLOG OUT

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
 Profile

 Book Appointment

 View Appointments

 Medical Record

Book Appointment

Select Timing *
mm/dd/yyyy --:-- --

Please select suitable timings


Description *
What's the appointment regarding

BOOK


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Staff Dashboard:

Contains seperate panel for respective staff.

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LOG INREGISTER



Staff Login

Email Address *
doctor@gmail.com

Password *

LOG IN

Don't have an account? Sign Up

SWITCH TO PATIENT LOGIN

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Profile

Doctor

Doctor Portal

Patient Email Address *

hassamuddin.ail@gmail.com

SEARCH

Record Id	Date	Doctor Comments	Given By	Medicines	Edit
61d3fd55a5c5929aecccff4d	Tue Jan 04 2022	Panadol 3 times a day	Doctor	Panadol,	EDIT

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